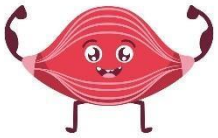
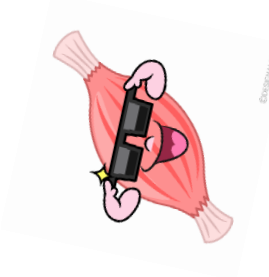
ملزمة مادة احياء

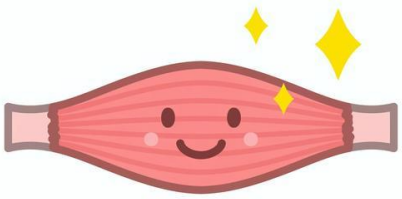


مدارس المتميزين – ثنائية اللغة

Muscular System



اعداد الاستاذة : اسراء الدباغ



Muscle are part of movement system, Muscle and bone give the body specific shape, There are nearly600 muscle in human body(فراغ او اختيار في الوزاري)

Movement system = muscles + bones

العضلات جزء من جهاز الحركة، وتعمل العضلات والعظام معًا لإعطاء الجسم شكله المميز، ويوجد حوالي 600 عضلة في جسم الإنسان.

The size and shapes of muscles are differed according to their function

يختلف حجم وشكل العضلات تبعًا لوظيفتها.

Stomach معدة

Intestine امعاء

Cardiac قلبية

Q :What are the functions of muscles?

Muscles give the outer shape of the body.

Help to perform different movements.

Some of them are responsible for internal body movement such as stomach, intestine and cardiac muscles

س: ما هي وظائف العضلات؟
تُعطي العضلات الشكل الخارجي للجسم، وتساعد على أداء الحركات المختلفة. وبعضها مسؤول عن الحركات الداخلية للجسم مثل عضلات المعدة والأمعاء والقلب.

Muscle consists of special tissue known as muscular tissue, this tissue consists of muscle fiber and theycharacterized by contraction and relaxation

تتكون العضلة من نسيج خاص يُعرف بالنسيج العضلي، ويتكون هذا النسيج من ألياف عضلية تتميّز بقدرتها على الانقباض والانبساط.

Some muscles are connected with skeleton (why)?

because of this connection muscles help to performtotal or partial body movement

DEFINE

Muscle fibers: special cells found in muscular tissue and characterized by contraction and relaxation.

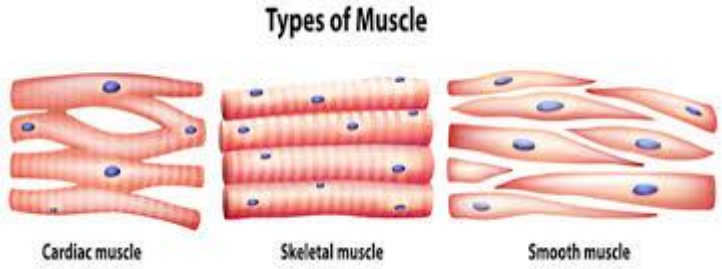
There are three types of muscles in human body:

1- **Skeletal muscle**
2- **Smooth muscles**
3- Cardiac muscles

الألياف العضلية: هي خلايا خاصة توجد في النسيج العضلي، وتتميّز بقدرتها على الانقباض والانبساط.

يوجد في جسم الإنسان ثلاثة أنواع من العضلات:

1-العضلات الهيكلية
2-العضلات الملساء
3-العضلات القلبية



Skeletal muscles

Theses muscle connected with the bony skeleton are responsible the body movement. When your arm is flexed from the elbow you feel a big muscle located on the front upper part of the arm at this moment muscle enlarged because of constriction, when your arm is stretched it became longitudinal and pointed,these two conditions shows that muscles are under our controls this called as (voluntary muscles) (عضلات ارادية)

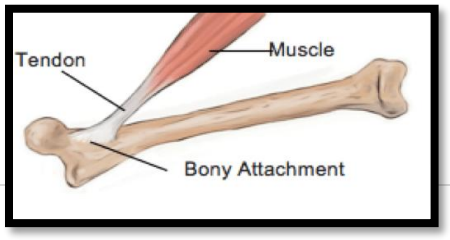
They consist of many cells called (muscle fibers) they are elongated cells and they lie length wise along the line of muscle contraction

Length wise من حيث الطول

Each cell (fiber) contains bright and dark sections alternatively. this structure gives the cell (and consequently the muscle) straited form when it is examined under the microscope for this reason it is called straited muscles.

The muscle fiber contains more than one nucleus which is not located in the centre.

End of each muscle are connected with tough cord called (tendon) these tendons join the muscles to the parts of bony skeleton. The connection of the muscles in this form provides the human to move the parts which are attached to these muscles.



العضلات الهيكلية:
هذه العضلات متصلة بالهيكل العظمي، وهي المسؤولة عن حركة الجسم.
عند ثني الذراع من عند المرفق، تشعر بوجود عضلة كبيرة تقع في الجزء العلوي الأمامي من الذراع، وفي هذه اللحظة تتضخم العضلة بسبب انقباضها، وعندما تمد ذراعك تصبح العضلة طويلة ومشدودة.
هاتان الحالتان تُظهران أن العضلات تقع تحت سيطرتنا الإرادية، ولذلك تُسمى **العضلات الإرادية**.**(Voluntary Muscles)**

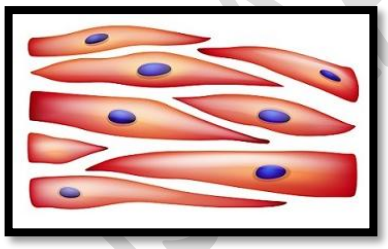
تتكون هذه العضلات من العديد من الخلايا تُسمى **الألياف العضلية**، وهي خلايا ممدودة تمتد على طول خط انقباض العضلة.
كل خلية (ألياف) تحتوي على مناطق فاتحة وأخرى داكنة بشكل متبادل، وهذا التركيب يمنح الخلية — وبالتالي العضلة — مظهراً مخططاً عند فحصها تحت المجهر، ولهذا السبب تُسمى **العضلات المخططة**.**(Striated Muscles)**

تحتوي الألياف العضلية على أكثر من نواة واحدة.
وينتهي كل طرف من العضلة بحبل قوي يُعرف باسم **الوتر(Tendon)** ، وتعمل هذه الأوتار على ربط العضلات بأجزاء الهيكل العظمي.
هذا الارتباط بين العضلات والعظام هو ما يُمكّن الإنسان من تحريك أجزاء جسمه المتصلة بهذه العضلات.

Smooth Muscles

These muscles found in the walls of the internal organs, such as muscular tissue of the bladder, intestine, stomach and uterus
Stomach works by contraction and relaxation of these muscles' food digestion
Stomach wall contain a group of muscles which are not controlled by us for this reason these muscles called (involuntary muscles)

This type of muscle (smooth muscle) found in structure of internal organ also found in structure of circulatory system except heart
smooth muscle consists of cells (muscle fibers) which are spindle shaped, these contain 1 nucleus located in the centre of muscle cell
These cells have not bright and dark sections, for this reason they are called smooth muscles.



Bladder مثانة

Uterus رحم

العضلات الملساء:
توجد هذه العضلات في جدران الأعضاء الداخلية مثل النسيج العضلي للمثانة والأمعاء والمعدة والرحم.
تعمل المعدة من خلال انقباض وانبساط هذه العضلات، مما يساعد على **هضم الطعام**.
تحتوي جدران المعدة على مجموعة من العضلات **التي لا تخضع لإرادتنا**، ولهذا السبب تُسمى هذه العضلات **العضلات غير الإرادية**.**(Involuntary Muscles)**

يوجد هذا النوع من العضلات (العضلات الملساء) في تركيب الأعضاء الداخلية، وكذلك في تركيب **الجهاز الدوري** ما عدا القلب.

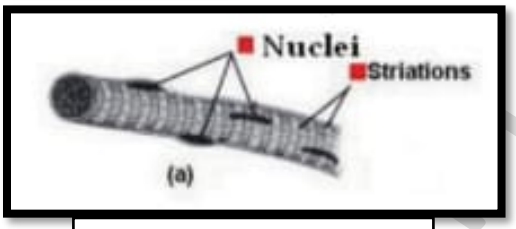
تتكون العضلة الملساء من خلايا تُعرف بـ **الألياف العضلية**، وهي خلايا **مغزلية الشكل** تحتوي على **نواة واحدة تقع في مركز الخلية العضلية**.
ولا تحتوي هذه الخلايا على مناطق فاتحة وأخرى داكنة، ولهذا السبب تُسمى **العضلات الملساء**.**(Smooth Muscles)**

Cardiac Muscles

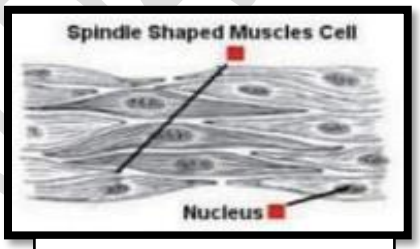
These muscles found in the walls of the heart and they are involuntary muscles, it's not under our control
There cells are striped, short and branched into other branches which connect to each other
These cells contain one nucleus located in the center of muscle but sometime two nuclei may be found.

العضلات القلبية:
توجد هذه العضلات في جدران القلب، وهي عضلات لا إرادية أي **أنها لا تخضع لإرادتنا.**
خلاياها مخططة وقصيرة **ومتفرعة إلى تفرعات أخرى** تتصل ببعضها البعض.
تحتوي الخلية العضلية القلبية على نواة واحدة تقع في مركز الخلية، **وأحيانًا قد تحتوي على** نواتين.

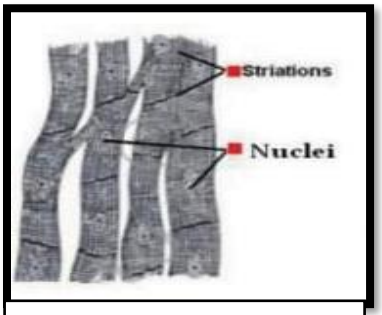
Draw and Label



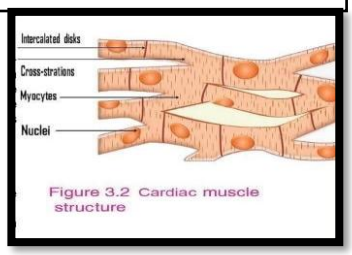
Skeletal muscles



Smooth muscles



Cardiac muscles



Q : Compare between skeletal, smooth and cardiac muscles.

Skeletal muscles	Smooth muscles	Cardiac muscles
1. Voluntary muscles.	1. Involuntary muscles.	1. Involuntary muscles.
2. Striated muscles. They have dark and bright sections	2. Non – striated muscles.	2. Striated muscles.

3. Connected with the bony skeleton.	**3. Found in the walls of the internal organs like the muscular tissue of the bladder, intestines, stomach and uterus.**	**3. Found in the wall of the heart.**
4. Consist of elongated cells.	**4. Consist of spindle shaped cells.**	**4. Consist of striped, short and branched cells.**
5. Each cell contains more than one nucleus.	**5. Each cell contains only on nucleus.**	**5. Each cell contains only one nucleus.**
6. The nucleus is not in the center of the cell.	**6. The nucleus is located in the center of cell.**	**6. The nucleus is located in the center of cell. Or two nuclei.**

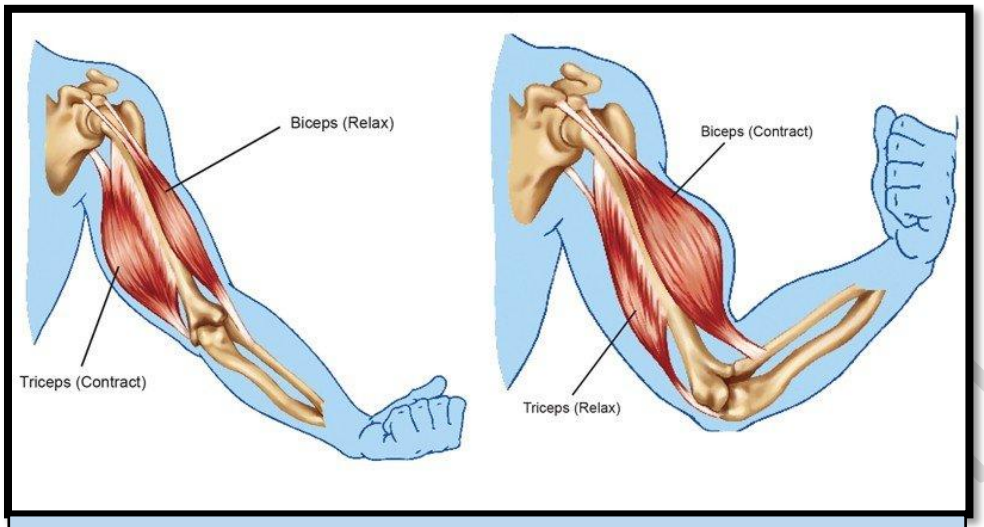
Q :Write the cause :

1- <u>The cardiac muscles and the skeletal muscles are called as striated muscles.</u>
Because Each cell (fiber) contains bright and dark sections. This structure gives the cell striated form when it is examined under the microscope

2- <u>The smooth muscles called involuntary muscles</u>
Because we have no control on their movements

Muscular Contraction and Relaxation

biceps	triceps
located in the front of the humerus	located behind the humerus
When the arm bends through the humerus, thebicep muscle contracts	When arm relaxes, triceps muscle contractand the arm goes-away from the humerus
The biceps muscle is contractor	the triceps muscle is relaxer



الصورة للتوضيح فقط

Antagonistic: When a muscle contracts, the other relaxes, like the biceps muscle is a contractor while the triceps muscle is a relaxer. The functions of these two muscles are Antagonist.

العضلات المتضادة:(Antagonistic)
عندما تنقبض عضلة، تسترخي الأخرى. مثلًا، **عضلة ذات الرأسين (Biceps)** هي المنقبضة، بينما **عضلة ثلاثية الرؤوس (Triceps)** هي المسترخية.
وظائف هاتين العضلتين **متضادة(Antagonist)** ، أي تعملان بشكل عكسي لتحقيق الحركة.

Another relaxer muscles

when it contracts the leg straightens in the same line of thigh

there are muscle called (adductor muscle) which are close to body mid line,
when it contract arm became closer to the trunk there are abductor muscle which works opposite the closer muscles such as deltoid muscle which surrounds the shoulder
there are (Round muscles) which lie obliquely on the neck.

عضلة باسطة اخرى :

عند انقباضها، **تستقيم الساق في نفس خط الفخذ.**

هناك عضلات تُسمى **عضلات المقرب (Adductor Muscles)** تقع قريبة من خط منتصف الجسم، وعند انقباضها تقترب الذراع من الجذع.

ويوجد **عضلات البعيد (Abductor Muscles)** التي تعمل عكس العضلات المقربة، مثل **عضلة الدالية (Deltoid Muscle)** التي تحيط بالكتف.

كما توجد **العضلات المستديرة (Round Muscles)** التي تمتد بشكل مائل على الرقبة

العضلة المقربةAdductor	**العضلة المبعدةAbductor**
They are close to body mid line قريبة من خط منتصف الجسم	**Like the deltoid muscle which surrounds the shoulder** مثل عضلة الدالية التي تحيط بالكتف
when it contracts arm became closer to the trunk قرب الذراع من الجذع تعمل عكس العضلات البعيدة	**opposite the closer muscle or when it contracts the arm moves- away from the trunk** تحرك الذراع بعيدًا عن الجذع تعمل عكس العضلات المقربة

Muscle's name	**Location**
Biceps	**located in the front of the humerus**
Triceps	**located behind the humerus**
Round muscle	**It is lie obliquely on the neck**
Deltoid muscle	**It surrounds the shoulder**

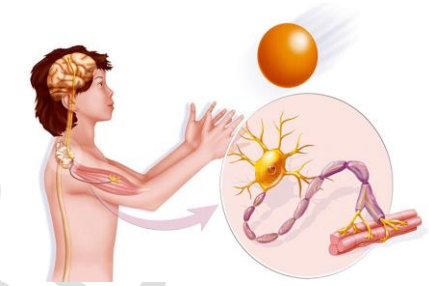
The heartbeats and food movements through the digestive tract (stomach ,intestine) , are the examples of movement which is resulted by the contraction and relaxation of muscles which are found in the walls of these organs . this operation produces a pressure or a movement on the materials located inside these cavities and this movement pushes the materials into other parts gradually.

Muscles receive impulses from nervous system in order to contract and relax, brain sends electrical impulse to muscles via spinal nerve and peripheral nervous system, muscle start to contract and relax depend on impulses from the central nervous system.

ضربات القلب وحركة الطعام عبر الجهاز الهضمي (المعدة، الأمعاء) هي أمثلة على الحركات الناتجة عن **انقباض وانبساط العضلات** الموجودة في جدران هذه الأعضاء.

هذا الانقباض والانبساط يولّد **ضغطًا أو حركة على المواد** الموجودة داخل هذه التجاويف، وتدفع هذه الحركة المواد تدريجيًا إلى أجزاء أخرى.

تستقبل العضلات **نبضات من الجهاز العصبي** لتتمكن من الانقباض والانبساط. يرسل الدماغ **نبضة كهربائية إلى العضلات عبر الأعصاب الشوكية والجهاز العصبي المحيطي**، فتبدأ العضلة بالانقباض والانبساط اعتمادًا على الإشارات الواردة من **الجهاز العصبي المركزي**.



Q:Write the function of the tendon:

these tendons join the muscles to the parts of bony skeleton

Which is responsible for:

the arm goes-away from the humerus	**Triceps**
the arm bends through the humerus	**Biceps**
The arm became closer to the trunk	**Adductor muscle**

Q :What are the scientific concepts of the following?

1- **The muscle which lie obliquely on the neck**

The round muscle

Muscle fatigue

The muscle cannot work continuously without stopping, only for limited period
But if it forced then muscle show weakness in its ability to contraction and relaxation it became harder to move this is known as (muscle fatigue)

Glucose + O2 ⟶ CO2 + H2O + Energy + Lactic acid

Q : What are the causes of the muscles fatigue?

1. **Nutritional deficiency in the muscles.**
2. **Accumulation of toxic waste – materials in the muscles.**
3. **Weakness of nervous system.**
4. **Hunger, insomnia and poor ventilation.**

لا تستطيع العضلة العمل **بشكل مستمر دون توقف**، وإنما لفترة محدودة فقط.
ولكن إذا **أجبرت على العمل لفترة طويلة**، تظهر عليها **ضعف في قدرتها على الانقباض والانبساط**، ويصبح من الصعب تحريكها. ويُعرف هذا باسم **إرهاق العضلات.(Muscle Fatigue)**

المعادلة الكيميائية لتخزين الطاقة في العضلة:

$Glucose + O_2 \rightarrow CO_2 + H_2O +$ الطاقة + حمض اللاكتيك

س: ما هي أسباب **إرهاق العضلات؟**

1. نقص العناصر الغذائية في العضلات.
2. تراكم المواد السامة في العضلات.
3. ضعف الجهاز العصبي.
4. الجوع، الأرق، وسوء التهوية

prevention

1. **You should stop working**
2. **Provide enough time to relaxation, this help the body to discharge the accumulated toxic materials from the muscles to repair the damage in the cell and also store nutrients which are necessary for working of muscles**

الوقاية من إرهاق العضلات:

1. يجب **التوقف عن العمل** عند الشعور بالإرهاق.
2. **توفير وقت كافٍ للراحة والاسترخاء**، فهذا يساعد الجسم على التخلص من **المواد السامة المتراكمة في العضلات**، وإصلاح التلف في الخلايا، وكذلك تخزين **العناصر الغذائية الضرورية** لعمل العضلات.

الاسئلة الوزارية

1- **Define: muscle fatigue -muscle fiber -involuntary muscle -voluntary muscle -tendon**
2- **What are the differences between :(skeletal muscles and smooth muscles((action -shape of musclefiber -location)**
3- **Who is responsible for each of the following:**
   1-Muscle when it contracts the arm become closer to the trunk.
   2-The arm moves towards the humerus .
4- **Write the location of the following (round muscle)(triceps muscle - smooth muscles)**
5- **Write the function of (tendon – biceps muscle)**
6- **What are the differences between skeletal muscles and smooth muscles .**
7- **What are the causes of the following :**
   1- **Skeletal muscle also known as voluntary muscle**
   2- **Write the causes of muscle fatigue.**
8- **Fill in the blanks correctly:**

The number of muscles in human body is:

a-500

b-700

c-600

8-what are the differences between (skeletal muscles and cardiac muscles) (location -action -location of the nucleus)

9- give one example for the following :Contractor muscle

Answers

1-Define:

Muscle fatigue: the weakness of muscle for ability to contraction and relaxation so it becomes harder in case of forcing muscle to work continuously without stopping (only limited period)

Muscle fibers :they are specialized cells form the muscular tissue and they are characterized bycontraction and relaxation .

Involuntary muscle: type of muscles which are not controlled by us (we have no control on theirmovements).(smooth and cardiac muscles)

voluntary muscle: type of muscles which are under our control.(skeletal muscles)

tendon: a tough cord joins the muscles to the parts of bony skeleton and each skeletal muscleconnected to it .

2-What are the differences between :(skeletal muscles and smooth muscles((action -shape of muscle fiber -location)

	Skeletal muscles	Smooth muscles
Action	Voluntary muscles	Involuntary muscles
Shape	Cylindrical cells	Spindle cells
Location	They are connected to the bones	Found in the wall of digestive tract

3-Who is responsible for each of the following:

Adductor muscles•

The biceps muscle•

4-Write the location of the following (round muscle)(triceps muscle)

Round muscle :On the neck (lie obliquely on the neck)Triceps : Located behind the humerus

Smooth muscles :in the walls of internal organs

5-Write the function of (tendon)

Tendon: connect muscles with bones

Biceps muscle: it's the contractor or when it contracts the muscles moves toward the humerus

6-What are the differences between skeletal muscles and smooth muscles .

في الملزمة

7-What are the causes of the following :

1-these muscles are under our control, for this reason we call them voluntary muscles

2-The muscle fatigue may be caused;

1- **Nutritional deficiency in the muscles.**
2- **Accumulation of toxic waste – materials in the muscles.**
3- **Weakness of nervous system.**
4- **Hunger, insomnia and poor ventilation**

8-Fill in the blanks correctly

1- **The number of muscles in human body is …600…….. muscles.**
2- **The skeletal muscles are the muscles connected with …bonny skeleton……and responsible for ……movement……..**
3- **There are three types of muscles in human body which are ……cardiac……, …smooth…… and …skeletal…..muscle.**

9- 600

10- what are the differences between (skeletal muscles and cardiac muscles) (location -action -location of the nucleus)

	Skeletal muscles	Cardiac muscles
location	Connected to boney skeleton by tendons	In the walls of the heart
Action	Voluntary	Involuntary
Location of the nucleus	contain more than one nucleus which is not locatedin the center of muscle	contain one nucleus locatedin the center of muscle but sometime two nuclei

11- give one example for the following:

Contractor muscle : biceps

Chapter -3 Review

1-Define the followings terms:

Terms	Definition
Muscle fiber	they are specialized cells form the muscular tissue and they are characterized by contraction and relaxation .
Muscle fatigue	The muscles cannot work continuously without stop, only for limited period. But if it is forced, the muscle shows weakness in their ability to contraction and relaxation. So it becomes harder and this is called as muscle fatigue.
Involuntary muscle	This type of muscles which are not controlled by us (we have no control on their movements).such as smooth muscles and cardiac muscles
Voluntary muscle	This type of muscles which are under the control of will. Like skeletal muscles

Q2-Draw the followings and write the names of the parts:

a. Longitudinal section of a smooth muscle
b. Longitudinal section of a cardiac muscle
c. Longitudinal section of a skeletal muscle

Q3-Explain the followings

The cardiac muscle and the skeletal muscles are called as straited muscles

Because Each cell contains bright and dark sections alternatively. This structure gives the cell a striated form when it is examined under the microscope. For this reason, they are called striated muscles

The smooth muscles called involuntary

Because we cannot control their movements. They are not under the control of the will and they are found in the structures of the internal organs.

Q4-Fill in the blanks with correct terms

1- The number of muscles in human body is …600…….. muscles.
2- The skeletal muscles are the muscles connected with …bonny skeleton……and responsible

for ……movement……

3- There are three types of muscles in human body which are ……cardiac……, …smooth….. and …skeletal…..muscle.

Q-5Write the function of the followings

Terms	Location
Biceps	In front of the humerus
Triceps	Behind the humerus
Round muscle	In the neck (which lie obliquely on the neck)
Smooth muscle	In the walls of internal organs

Q6-answer the followings

جميع الاجابات في الملزمة

7- give some examples for voluntary and involuntary muscles .

Voluntary :skeletal muscles (biceps –triceps- deltoid

Involuntary muscles (smooth :in the internal organs such as stomach , bladder ,intestine ,uterus etc.)-cardiac muscles (found in the walls of heart)

Muscular System Assessment

1. How many muscles are there in the human body?
A. 500 muscles
B. 550 muscles
C. 600 muscles
D. 700 muscles

2. Which characteristic is unique to skeletal muscles?
A. They are involuntary muscles
B. They are controlled voluntarily
C. They have smooth fibers
D. They are found in internal organs

3. What connects skeletal muscles to bones?
A. Ligaments
B. Cartilage
C. Tendons
D. Muscle fibers

4. Where are smooth muscles typically found?
A. In the heart
B. Attached to bones
C. In internal organs
D. In facial expressions

5. What is the main characteristic of cardiac muscle cells?
A. They are spindle-shaped
B. They are branched and striated
C. They lack nuclei
D. They are completely smooth

6. What causes muscle fatigue?
A. Excess oxygen
B. Too much rest
C. Toxic waste accumulation
D. Over-hydration

7. Which muscle pair works antagonistically in the upper arm?
A. Deltoid and triceps
B. Biceps and deltoid
C. Biceps and triceps
D. Triceps and rotator cuff

8. Where is the biceps muscle located?
A. Behind the humerus
B. In the front of the humerus
C. In the lower leg
D. In the neck

9. What type of muscle is found in the stomach wall?
A. Skeletal muscle
B. Cardiac muscle
C. Smooth muscle
D. Striated muscle

10. How many nuclei do skeletal muscle cells typically have?
A. Zero
B. One
C. Multiple
D. Two only

11. What happens when the adductor muscle contracts?
A. The arm moves away from the body
B. The arm moves closer to the body
C. The leg straightens
D. The neck rotates

12. Which system sends signals to muscles to contract?
A. Digestive system
B. Respiratory system
C. Nervous system
D. Endocrine system

13. What is a characteristic of smooth muscle fibers?
A. They are striated
B. They are spindle-shaped
C. They have multiple nuclei
D. They are voluntary

14. Where are round muscles located?
A. In the legs
B. In the arms
C. Obliquely on the neck
D. In the stomach

15. What happens during muscle contraction?
A. The muscle always lengthens
B. The muscle becomes larger and shorter

C. The muscle disappears
D. The muscle loses strength

16. Which muscle is considered a contractor muscle?
A. Triceps
B. Abductor
C. Biceps
D. Rotator cuff

17. What is NOT a cause of muscle fatigue?
A. Nutritional deficiency
B. Regular exercise
C. Poor ventilation
D. Insomnia

18. Where is the nucleus located in cardiac muscle cells?
A. At the edges only
B. They have no nucleus
C. In the center
D. Randomly distributed

19. Which type of muscle is responsible for moving food through the digestive tract?
A. Skeletal muscle
B. Cardiac muscle
C. Smooth muscle
D. Voluntary muscle

20. What is a characteristic of voluntary muscles?
A. They are under conscious control
B. They work automatically
C. They are found in internal organs
D. They have single nuclei

ANSWER KEY

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

12. C
13. B
14. C
15. B
16. C
17. B
18. C
19. C
20. A

المقارنات

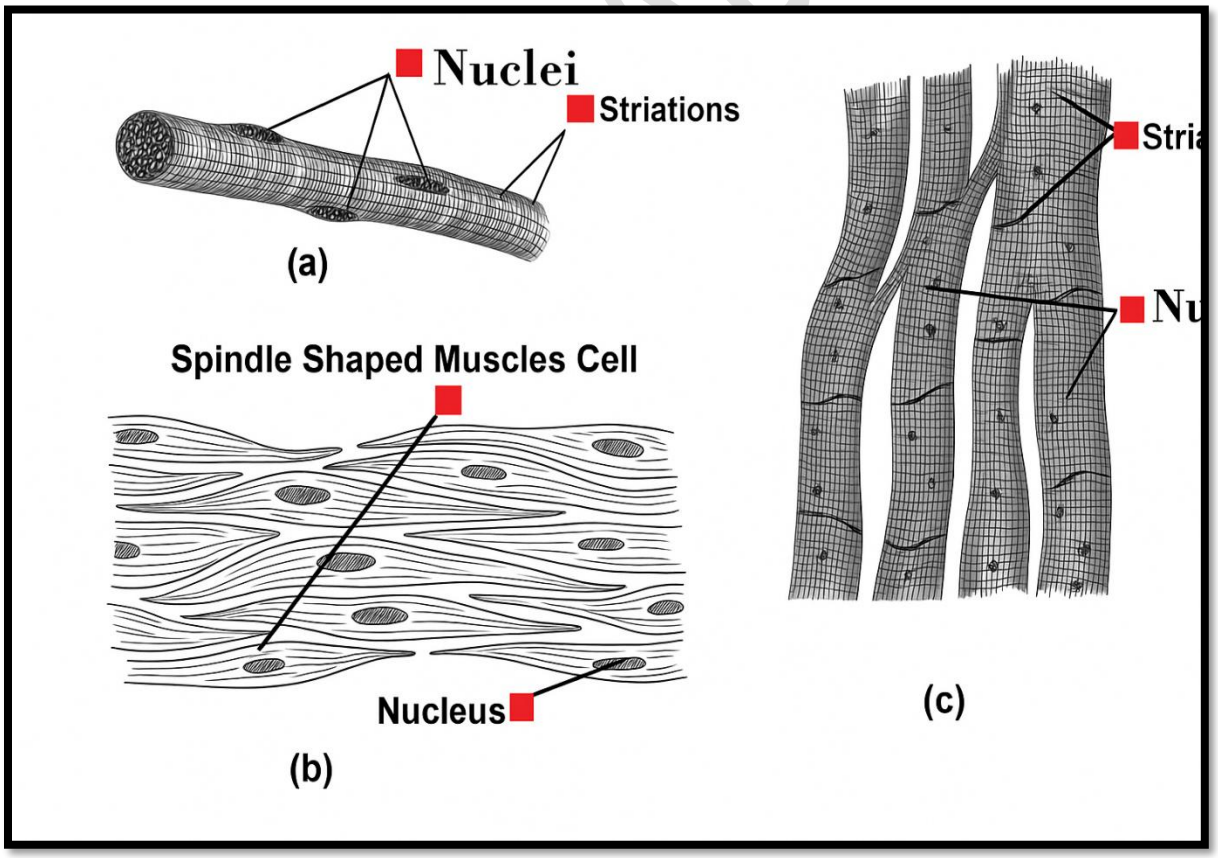
biceps	Triceps
located in the front of the humerus	located behind the humerus
When the arm bends through the humerus, the bicep muscle contracts	When arm relaxes, triceps muscle contract and the arm goes-away from the humerus
The biceps muscle is contractor	the triceps muscle is relaxer

Skeletal muscles	Smooth muscles	Cardiac muscles
This muscle connected with the bony skeleton (by tendon) and they are responsible the body movement.	muscle found in the walls of the internal organs, such as muscular tissue of the bladder, intestine, stomach and uterus	found in the walls of the heart
consist of many cells called (muscle fibers) they are elongated cell and they lie in lengthways along the line of muscle contraction	(Muscle fibers) spindle shape	There cells are striped, short and branched into other branches which connect to each other
They are straited	Not straited	They are straited
Voluntary muscles	Involuntary muscles	Involuntary muscles
contain more than one nucleus which is not located in the center of muscle	Muscle fibers contain 1 nucleus located in the center of muscle cell	these cells contain one nucleus located in the center of muscle but sometime two nuclei
These cells have bright and dark sections	These cells have not bright and dark sections, for this	These cells have bright and dark sections

	reason they are called smooth muscles.	

الموقع والوظيفة

biceps	located in the front of the humerus	When the arm bends through the humerus, the bicep muscle contracts
triceps	located behind the humerus	When arm relaxes, triceps muscle Contract and the arm goes-away from thehumerus
adductor muscle	It is close to body mid line	when it contracts arm became closer to the trunk
deltoid muscle(abductor)	surrounds the shoulder	opposite the closer muscles (armmove away from the trunk)
Round muscles	lie obliquely on the neck	

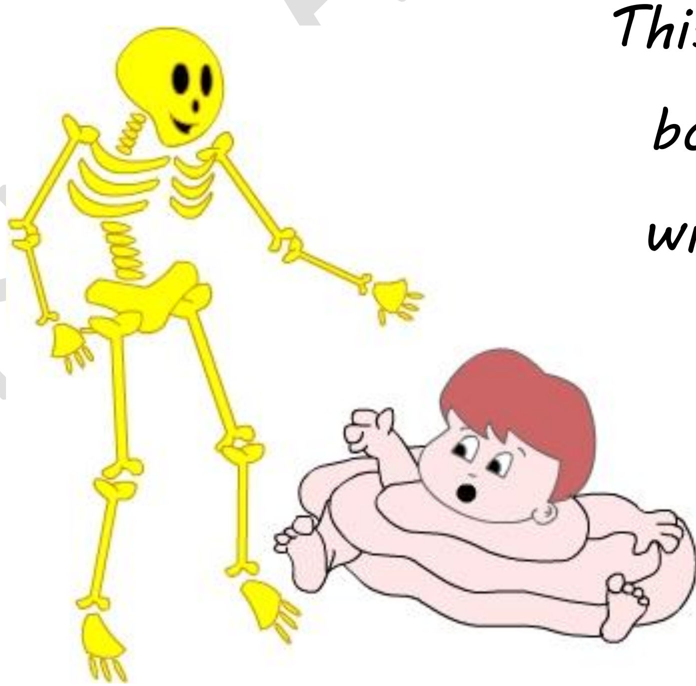


Chapter 1

Skeletal System

ملزمة مادة الاحياء

الاستاذة : اسراء الدباغ



This is what your body looks like without bones.

INTRODUCTION

Body cannot keep its balance and harmony without having a hard support to its soft parts. this support called skeleton.
There is strong link between the work of muscle and bone which are together called as movement system

Muscles are responsible for generating power necessary for the movement. But muscles usually support the bones and they change this power into a movement

لا يستطيع الجسم أن يحافظ على توازنه وانسجامه من دون وجود دعامة صلبة لأجزائه اللينة، وهذه الدعامة تُسمّى الهيكل العظمي.
هناك ارتباط قوي بين عمل العضلة والعظم، ويُطلق عليهما معًا اسم جهاز الحركة.
العضلات مسؤولة عن توليد القوة اللازمة للحركة، لكنها عادةً ما تستند إلى العظام وتحوّل هذه القوة إلى حركة.

Skeletal system Functions

- **Rigid support**
- **Gives the shape of body and straightness of body**
- **Parts of skeletal system are connected with the movement organs and muscles.**
- **some of its part protect the significant organs from external effects. Skull protects the brain ,Thoracic cage protects the lungs and heart**

وظائف الجهاز الهيكلي

- **يوفر دعامة صلبة.**
- **يعطي الجسم شكله واستقامته.**
- **ترتبط أجزاء الجهاز الهيكلي بأعضاء الحركة والعضلات.**
- **بعض أجزائه تحمي الأعضاء المهمة من المؤثرات الخارجية.**
  - **الجمجمة تحمي الدماغ.**
  - **القفص الصدري يحمي الرئتين والقلب.**

What are the functions of skeletal system?

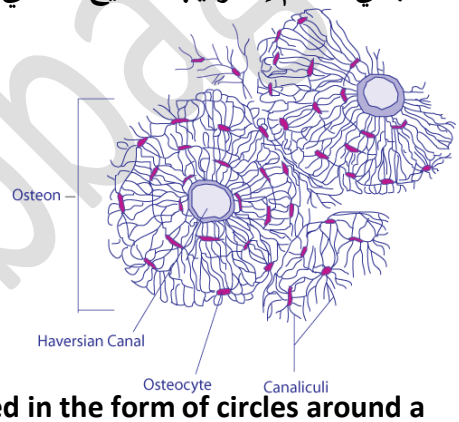
Bone structure

The bone tissue is composed of star- like bone cells called osteocytes, which are arranged in the form of circles around a central canal called as Haversian canal. it is discovered by the scientist Clapton Havers.

Osteocytes secretes ossein which is the solid substance of bone.

The tissue formation of any bone does not differ one from another except some bones.

نسيج العظم يتكون من خلايا عظمية نجمية الشكل تُسمّى الخلايا العظمية **وهي مرتبة على شكل دوائر حول قناة مركزية تُسمّى** قناة هافرس**، التي اكتشفها العالم** كلاپتون هافرس**.تفرز الخلايا العظمية الصفائح العظمية التي تُعد المادة الصلبة في العظم.إن تركيب النسيج العظمي لا يختلف من عظم إلى آخر، باستثناء بعض العظام.**



Who is responsible of the following: Secrete ossein?
Osteocyte

Osteocytes: they are star - like bone cells, which are arranged in the form of circles around a central canal called as Haversian canal. They secrete ossein which is the solid substance of bone.

Haversian canal: It is a central canal in the bone through which blood vessels passes and bone cells are arranged in the form of the circles around this canal, this canal discovered by the scientist Clapton havers.

Ossein :it is the solid substance of bone in the bone tissue which is secreted by osteocytes.

Movement system: it is a system which composed of muscle and bone. Muscles are responsible for generating power necessary for the movement. But muscles usually support the bones and they change this power into a movement

Parts of bone

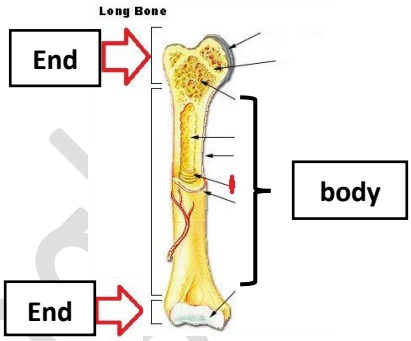
Bones in human body are similar in structure but vary in shape and size

- **Femur bone is made up of body and two ends**
- **Body covered by external membrane which contains nerves and blood to nourish the bone this membrane called (periosteum)**

عظام في جسم الإنسان متشابهة في التركيب لكنها تختلف في الشكل والحجم.

- **عظم** الفخذ **يتكون من جسم وطرفين.**
- **يغطي الجسم غشاء خارجي يحتوي على أعصاب وأوعية دموية لتغذية العظم، ويُسمّى هذا الغشاء** السِمحاق
- **After periosteum, compact bone comes** it **Is hardest bone layer and contain bone marrow inside it**
- **The two ends are distinguished from the body of bone by**

  being spongy,
- **spongy bone is not surrounded by periosteum**
- **but instead of periosteum half solid layer called as cartilage**

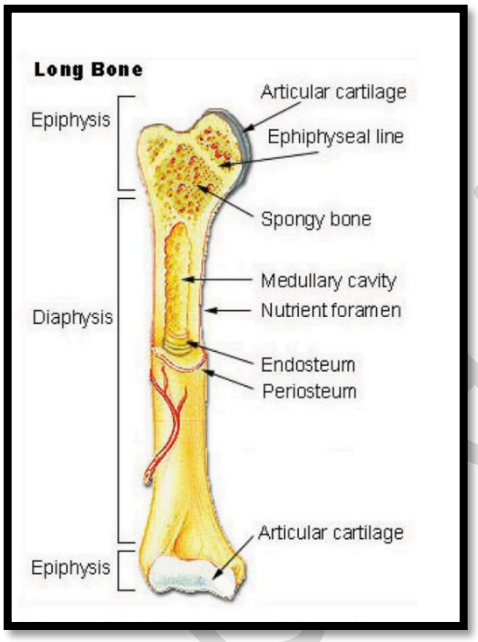


- بعد **السمحاق يأتي العظم** الكثيف(Compact bone) ، **وهو أصلب طبقات العظم ويحتوي في داخله على نخاع العظم.**

•يتميّز طرفا العظم عن جسمه بكونهما إسفنجيين.

•العظم الإسفنجي لا يحيط به السمحاق،

•بل تحيط به بدلاً من السمحاق طبقة نصف صلبة تُسمّى الغضروف



Chemical structure of bone

Bone consists of two major kinds of material:

- **Organic material 35%**
  - is colloid protein known as **collagen**
  - mucous-like substance called mucole, resembles the albumin (white of egg) and it's important for **bone flexibility**
- **inorganic material 65%**
  - these inorganic materials are phosphate, carbonate, calcium florid manganese phosphate and sodium chloride (table salt). They are responsible of **hardness of bones**

التركيب الكيميائي للعظم
يتكون العظم من نوعين رئيسيين من المواد:

المواد العضوية(35%)
المواد العضوية هي بروتينات غروية تُعرف باسم الكولاجين، بالإضافة إلى مادة شبيهة بالمخاط تُسمّى الميوكول، تشبه زلال البيض (الألبومين)، وهي مهمة لإكساب العظام المرونة.

المواد غير العضوية(65%)
تشمل هذه المواد: الفوسفات، الكربونات، فلوريد الكالسيوم، فوسفات المنغنيز، وكلوريد الصوديوم (ملح الطعام).
وتكمن أهميتها في أنها مسؤولة عن صلابة العظام.

Explain the chemical structure of bones

Organic materials	Inorganic materials
The percentage in the bone is 35%	The percentage in the bone is 65%
is colloid protein known as **collagen** and mucous-like substance called mucole, resembles the albumin (white of egg) and it's important for **bone flexibility**	They are phosphate, carbonate, calcium florid manganese phosphate and sodium chloride (table salt). They are responsible of **hardness of bones**

Q :Which is responsible for :

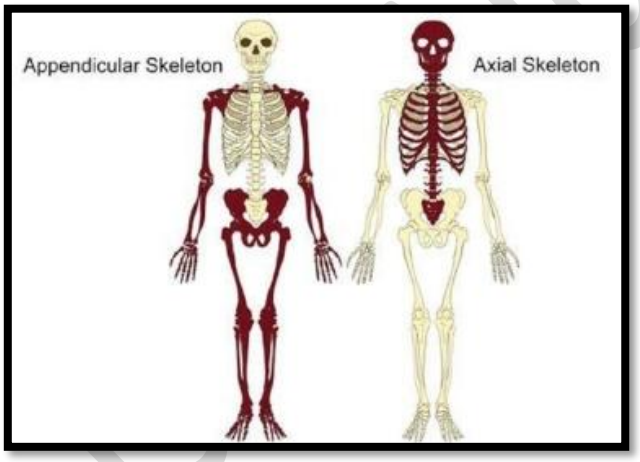
Bone Flexibility : Mucole

Hardness of bone : The organic materials phosphate, carbonate, calcium florid manganese phosphate and sodium chloride (table salt).

Parts of human skeleton

Human has two main parts, they are:

- **Axial skeleton**
  - 1- skull
  - 2- vertebral column
  - 3- thoracic cage (sternum and ribs)
- **appendicular skeleton**
  - 1- pectoral girdle and upper limbs
  - 2- pelvic gridle and lower limbs



الجهاز الهيكلي في الإنسان له قسمان رئيسيان، وهما:

الهيكل المحوري
1-الجمجمة
2-العمود الفقري
3-القفص الصدري (عظم القص والأضلاع)

الهيكل الطرفي
1-الحزام الصدري والأطراف العلوية
2-الحزام الحوضي والأطراف السفلية

A- Axial skeleton

1 Skull

A Cranial bones

They are 8 bones which constitute a small box to protect the brain, they are interlocked into another known as (immovable joints)

There is a relatively big hole at the bottom of cranium and this hole is called foramen magnum through which spinal cord passes.
Child 's skull is distinguished from adult's skull by relatively big in size according to other parts of skeleton but the child's face relatively small,
Also in child's skull there are spaces called (fontanelle) which are located between the bones of head and they are covered with a fibrous cartilaginous tissue.

عظام القحف :

هي ثمانية عظام تُكوّن صندوقًا صغيرًا لحماية الدماغ، وهي متشابكة مع بعضها فيما يُعرف بالمفاصل غير المتحركة
يوجد ثقب كبير نسبيًا في أسفل الجمجمة يُسمّى الثقب العُظمى (foramen magnum) يمر من خلاله الحبل الشوكي.

تتميّز جمجمة الطفل عن جمجمة البالغ بأنها أكبر نسبيًا مقارنةً ببقية أجزاء الهيكل العظمي، بينما يكون وجه الطفل أصغر نسبيًا.
كما تحتوي جمجمة الطفل على فراغات تُسمّى اليافوخ (fontanelle) تقع بين عظام الرأس، وهي مغطاة بنسيج غضروفي ليفي.

B Facial bones

They are 14 bones which surround the eyes, nasal cavity, mouth and also bone of ears. These bones are not movable except the lower jaw which can move laterally and vertically why ??? in order to help cutting, crushing and chewing, but upper jaw is not movable why ?? ? because it is joined to cranial bones.

عظام الوجه :

هي أربعة عشر عظمًا تُحيط بالعينين وتجويف الأنف والفم وكذلك عظام الأذن. هذه العظام غير متحركة باستثناء الفك السفلي الذي يمكن أن يتحرك جانبيًا وعموديًا، لماذا؟؟
لكي يساعد على القطع والطحن والمضغ. أما الفك العلوي فهو غير متحرك، لماذا؟؟
لأنه متصل بعظام الجمجمة

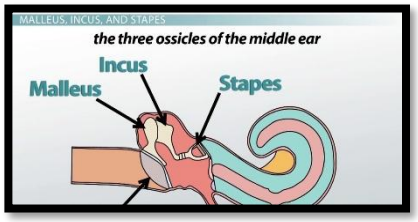
C Ear bones

They are three small bones located in middle ear named as (malleus, incus, stapes)

هي ثلاثة عظام صغيرة تقع في الأذن الوسطى تُسمّى: المطرقة(Malleus) ، السندان(Incus) ، الركاب.(Stapes)

Define

Foramen magnum: it is a relatively big hole at the bottom of cranium and this hole through which spinal cord passes



Fontanelle: they are spaces in child's skull which are located between the bones of the head and they are covered with fibrous cartilaginous tissue

Q :Write the type of joint between the cranium

Immovable joint

Q :Write the location and function of : foramen magnum

Location : at the bottom of cranium

Function :the spinal cord passes through it

Causes

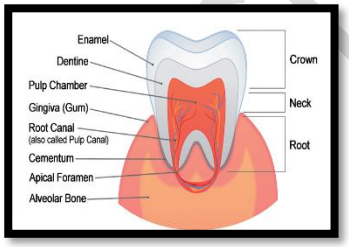
Q :Write the causes :

1- **There is a relatively big hole at the bottom of cranium**
   Because the spinal cord passes through it
2- **the lower jaw can move laterally and vertically**
   in order to help cutting, crushing and chewing the food
3- **the upper jaw is not movable**
   because it is joined to cranial bones.

TEETH

Teeth : they are conical or elongated white structures like bones.
Function :They help us to cut, tear, grind the food
The teeth are arranged on the jaws, there are 16 teeth on each jaw and total number of teeth is 32 in an adult person they are transplanted in the jaws and covered partially with the gums

الأسنان: هي تراكيب بيضاء مخروطية أو متطاولة تشبه العظام.
تساعدنا على قطع وتمزيق وطحن الطعام.
تُرتب الأسنان على الفكين، حيث يوجد 16 سنًا في كل فك، ويبلغ العدد الكلي للأسنان في الشخص البالغ 32 سنًا.
وهي منغرزة في الفكين ومغطاة جزئيًا باللثة.



Regions of tooth

Tooth contain three regions

- **Crown: which represents a visible part of the tooth**
- **Root: which is transplanted in the jawbone**
- **Neck: which is located between crown and root, also neck surround by gum**

مناطق السن
يحتوي السن على ثلاث مناطق:

- **التاج** :وهو الجزء الظاهر من السن.
- **الجذر** :وهو المزروع داخل عظم الفك.
- **العنق** :وهو الجزء الواقع بين التاج والجذر، كما أن العنق محاط باللثة.

Structure of tooth

Tooth made up of substance called dentine which is very solid substance because it contains calcic material

- **Crown covered with hard shining white external layer called enamel**
- **Whereas the regions of neck and root are covered with rough brown solid substance called (cementum).**
- **Inside the tooth, there is a cavity called pulp in which there are a branched dental nerve and branched blood vessels therefore we can feel the pain, cold, heat, pressure.**
- **They enter the tooth through a hole called apical foramen located at the bottom of root.**

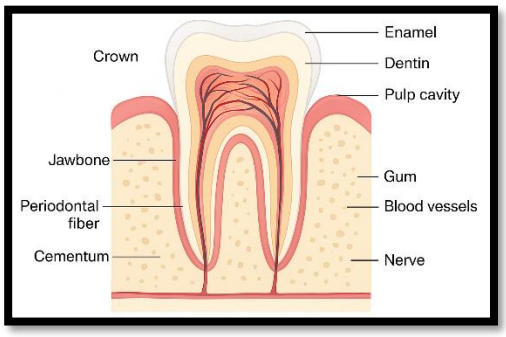
السن مكوّن من مادة تُسمى **العاج(Dentine)** ، وهي مادة صلبة جدًا لاحتوائها على مواد كلسية.

- التاج مغطى بطبقة خارجية صلبة ولامعة بيضاء تُسمى **المينا(Enamel).**
- بينما منطقتا العنق والجذر مغطيتان بمادة صلبة خشنة بنية اللون تُسمى **السمنت**
- داخل السن توجد تجويف يُسمى **اللُّب(Pulp)** ، يحتوي على أعصاب سنية متفرعة وأوعية دموية متفرعة، ولهذا نشعر بالألم والبرد والحرارة والضغط.
- تدخل هذه الأعصاب والأوعية إلى السن من خلال ثقب يُسمى **الثقب القمي (Apical foramen)** الموجود عند قاعدة الجذر.

Dentine: **it is a very solid substance because it contains calcic material and the tooth is made up of it.**
Enamel: **it is hard shining white external layer which covers the crown of the tooth.**
Cementum: **it is rough brown solid substance which covers the neck and the root of the tooth**

Draw and label :

The structure of the tooth



Q: Write the cause:

1- **Dentine is very solid substance**
because it contains calcic material

2- **We can the pain, cold, heat, pressure with out teeth**
Inside the tooth, there is a cavity called pulp in which there are a branched dental nerve and branched blood vessels therefore we can feel the pain, cold, heat, pressure.

Q :Write the location and function of : Apical Foramen

Location: **located at the bottom of root**

Function: **the dental nerve and branched blood vessels enter the tooth through it.**

Types of teeth and their numbers

Deciduous(milk) or temporal teeth

They begin to appear after 6th month

and are completed after first year

Then they begin to fall after 6-7 years

There are 10 teeth in each jaw,

total number of temporal teeth is 20

Permanent teeth

They usually begin to appear after 7th years.
their number complete after puberty and the last teeth may delay appearing till age of 32

أنواع الأسنان وعددها

أ) الأسنان اللبنية (الحليبية) أو المؤقتة:

- تبدأ بالظهور بعد الشهر السادس.
- يكتمل ظهورها بعد السنة الأولى.
- تبدأ بالسقوط بعد عمر 6 – 7 سنوات.
- عددها في كل فك **10أسنان**، والمجموع الكلي للأسنان المؤقتة هو **20سنًا**.

ب) الأسنان الدائمة:

- عادةً تبدأ بالظهور بعد عمر 7 سنوات.
- يكتمل عددها بعد البلوغ، وقد يتأخر ظهور آخر الأسنان حتى عمر 32 سنة.

HEALTH OF TEETH

Teeth must be brushed after eating to remove the food remains and prevent bacteria growth.

Visiting the physician periodically to prevent rotten in teeth.

Prevent damage of teeth.

صحة الأسنان

- يجب تنظيف الأسنان بالفرشاة بعد تناول الطعام لإزالة بقايا الطعام ومنع نمو البكتيريا.
- مراجعة الطبيب بشكل دوري للوقاية من تسوس الأسنان.
- الوقاية من تلف الأسنان.

Teeth implant

It is process of implanting an artificial tooth instead of decayed teeth. It is rare why???because it is economically expensive and takes long period.

زراعة الاسنان :

إنها عملية زراعة سن صناعي بدلاً من الأسنان المتسوسة. وهي نادرة لأنها باهظة الثمن من الناحية الاقتصادية وتستغرق فترة طويلة.

Gum inflammation

It is microbial infection that causes splitting in gums and bad smell breath. Smoking, drinking alcohol and bad nutrition increases the infection probability

التهاب اللثة :

انها عدوى ميكروبية تسبب تشقق اللثة ورائحة فم كريهة. إن التدخين وشرب الكحول وسوء التغذية يزيدان من احتمالية الإصابة بالعدوى.

Write the cause of Gum Inflammation

It is microbial infection

Write the symptoms of Gum

splitting in gums and bad smell breath

What are the factors that increase the probability of gum inflammation?

Smoking, drinking alcohol and bad nutrition increases the infection probability

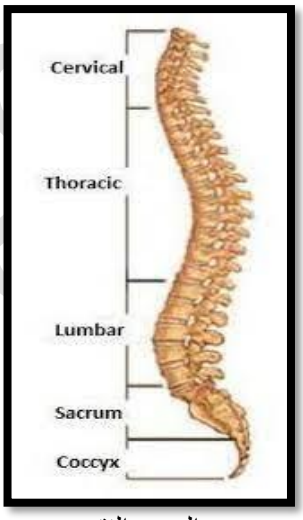
Write the causes: Gum inflammation is rare

because it is economically expensive and takes long period.

Vertebral column

- **The length of vertebral column is 75 cm in an adult**
- **It composed of 33 bones and each one is called vertebra**
- **There is cartilaginous disc between two vertebrates**
- **These cartilages enable the vertebral column to bend to different sides, facilitate the movement of vertebrae and prevent the friction of vertebrae.**

The discs



العمود الفقري

- يبلغ طول العمود الفقري 75 سم عند البالغ.
- يتكوّن من 33 عظمة، وكل واحدة منها تُسمّى فقرة.
- يوجد قرص غضروفي بين فقرتين.
- هذه الغضاريف تمكّن العمود الفقري من الانحناء إلى جهات مختلفة، وتسهّل حركة الفقرات وتمنع احتكاكها

Fill in the blanks:

1- **The length of vertebral column is ..... in an adult**
2- **It composed of ..... bones and each one is called .....**

Write the location and function of: cartilaginous disc

between two vertebrae

These cartilages enable the vertebral column to bend to different sides, facilitate the movement of vertebrae and prevent the friction of vertebrae

Structure of typical vertebra

Each vertebra consists of following parts:

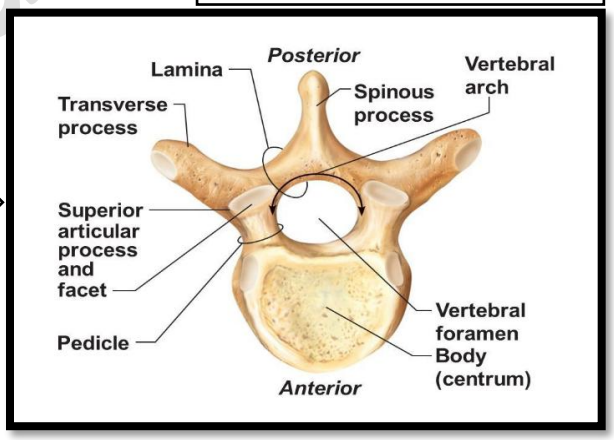
1. **Centrum:** is disc-like flat portion tend to the front part according to their position in the vertebral column

2. **Vertebral arch:** is located to the backside of the centrum. there is a foramen (hole) between arch and Centrum This hole is called (vertebral foramen) when vertebrae are arranged vertically, a tube is formed from their rings and this tube is called as vertebral canal. Spinal cord passes through this tube

3. **Processes:** are osseous appendages emerging from the vertebral.

- **Spinous process:** one of them is in the middle and this process stands in front of the centrum(body) and muscles connect to this part
- **Transvers process:** they are two lateral processes for the connection of ribs
- there are two pairs of processes emerging from vertebral arch articulate the vertebrae one another

Draw and Label



تتكون كل فقرة من الأجزاء التالية:

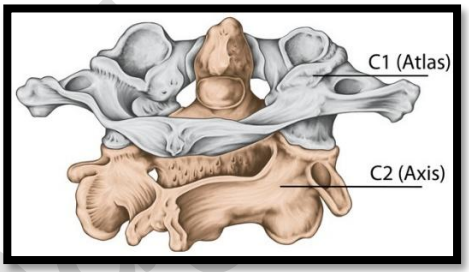
- **الجسم الفقري (Centrum):** وهو جزء مسطح يشبه القرص، يقع في الجهة الأمامية حسب موقعه في العمود الفقري.
- **القوس الفقري (Vertebral arch):** يقع في الجهة الخلفية للجسم الفقري، ويوجد ثقب (foramen) بين القوس والجسم، يسمى **التجويف الفقاري (vertebral foramen)**. وعندما تصطف الفقرات عمودياً، تتكون قناة من هذه الثقوب تعرف بـ **القناة الفقرية(vertebral canal)** ، ويمر خلالها **الحبل الشوكي**.
- **النتوءات (Processes):** وهي امتدادات عظمية بارزة من الفقرة، وتشمل:
  - **النتوء الشوكي (Spinous process):** يقع في الوسط ويبرز خلف الجسم الفقري، وتتصل به العضلات.
  - **النتوءات المستعرضة (Transverse processes):** وهما نتوءان جانبيان يعملان على اتصال الأضلاع.
  - إضافة إلى ذلك، هناك زوجان من النتوءات الناتئة من القوس الفقري تعمل على **مفصلة الفقرات مع بعضها البعض**.

Regions of vertebral column

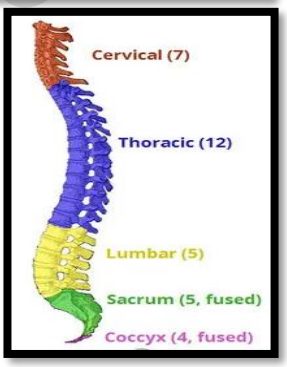
- Cervical region
- Thoracic region
- Lumbar region
- Sacral region
- Coccygeal region

Cervical region

It **consists of seven vertebrae. The first cervical vertebra is called Atlas: it is joined to the bottom of the skull and second cervical vertebrate is called axis: it is joined to atlas with a long process at the top of it, through this connection, the head can easily turn and incline.**



Thoracic region: it is made of twelve vertebrae. ribs are joined to this region



Lumbar region:

It is composed of five broad vertebrae. Their sides are flat

Sacral region:

It consists of five cohesive vertebrae which constitute a single bone called Sacrum

Coccygeal region: it is made up of four vertebrae which are cohesive with one another and they make a single bone called coccyx

مناطق العمود الفقري

- **المنطقة العنقية (Cervical region):** تتكون من سبع فقرات. تُسمّى الفقرة العنقية الأولى **الأطلس(Atlas)** ، وهي متصلة بقاعدة الجمجمة. أما الفقرة العنقية الثانية فتسمى **المحور(Axis)** ، وهي متصلة بالأطلس بامتداد طويل في أعلاها، ومن خلال هذا الاتصال يستطيع الرأس أن يدور ويميل بسهولة.
- **المنطقة الصدرية (Thoracic region):** تتكون من اثنتي عشرة فقرة، وتتصل بها الأضلاع.
- **المنطقة القطنية (Lumbar region):** تتكون من خمس فقرات عريضة ذات جوانب مسطحة.
- **المنطقة العجزية (Sacral region):** تتكون من خمس فقرات ملتحمة تُشكّل معاً عظمة واحدة تُسمّى **العجز (Sacrum).**
- **المنطقة العصعصية (Coccygeal region):** تتكون من أربع فقرات ملتحمة مع بعضها لتُكوّن عظمة واحدة تُسمّى **العصعص(Coccyx).**

LOCATION

Structure	Location
Centrum	the front part according to their position in the vertebral column
Vertebral arch	located to the backside of the centrum in the vertebra
vertebral foramen	between arch and Centrum in the vertebra

Spinous process	is in the middle and this process stands in front of the centrum(body) of vertebra
Transvers process	they are two lateral processes (in the two sides of vertebra)
Articular process	emerging from vertebral arch in the vertebra
Atlas	The first vertebra in the cervical region
Axis	The second vertebra in the cervical region

FUNCTION

Structure	Function
vertebral canal	Spinal cord passes through this tube
Spinous process	muscles connect to this part
Transvers process	the connection of ribs
The other processes (articular processes)	articulate the vertebrae one another

Q&A

Q: Write the cause:

the head can easily turn and incline?

Because the Axis vertebra is joined to atlas with a long process at the top of it, through this connection, the head can easily turn and incline.

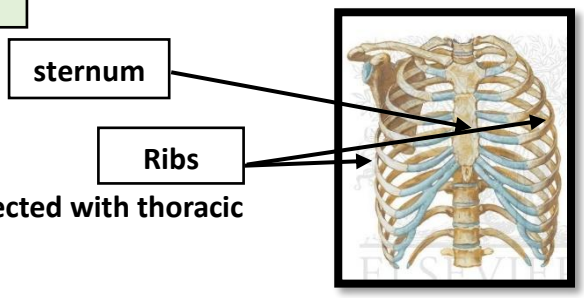
DEfine

Sacrum: it is a single bone in the sacral region it consists of five cohesive vertebrae.

Coccyx: it is a single bone in the coccygeal region made up of four vertebrae which are cohesive with one another.

Thoracic cage

It consists of ribs and sternum



1 Ribs

Human has 12 pairs of ribs, which are articulately connected with thoracic vertebrae at the back side.

1. **But at the front side, the 7 first seven of ribs are directly connected with the sternum by small cartilaginous pieces. these ribs are called as true ribs**
2. **There are three pairs of ribs which not connected to the sternum directly. Firstly, they connect with the cartilage of the seventh rib and then they are together joined to the to the sternum by small cartilaginous pieces are called (false ribs)**
3. **The last two pairs of ribs are not joined to anything at front; therefore, they are called as (Free ribs)**

يمتلك الإنسان 12 زوجًا من الأضلاع، وهي متصلة بالمفاصل مع الفقرات الصدرية من الجهة الخلفية. أما من الجهة الأمامية، فإن الأضلاع السبعة الأولى تتصل مباشرة بعظم القص بواسطة قطع غضروفية صغيرة، وتسمى هذه الأضلاع **الأضلاع الحقيقية**.
هناك ثلاثة أزواج من الأضلاع لا تتصل مباشرة بالقص، بل تتصل أولًا بغضروف الضلع السابع ثم معًا بالقص بواسطة قطع غضروفية صغيرة، وتسمى هذه الأضلاع **الأضلاع الكاذبة**.
أما الزوجان الأخيران من الأضلاع فهما لا يتصلان بأي شيء في الجهة الأمامية، لذلك يُسميان **الأضلاع الحرة**.

LOCATION

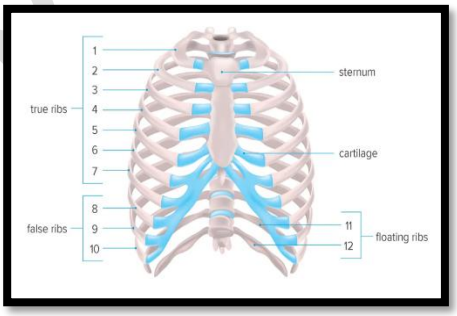
The cartilaginous pieces are the cartilage-like structures, which present in the front side of true and false ribs.

أما القطع الغضروفية فهي تراكيب شبيهة بالغضروف موجودة في الجهة الأمامية للأضلاع الحقيقية والكاذبة

FUNCTION

They are important in process of respiration science they facilitate the movement of the thoracic cage.

وتعد مهمة في عملية التنفس لأنها تسهّل حركة القفص الصدري



Q&A **Write the causes:**

1- The first seven ribs are called true ribs

Because They are directly connected with the sternum by small cartilaginous Pieces.

2- The 8,9 and 10th ribs are called false ribs.

Because they are not connected to the sternum directly. Firstly, they connect with the cartilage of the seventh rib and then they are together joined to the to the sternum by small cartilaginous pieces.

3- The last two pairs of ribs are called free ribs.

Because they are not joined to anything at front.

2 Sternum

Sternum: It is a long structure which consists of three cohesive bones and it is found in the front of the chest. Its lower side is pointed from the sides the true ribs are joined to the sternum by cartilaginous pieces.

عظم القص: هو تركيب طويل يتكون من ثلاث عظام ملتحمة ، ويوجد في مقدمة الصدر. جانبه السفلي مدبب، ومن الجانبين تتصل به الأضلاع الحقيقية بواسطة قطع غضروفية.

COMPARE

Compare between cartilaginous disc and cartilaginous pieces in:

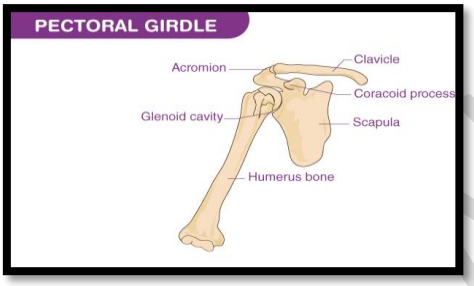
(location and function)

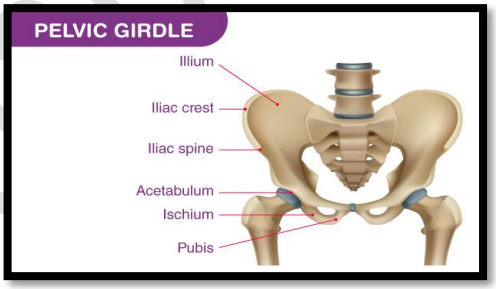
cartilaginous disc	cartilaginous pieces
between two vertebrae	present in the front side of true and false ribs.
enable the vertebral column to bend to different sides, facilitate the movement of vertebrae and prevent the friction of vertebrae	They are important in process of respiration science they facilitate the movement of the thoracic cage.

B-Appendicular skeleton

This skeleton is composed of double bones, which are located on both sides of body. Bones of limbs are joined to axial skeleton by means of two girdles: Shoulder girdle and pelvic girdle respectively

ب- الهيكل الطرفي: يتكون هذا الهيكل من عظام مزدوجة تقع على جانبي الجسم. وترتبط عظام الأطراف بالهيكل المحوري عن طريق حزامين هما :**حزام الكتف** و**الحزام الحوضي** على التوالي.

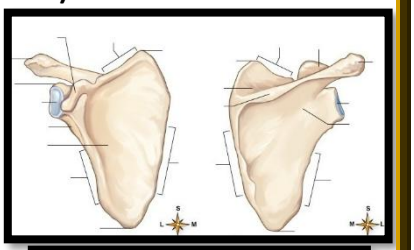




Pectoral girdle and upper limbs

Pectoral girdle: it consists of two bones in each side they are;(shoulder girdle)

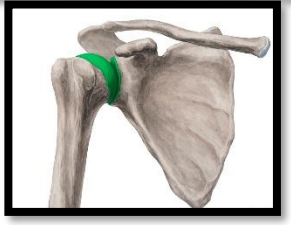
Scapula: level triangle-like bone. Its back-surface forms along process which extends to backside. But the front surface is soft and somewhat concave.
Scapula is located in the backside of the body outside the ribs and joined to the muscle of the shoulder



Clavicle: is the thin arch-like bone and its position in the body can be felt since it extends between the scapula and the top of the sternum.

Shoulder joint formation

There is a cavity which is formed from the meeting of the of scapula and clavicle, (the shoulder girdle). The head of the hummers settles the cavity and constitute the shoulder joint.

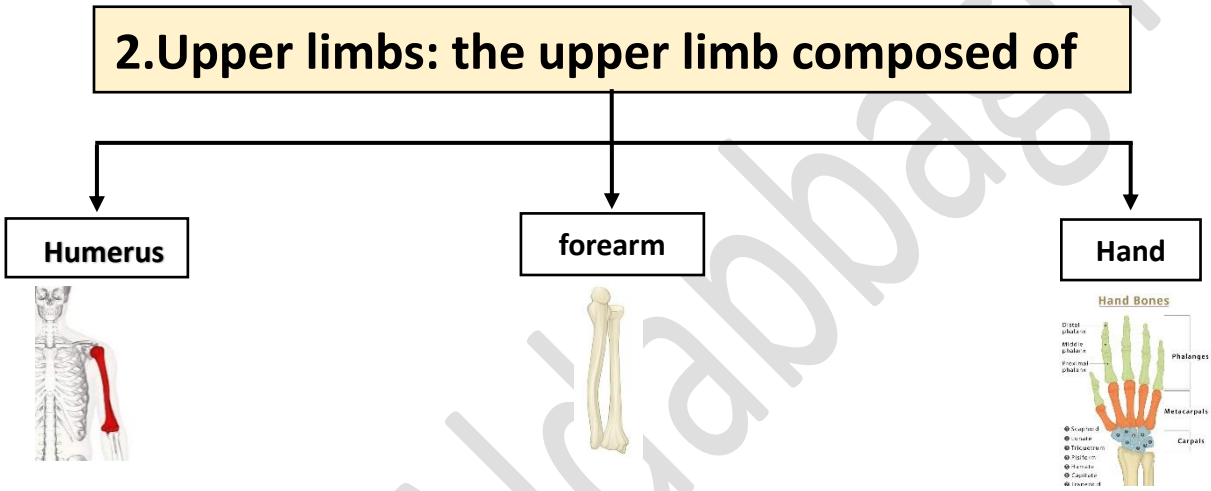


الحزام الصدري: يتكون من عظمين في كل جانب، هما:

الكتف (الحزام الكتفي):

- **الكتف (لوح الكتف) :**عظم ذو شكل مثلثي. سطحه الخلفي يشكل بروزًا طويلًا يمتد إلى الخلف، أما سطحه الأمامي فهو أملس ومقعر قليلًا. يقع لوح الكتف في الجهة الخلفية للجسم خارج الأضلاع، ويرتبط بعضلات الكتف.
- **الترقوة :**عظم رقيق يشبه القوس، ويمكن الإحساس بموقعه في الجسم لأنه يمتد بين لوح الكتف وأعلى عظم القص.

يوجد تجويف يتكون من التقاء لوح الكتف مع الترقوة (الحزام الكتفي)، ويستقر رأس عظم العضد في هذا التجويف مكونًا **مفصل الكتف.**



الأطراف العلوية: يتكوّن الطرف العلوي من: العضد، الساعد، اليد

Humerus

Its long and strong bone Upper end is round and forms then head of the upper arm which is articulated with scapula by joint from the top
The movement of this joint is approximately circular since the head of upper arm is big, on the other side, it is articulated with the bones of the forearm by the elbow joint

عظم العضد :عظم طويلة وقوية، يكون طرفها العلوي مستديراً ويكوّن رأس الذراع العلوية الذي يتصل مع لوح الكتف بمفصل من الأعلى.
وتكون حركة هذا المفصل شبه دائرية بسبب كِبَر رأس الذراع العلوية، ومن الجهة الأخرى يتصل بعظام الساعد عن طريق مفصل المرفق.

forearm

it consists of two long bones;
Ulna and Radius.
Ulna is the longest bone and located in the direction of the little finger.
Radius is located in direction of thumb
From the top, these two bones are articulated with the humerus and from bottom with the wrist (carpal bones).

يتكوّن من عظمتين طويلتين:
الزند والكعبرة.
الزند هو أطول عظم ويقع باتجاه الإصبع الصغير،
أما الكعبرة فتقع باتجاه الإبهام.
من الأعلى ترتبط هاتان العظمتان مع عظم العضد، ومن الأسفل مع الرسغ (عظام الرسغ).

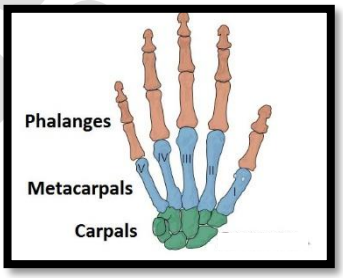
Hand

It consists of 27 bones, which are divided into three part; carpal bones(wrist), metacarpal bones and phalanges.

The wrist; is composed of 8 bones which are arranged into two rows and there are 4 bones in each row.

The metacarpal bones (palm); are made of 5 bones which are relatively long

The finger: are composed of fourteen bones known as phalanges each finger are contains three phalanges, except the thumb; it contains two phalanges.



الرسغ: يتألف من 8 عظام مرتبة في صفين، تكوّن من 27 عظمة، وتنقسم إلى ثلاثة أجزاء: عظام الرسغ، عظام المشط، والسلاميات في كل صف منها 4 عظام

عظام المشط (راحة اليد): تتكوّن من 5 عظام وهي طويلة نسبياً
الأصابع: تتكوّن من أربعة عشر عظماً تُعرف بالسلاميات، يحتوي كل إصبع على ثلاث سلاميات، ما عدا الإبهام؛ فإنه يحتوي على سلاميتين فقط

The movement of shoulder joint is approximately is circular

since the head of upper arm is big

Write the corresponding name of:

The metacarpal bones: (palm)

carpal bones :(wrist)

Fill in the blanks :

1- **each finger is containing three phalanges, except the thumb; it contains two phalanges.**

Pelvic girdle and lower limbs

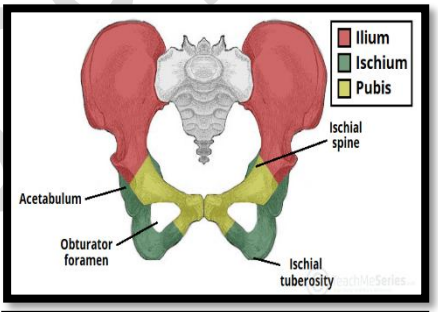
1 Pelvic girdle

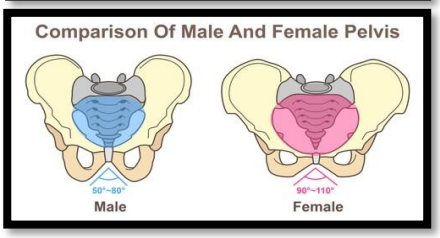
It consists of two symmetrical halves. each of them composed of three cohesive bones; ilium, ischium and pubis.
The pelvis is like a vessel on which the vertebral column rests.
The pelvis is articulated with the lower limbs. Also, a part of intestine and some other internal organs are found in the pelvis.

الحزام الحوضي: يتكوّن من نصفين متماثلين، وكل واحد منهما يتألف من ثلاث عظام متصلة هي: الحرقفة، والورك، والعانة
الحوض يشبه الوعاء الذي يستند عليه العمود الفقري.
يرتبط الحوض مع الأطراف السفلية، كما توجد بداخله أجزاء من الأمعاء وبعض الأعضاء الداخلية الأخرى.

There are some different between male and female pelvis:

- **Bones of pubis in female are lighter than male**
- **Pelvis is wider in female to facilitate the pregnancy period**
- **Pelvis in female is less deep than in male**





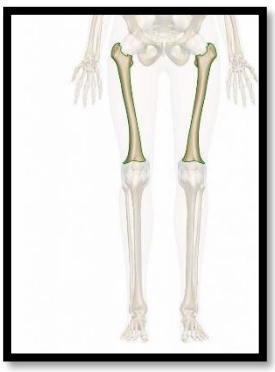
هناك بعض الاختلافات بين حوض الذكر والأنثى:
عظام العانة لدى الأنثى أخف من تلك الموجودة لدى الذكر.
الحوض عند الأنثى أوسع لتسهيل فترة الحمل.
الحوض عند الأنثى أقل عمقاً مقارنةً بحوض الذكر.

Lower limbs

Lower limbs are made up of femur, leg, and foot

Femur

is the longest and strongest bone of the body
it corresponds to the humerus found in the upper limbs.
From upper side this bone contains spherical head which enters the acetabular cavity and form (ball and socket)
From a bottom, femur is articulated with tibia by knee joint.



تكوّن الأطراف السفلية من عظم الفخذ، الساق، والقدم.
يعادل عظم الفخذ عظم العضد الموجود في الأطراف العلوية.
من الأعلى يحتوي هذا العظم على رأس كروي يدخل في تجويف الحُقّ (الحُقّي) ليكوّن مفصل كرة ومقبس.
من الأسفل يرتبط عظم الفخذ بعظم الظنبوب عن طريق مفصل الركبة.

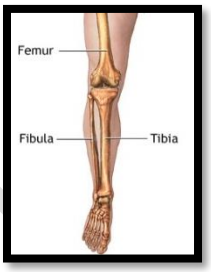
Leg

is made up of two bones; one of them is located beside other one they are tibia and fibula corresponding to the ulna and radius in the forearm.

Fibula does not turn around tibia as radius turn around ulna, because fibula is thinner than the tibia, and the two ends of fibula are connected to tibia

Leg and femur constitute the knee joint, the type of this joined is (Hinge).

There is flattened small bone called (patella) the front of knee joint. The leg is connected to the foot by the ankle joint.



الساق :يتكوَّن من عظمتين؛ إحداهما تقع بجانب الأخرى وهما الساق (Tibia) والشظية (Fibula) المقابلتان لعظم الزند (Ulna)وعظم الكعبرة (Radius) في الساعد.

الشظية لا تدور حول الساق كما يدور الكعبرة حول الزند، لأن الشظية أرفع من الساق، ونهايتا الشظية متصلتان بالساق.

تكوّن الساق والفخذ مفصل الركبة، ونوع هذا المفصل هو **مفصل مفصلي**.**(Hinge)**

يوجد عظم مسطح صغير يسمى **الرضفة (Patella)** أمام مفصل الركبة.

وترتبط الساق بالقدم عبر مفصل الكاحل

Fibula does not turn around tibia as radius turn around ulna

fibula is thinner than the tibia, and the two ends of fibula are connected to tibia

write the location of patella

in front of knee joint

Write the type of knee joint?

Hinge

foot

Foot made up of 26 bones which are distributed into three part like in the palm. The first part called as ankle (tarsal) which correspond to the wrist found in the hand. Tarsals are composed of 7 bones

Second part is the metatarsal which contain 5 bones.

The third part is toes (phalanges) like fingers and they are distributed in the same way.

Toes they are composed of 14 bones

Hallux doesn't move easily, function of foot is walking

Write the corresponding name of:

Ankle: (tarsal)

Q: Write the cause:

The function of foot is walking

Because Hallux doesn't move easily like the thumb

Fracture of the bone

Fracture: is the split of bone (the bone the division of bone) into two parts or more. It happens as a result of a strong sudden contraction of muscles like the fracture in patella in case of muscle contraction which is connected to patella or when the bone is exposed to a direct external shock such as when a hard body falls on the bone or when a bullet hit it .or when bones faces a powerful shock or bone decaying because of a disease like bone tuberculosis , cancer . thus, the bone breaks by itself immediately after a natural movement due to weak resistance.

الكسر: هو انقسام العظم إلى جزأين أو أكثر. يحدث نتيجة انقباض مفاجئ قوي للعضلات مثل الكسر في صابونة الركبة عند انقباض العضلة المتصلة بها، أو عند تعرض العظم لصدمة خارجية مباشرة مثل سقوط جسم صلب عليه أو إصابته برصاصة، أو عند تعرض العظام لصدمة قوية، أو نتيجة تآكل العظم بسبب مرض مثل السل العظمي أو السرطان. وبالتالي قد ينكسر العظم من تلقاء نفسه مباشرة بعد حركة طبيعية بسبب ضعف مقاومته.

Write the causes of fracture:

It happens as a result of a strong sudden contraction of muscles like the fracture in patella in case of muscle contraction which is connected to patella or when the bone is exposed to a direct external shock such as when a hard body falls on the bone or when a bullet hit it .or when bones faces a powerful shock or bone decaying because of a disease like bone tuberculosis , cancer . thus, the bone breaks by itself immediately after a natural movement due to weak resistance.

Sometimes the bone breaks by its self, why

because of a disease like bone tuberculosis, cancer. thus, the bone breaks by itself immediately after a natural movement due to weak resistance.

Q : What does the factors that rapidity of treating the fracture depends on?

1- **Fracture type which hits.**
2- **The age of the person, repair of the bone is quicker and better in younger person.**
3- **Nutrition taking food rich in vitamins and calcium accelerate the treatment.**
4- **Treatment method the correct artistic orthopedics is performed by an expert doctor in case of fracture ,he brings back the bone to its right position and then places a splint of gypsum**

for period of time .then ,he monitors the case by taking x-ray photographs of the fracture in order to find out what extent the case has progressed.

س: ما العوامل التي تعتمد عليها سرعة معالجة الكسور؟
1-نوع الكسر الذي يحدث.
2-عمر الشخص، إذ إن التئام العظم يكون أسرع وأفضل عند صغار السن.
3-التغذية، فتناول الأغذية الغنية بالفيتامينات والكالسيوم يسرّع عملية العلاج.
4-طريقة العلاج، حيث يقوم طبيب مختص في جراحة العظام بإعادة العظم إلى وضعه الصحيح ثم يضع جبيرة من الجبس لفترة من الزمن، وبعدها يتابع الحالة عن طريق أخذ صور أشعة للكسر لمعرفة مدى تقدم الشفاء.

Dis-articulation

Is the separation of two bones at their joint, either naturally by way of injury or by surgical operation, But it's different because bone stay healthy just fibers which connect two bones are damaged.

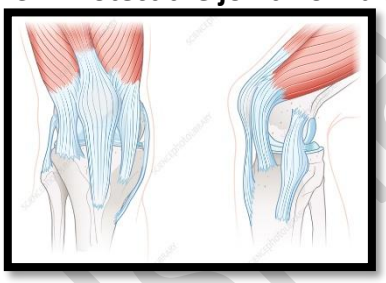
خلع العظام :

هو انفصال عظمتين عند المفصل، إما بشكل طبيعي نتيجة إصابة أو عن طريق عملية جراحية، ولكنه يختلف لأن العظم يبقى سليماً، وإنما تتضرر الألياف التي تربط بين العظمتين فقط.

Structures supporting the skeletal system

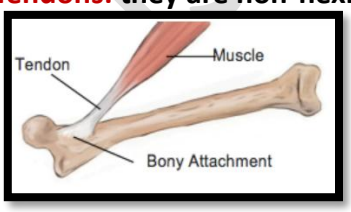
Ligaments: they are strong fibrous bands which connect bones one another

1. **They are flexible**
2. **Allow bones to move**
3. **Protect the joint from dis-articulation**



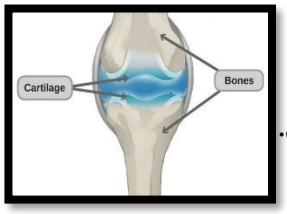
الأربطة: هي حزم ليفية قوية تربط العظام بعضها ببعض
1-تتميز بالمرونة.
2-تسمح للعظام بالحركة.
3-تحمي المفصل من الانفصال.

Tendons: they are non-flexible firm fibrous cord which connect muscles with bones



الأوتار: هي حبال ليفية قوية وصلبة غير مرنة، تربط العضلات بالعظام.

Cartilages: They are white colored, transparent and strong structures can bend without breaking They cover head of bone.



الغضاريف: هي تراكيب قوية بيضاء اللون وشفافة، يمكنها الانحناء دون أن تنكسر، وتغطي رؤوس العظام.

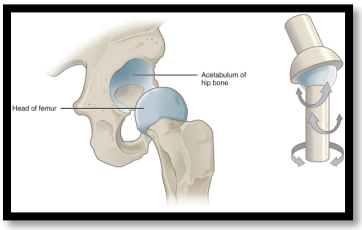
Joints: the meeting points of the bones in the body
Joint is the connection between two bones.

المفاصل: هي نقاط التقاء العظام في الجسم.
المفصل هو الرابط بين عظمتين

TYPE OF JOINTS

Ball and socket

Allows extensive movement, such as rotation in many directions. examples include the joint of the shoulder and hip.



انواع المفاصل
المفصل الكروي الحقّي (Ball and Socket): يسمح بحركة واسعة مثل الدوران في عدة اتجاهات. ومن أمثلته مفصل الكتف ومفصل الورك.

Hinge

Forms junction of two bones, this type of joint allows movement about one axis the elbow is an example of this type of joint.

يشكّل نقطة اتصال بين عظمتين، ويسمح هذا النوع من المفاصل بالحركة حول محور واحد فقط. ومن أمثلته مفصل المرفق.

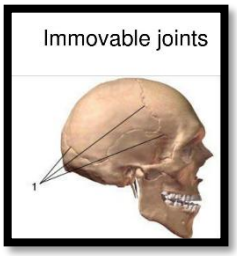
Cylindrical joint

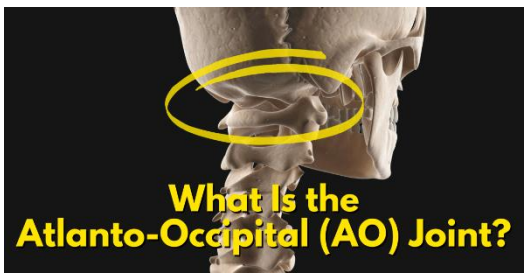
Form a joint of two bones
The junction of the atlas vertebra with occipital bone is an example of this type of joints.

مفصل الأسطواني: يتكوّن من اتصال عظمتين، ومثال على هذا النوع من المفاصل هو اتصال فقرة الأطلس مع العظم القفوي

Immovable joints

they contain structures or interconnection which hold the closely position bone plates together, all cranial bones and facial bones with exception of the mandible are immovable.





المفاصل غير المتحركة: تحتوي على تراكيب أو روابط تعمل على تثبيت صفائح العظام المتجاورة معًا بإحكام، وجميع عظام الجمجمة باستثناء عظم الفك السفلي هي مفاصل غير متحركة.

ligaments	tendons
• They are flexile • Connect bones one another • Fibrous band	• They are non-flexible • Connect muscles with bones • Fibrous cords

Q : Give an example :

1- **Ball and socket joint:** shoulder and hip
2- **Hinge joint:** elbow
3- **Immovable joint:** all cranial bones and facial bones with exception of the mandible are immovable.
4- **Cylindrical:** The junction of the atlas vertebra with occipital bone.

Specialties of human skeleton

1. The balance of the skull over vertebral column enable to balance the skull over the vertebral column make his head high to see far objects.
2. The vertebral column is delicate at the neck region and wide at sacral region, help human in bearing the heavy head and upper limbs
3. Width of pelvis in human, facilitate the balance of the trunk on lower limbs
4. The lower limbs are longer than the upper ones, help human in walking with wide paces.
5. Presence of bending at the hollow of foot, helps human in walking in comfortable way, jumping running easily

1-توازن الجمجمة فوق العمود الفقري يمكّن الإنسان من إبقاء رأسه مرفوعًا لرؤية الأجسام البعيدة.
2-العمود الفقري رقيق عند منطقة الرقبة وواسع عند المنطقة العجزية، مما يساعد الإنسان على حمل الرأس الثقيل والأطراف العلوية.
3-عرض الحوض عند الإنسان يسهّل توازن الجذع على الأطراف السفلية.
4-الأطراف السفلية أطول من الأطراف العلوية، وهذا يساعد الإنسان على المشي بخطوات واسعة.
5- وجود الانحناء في باطن القدم يساعد الإنسان على المشي بطريقة مريحة، والقفز والجري بسهولة.

Write the causes

1- **Human can see far objects**
Because of The balance of the skull over vertebral column make his head high
2- **Human can bear the heavy head and upper limbs**

Because the vertebral column is delicate at the neck region and wide at sacral region

3- The Width of pelvis in human

Because this facilitate the balance of the trunk on lower limbs

4- Presence of bending at the hollow of foot

Because this helps human in walking in comfortable way, jumping running easily

5- The lower limbs are longer than the upper ones

Because it helps human in walking with wide paces

- **Bone growth in human continue age of twenty by effect of hormones secreted by pituitary gland**
- **There are cartilaginous discs between vertebrates**
- **There is patella in front of knee joint to protect it but there is no such type of bone in elbow joint**
- **Vertebra starts to bend in aging**
- **Using synthetic drugs causes bone decay**
- **bone marrow is used in tissue transplant.**

***يستمر نمو العظام عند الإنسان حتى سن العشرين بتأثير الهرمونات التي تفرزها الغدة النخامية.**
•توجد أقراص غضروفية بين الفقرات.
•توجد الرضفة أمام مفصل الركبة لحمايته، لكن لا يوجد مثل هذا النوع من العظام في مفصل المرفق.
•يبدأ العمود الفقري بالانحناء عند التقدم في العمر.
•استخدام الأدوية الصناعية يسبب تآكل العظام.
•يُستخدم نخاع العظم في زراعة الأنسجة.

Some disease

Rickets

Can be seen in children between 1-2 years

Causes:

Deficiency of vitamin (D) and not exposing to sunlight are causes of the disease

Symptoms:

1- **Retardation in teeth grow, walking and ossification of cranial bones. Also curved leg are one of symptoms.**
2- **patient get nerves and cries much more than normal children.**

Remedy

1- **Visiting the physician and taking a necessary drug**
2- **Exposing child to the enough sunlight**

Prevention

1- **Mother must breast feed the child**
2- **Exposing child to enough sunlight especially in winter**

الكساح
يمكن أن يُلاحظ عند الأطفال بين عمر سنة إلى سنتين.
يحدث نتيجة نقص فيتامين (د) وعدم التعرض الكافي لأشعة الشمس.

الأعراض

1. تأخر في نمو الأسنان، وتأخر في المشي وتَعظّم عظام الجمجمة. كما أن تقوس الساقين يُعد أحد الأعراض.
2. يُصبح الطفل عصبياً ويكثر من البكاء أكثر من الأطفال الطبيعيين.

العلاج

- زيارة الطبيب وأخذ الدواء اللازم.
- تعريض الطفل لأشعة الشمس بشكل كافٍ.

الوقاية

- يجب على الأم أن تُرضع طفلها رضاعة طبيعية.
- تعريض الطفل لأشعة الشمس بشكل كافٍ، وخاصة في فصل الشتاء.

Upper limbs	Lower limbs
the upper limb composed of hummers, forearm and hand	Lower limbs are made up of femur, leg, and foot
Shorter than the lower limbs	Longer than the lower limbs
Connected to pectoral girdle	Connected to pelvic l girdle
There is no patella	There is a patella
radius turn around ulna	Fibula does not turn around tibia

Diseases	Causes	Symptoms
Rickets	Deficiency of vitamin (D)andnot exposing to sunlight are causes ofthe disease	Retardation in teeth grow, walking and ossification of cranialbones. *Also curved leg are one of symptoms. *Patient get nerves and cries much more than normal children

Structure and organ	The shapes
osteocytes	star-like cells
Femur bone	is made up of body and two ends
Cranial bone	constitute a small box
Centrum	disc-like flat portion
Scapula	triangle-like bone
Clavicle	is the thin arch-like bone

Number	Organ or structure
35 %	the percentage of organic materials
29 bones	Skull bones
65%	the percentage of inorganic materials
8bones	Cranial bones
14bones	Facial bones
32	Number of permanent teeth
20	Number of milk teeth
75 cm	Length of vertebral column
33bones	Number of the vertebral column bones
7 vertebrae	Cervical region
12 vertebrae	Thoracic region
5 vertebrae	Lumbar region
5 vertebrae	Sacral region
4 vertebrae	Coccygeal region
12 pairs of bones	Ribs number
27 bones	Hand

Name	Location	Function
osteocytes	The cells in the bones	secretes ossein which is the solid substance of bone
periosteum	external membrane covers the body of the bone	contains nerves and blood to nourish the bone this membrane

cranial bones	Skull	protect the brain
foramen magnum	bottom of the cranium	spinal cord passes through it
cartilaginous disc	between two vertebrates	enable the vertebral column to bend to different sides ,facilitate the movement Of vertebrae and prevent the friction of vertebrae
Centrum	tend to the front part according to their position in the vertebral column	
Vertebral arch	is located to the backside of the centrum	
Vertebral foramen	between arch and Centrum	Spinal cord passes through this tube
Spinous process	in the middle and this process stands in front of the centrum(body) of vertebra	muscles connect to this part
transverse processes	lateral processes in the vertebra	Connects to ribs
The cartilaginous pieces	present in the front side of true and false ribs	They are important in process of respiration science they facilitate the movement of the thoracic cage
Sternum	In the front of the chest	True ribs join ti it by cartilaginous pieces
Scapula	is located in the backside of the body outside theribs and joined to the muscle of the shoulder	
clavicle	shoulder or pectoral girdle between the scapula and the top of the sternum	
Fontanelle	child's skull	
Ulna	Forearm	
Patella	in front of knee joint	Protect the knee joint
Ligaments	Between two bones	Ligament allow the bones to move and at the same time they protect the joints from disarticulation. And connect bones one another
Tendon	Between muscles and bones	: connect muscles with bones
Haversian canal	centers of osteocytes	

Name : Corresponding name

deciduous teeth :Milk – temporal teeth

Carpels bones: Wrist

Metacarpal bones :Palm

Ankle: Tarsals

Hallux :Big toe

Membranes that cover the organs :

The organ	The membrane
The body of the bone	Periosteum

الاسئلة الوزارية

2024-2025

Q :Define : sternum : It is a long structure which consists of three cohesive bones and it is found in the front of the chest. Its lower side is pointed from the sides the true ribs are joined to the sternum by cartilaginous pieces

Q :What are the scientific concepts of the following :

A disc-like flat portion of vertebra (centrum)

Q : What does the factors that rapidity of treating the fracture (Enumerate only)

الاجابة في الملزمة اعلاه

Q: which is responsible for :

Bone flexibility

Mucole

Q: write the location of :

Periosteum : covers the body of bone

Q: Write the cause of the following:

- **The function of foot is walking**

Hallux doesn't move easily

1- **Who is responsible of the following?**
   Secrete ossein -bone flexibility -Dis articulation -protect the knee joint
2- **Define: fontanelle -osteocyte -periosteum -false ribs -fracture -**

rickets – true ribs - foramen magnum

3- Write the cause of the following?

- 1- Dentin is a very solid substance in the structure of teeth.
- 2- Presence of cartilaginous discs between vertebrae of the vertebral column
- 3- Some ribs are called as true ribs.
- 4- Fibula does not turn around tibia
- 5- Presence of bending at the hollow of the foot
- 6- Vitamin D is necessary for growth of bones and teeth

4- Write the function of: **osteocyte -ligament -tendon -foremen magnum**

5- What is the location of : **fontanelle -sternum -clavicle -ulna – patella-foramen magnum - sternum**

6- Fill in the blanks

1- The skeletal system is divided into two main parts they are; ……and ……

2- The joints between bones of cranium are called ……

3-A tooth consist of three regions …… , ……and ……

4- Thoracic cage consist of…… and ……

5- The shoulder girdle consist of two bones in each sides, they are ……..and ……..

6- Each finger is composed of …… , except the thumb which consist of ……..

7- Lower limbs are made up of bones of …… ,…… and ……

7- Draw the following:

1-Structure of long bone. 2- Longitudinal section of tooth. 3-Structure of typical vertebrae

8- Choose the correct answer.

1- It is the basic substance made up a tooth :

a. Cementum b. dentine c. enamel

2- the length of vertebral column in an adult is :

a. 75 cm b. 57 cm c.70 cm

9- what are the differences between (male and female pelvis) –(ligaments and tendon

10- numerate the factors which increase the rapidity of treating the fracture depends on (only two)

11- give the corresponding name (carpal bones – ankle)

12- what are symptoms for the following diseases? (only two) rickets

13- explain the structure of long bone (femur)

14- explain the structure of a tooth

15- -explain the chemical structure of bone

16- what are the specialties of human skeleton

17- explain the structure of typical vertebrae

18- what is fracture ?and what effect on its repairment ?

19- write names and number of bones in an upper limbs ?

20- give one example : (hinge joint)

21- what are the membrane that cover (bone body)

22- Count only: structures support the skeletal system

23- Named the scientific term of each of the following:

- Thin arch -like bone and it extends between the scapula and the top of sternum

24- The sacrum bone consists of ……..cohesive bones ,while the coccyx bone consists of ……cohesive vertebrae

Answers

1- Who is responsible of the following?

osteocyte – mucole

naturally by way of injury , by surgical operation

patella

2- Define :

Fontanelle: are spaces in child's skull which are located between the bones of head and they are covered with fibrous cartilaginous tissue

Osteocyte: They are star- like cells that form bone tissue ,they secrete ossein

Periosteum: It is a membrane which covers the outer part of the bone. It contains nerves and blood vessels which nourish the bone.

False ribs: they are Eighth, nineth and tenth ribs are not connected to the sternum directly. Firstly they connect with the cartilage of the seventh rib and then they are together joined to the sternum by small cartilaginous pieces.

Fracture : Fracture is the division of bone to two parts or more. It takes places as a strong sudden contraction of muscles or when the bone is exposed to a direct external shock as the fall of hard body on the bone or when a bullet hits it.

Rickets: it is a disease can be seen in children between 1-2 years. Deficiency of vitamin D and not exposing to sunlight are causes of this disease.

True ribs :are the first seven pairs of ribs are directly connected with the sternum by small cartilaginous pieces .

Foramen magnum :it is relatively big hole at the bottom of cranium ,spinal cord passes through it.

3- Write the cause of the following?

1- **Because it contains calcic materials**

2- **Theses cartilages enable the vertebral column to bend to different sides ,facilitate the movement Of vertebrae and prevent the friction of vertebrae**

3- Because they are directly connected with the sternum by small cartilaginous pieces.

4- Because fibula is thinner than the tibia and the two ends of fibula are connected to tibia

5- Helps human in walking in a comfortable way , jumping and running easily .

6- It helps the absorption of calcium and phosphor elements

4- Write the function of:

Osteocyte secretes ossein which is the solid substance of bones

Ligament: Ligament allow the bones to move and at the same time they protect the joints from disarticulation. And connect bones one another

Tendon: connect muscles with bones .

Foramen magnum :the spinal cord passes through it

5- What is the location of : fontanelle -sternum -clavicle -ulna – patella- foramen magnum - haversian canal

Fontanelle :child's skull

Sternum :thoracic cage in the front of the chest

Clavicles :shoulder or pectoral girdle , between the scapula and the top pf sternum

Ulna :forearm

Patella :in front of knee joint

Foramen magnum : big hole at the bottom of the cranium

Haversian canal centers of osteocytes

6- Fill in the blanks :

1-The skeletal system is divided into two main parts they are; …axial ……..and ……appendicular …

2-The joints between bones of cranium are called ……immovable joints.

3-tooth consist of three regions …crown… , …root……..and ……..neck……

4-Thoracic cage consist of…….ribs…… and …sternum……

5-The shoulder(pectoral) girdle consist of two bones in each sides, they are …scapula ….and …clavicles..

5-Each finger is composed of ……3 phalnges……, except the thumb which consist of …2 phalanges

6-Lower limbs are made up of bones of …….. ,…… and ……

7-Choose the correct answer:

b. Dentine

a.75 cm

8- what are the differences between (male and female pelvis) –(ligaments and tendon)

1- Bones of pubis in female are lighter than in male

2- Pelvis is wider in female to facilitate the pregnancy period.

3- Pelvis in female is less deep than in male

ligaments	tendons
• They are flexile • Connect bones one another • Fibrous band	• They are non-flexible • Connect muscles with bones • Fibrous cords

8- numerate the factors which increase the rapidity of treating the fracture depends on (only two)

1- Fracture type which hits bone.
2- The age of the person; repair of the bone is quicker

and better in younger person.

3- Nutrition; Taking food rich in vitamins and calcium

accelerate the treatment.

4.Treatment method; the correct artistic orthopedics is performed by an expert doctor in case of fracture, he brings back the bone to its right position and then he places a splint of gypsum for a period of time. Then, he monitors the case by taking x-ray photographs of the fracture in order to find out what extent the case has progressed.

9-give the corresponding name (carpal bones – ankle)

Carpel bones: wrist

Ankle: tarsals

10- what are symptoms for the following diseases? (only two) rickets

Page 27

11- explain the structure of long bone (femur)

Page 4

12- explain the structure of a tooth

Page 10

13- explain the chemical structure of bone

Page 6

14- what are the specialties of human skeleton?

Page 26

15- explain the structure of typical vertebrae

Page 14

16- what is fracture ?and what effect on its repairment ?

Page 23

17- write names and number of bones in an upper limbs ?

Upper Limbs The upper limb of human is composed of:

- Humerus:1
- Forearm:2 Ulna and radius
- Hand: 27(Carpal bones:8 Metacarpal bones:5 Phalanges:14)

18- give one example : (hinge joint)

Elbow joint

19- what are the membrane that cover (bone body)

Periosteum

22-Count only: structures support the skeletal system

(ligaments -tendons -cartilage -joint)

21- the sacrum bone consists of ……5……..cohesive bones ,while the coccyx bone consists of ……4……cohesive vertebrae

22-named the scientific term of each of the following:

Thin arch -like bone and it extends between the scapula and the top of sternum

Clavicle

Skeletal system -chapter Review

Periosteum: It is a membrane which covers the outer part of the bone. It contains nerves and blood vessels which nourish the bone

Fontanelle: are spaces in child's skull which are located between the bones of head and they are covered with fibrous cartilaginous tissue

Joint: The meeting point of two bones in the body it is the connection of two bones .

True ribs: they are the first seven pairs of ribs, which are directly connected with the sternum by way of small cartilaginous pieces at the front side.

Sternum: It is a flat bone which consists of three cohesive bones. It is located in front of the chest and from the sides, the true ribs are joined to the sternum by cartilaginous pieces.

Cartilages: They are white colored, transparent and strong structures. They can bend without breaking and they cover the head of bone.

Dentine: is the basic substance of a tooth and it is very solid substance because it contains calcic materials. A tooth is made up of dentine

Fracture: Fracture is the division of bone to two parts or more. It takes places as a strong sudden contraction of muscles or when the bone is exposed to a direct external shock as the fall of hard body on the bone or when a bullet hits it or caused by some diseases like tuberculosis and cancer .

Haversian canal: It is a central canal in the bone through which blood vessels passes and bone cells are arranged in the form of the circles around this canal , this canal discovered by the scientist Clapton havers .

Q2-Write the causes of the followings.

1- these cartilages enable the vertebral column to bend to different sides and they facilitate the movement of vertebrae. Also they prevent the friction of vertebrae.

2-they are important in the process of respiration since they facilitate the movement of the thoracic cage

3- This helps human in walking with wide paces

4-Because it contains calcic materials.

Q4-Answer the followings

a. **Axial Skeleton Axial skeleton is composed of skull, vertebral column and thoracic cage (sternum and ribs). Appendicular Skeleton This skeleton is composed of double bones, which are located on both sides of body. Bones of the limbs are jointed to the axial skeleton by means of two girdles; shoulder girdle and pectoral girdle .**

b.

1-**Cervical region: 7 bones**

2-**Thoracic region: 12 bones**

3-**Lumbar region: 5 bones**

4-**Sacral region: 5 bones**

5-**Coccygeal region: 4 bones**

c. **Thoracic Cage (chest) It consists of ribs and sternum. Ribs Human has twelve pairs of ribs, which are articulately connected with the thoracic vertebrae (12vertebrae) at the back side. But at the front side, the first seven pairs of ribs are directly connected with the sternum by small cartilaginous pieces. These ribs are called as true ribs. After that, the three pairs of ribs are not connected to the sternum directly. Firstly they connect with the cartilage of the seventh rib and then they are together joined to the sternum by small cartilaginous pieces. These ribs are called as false ribs. The last two pairs of ribs are not joined to anything at the front. Therefore, they are called as free ribs. The cartilaginous pieces are the cartilagelike structures, which present in the front side of the true and false ribs. They are important in the process of respiration since they facilitate the movement of the thoracic cage. Sternum It is a long level structure which consists of three cohesive bones and it is found in the front of the chest.**

Its lower end is pointed. From the sides, the true ribs are joined to the sternum by cartilaginous pieces

d. **The upper limb of human is composed of bones of the upper arm, fore arm and hand.**

e. **Lower Limbs Lower limbs are made up of bones of femur, leg and foot.**

f.

1. **The balance of the skull over the vertebral column**

2. **The vertebral column is delicate at the neck region and wide at sacral region**

3. **Wideness of pelvis in human**

4. **Length of the lower limbs in respect to the upper ones**

5. Presence of Bending at the hollow of the foot

g. It happens after a strong sudden contraction of muscles like the fracture of patella in case of contraction of the muscle, which is connected to patella. It happens when the bone is exposed to a direct external shock such as the fall of hard body on the bone or when a bullet hits it. Also fracture happens when a bone faces a powerful shock or bone decaying because of a disease like bone tuberculosis, cancer etc.

h. Chemically, a bone consists of two major kinds of material. Organic matters: The percentage of organic matters is %35. They are colloidal proteins known as collagen and a mucous-like substance called as Mucole. Mucole resembles the albumin (white of egg) and it flows from the bone in case of fracture. It is important for bone flexibility. Inorganic matters: The percentage of inorganic matters is %65. They are phosphate, carbonate, calcium florid, manganese phosphate and sodium chloride (food salt). Calcium salts constitute a high rate in bones. They are responsible for hardness of bones.

Q6-Write the place of the followings

a- The vertebral column consists of 33 vertebrae, each one is composed of a wide part **body or centrum** .

b- The forearm consists of two bones; **ulna** and **radius** and the leg consists **of fibula** and **tibia.**

c- The joints present in the skull are **immovable joint** .

d- Thoracic region consists of **12 pairs** vertebrae and it is connected with ribs.

e- Each finger is composed of **3 phalanges** except the thumb which consists of **2 phalanges**.

f- The skeleton consists of **axial skeleton** and **appendicular skeleton.**

g- The pectoral girdle consists of two bones in each side, they are **Scapula** and **clavicle.**

h- The tooth is made up of three regions. They are **crown**, **neck and root.**

Patella : It is located in front of the knee joint.

Scapula: It is located in the backside of the body outside the ribs and jointed to the muscles of the shoulder

Haversian canal: It is located in the bone

Sacrum: It is located in vertebral column

Q7-Give an example for each of the followings.

Immovable joint: All cranial and facial bones with the exception of the mandible are immovable.

Ball and socket joint: Examples include the joint of the shoulder and hip

A bone disease: Rickets

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