وزارة التعليم العالي والبحث العلمي
الجامعة التقنية الشمالية
المعهد التقني الطبي كركوك

الحقيبة التعليمية

القسم العلمي:	**تقنيات صحة المجتمع**
اسم المقرر:	**علم وظائف الاعضاء**
المرحلة / المستوى:	**الاول**
الفصل الدراسي:	**الثاني**
السنة الدراسية:	**2024-2023**

معلومات عامة

اسم المقرر:	**علم وظائف الاعضاء**						
القسم:	تقنيات صحة المجتمع						
الكلية:	المعهد التقني كركوك						
المرحلة / المستوى	الاول						
الفصل الدراسي:	الثاني						
عدد الساعات الاسبوعية:	نظري	2	عملي	2			
عدد الوحدات الدراسية:	4						
الرمز:	TIK106						
نوع المادة	نظري		عملي		كلهما	نعم	
هل يتوفر نظير للمقرر في الاقسام الاخرى	لايوجد						
اسم المقرر النظير	لايوجد						
القسم	لايوجد						
رمز المقرر النظير	لايوجد						

معلومات تدريسي المادة

اسم مدرس (مدرسي) المقرر:	ا.م.د. ليلى عبد الستار صادق
اللقب العلمي:	**استاذ مساعد**
سنة الحصول على اللقب	2018

الشهادة :	دكتورا
سنة الحصول على الشهادة	2012
عدد سنوات الخبرة (تدريس)	17 سنة

الوصف العام للمقرر

يشمل هذا المقرر دراسة فسيولوجيا كل جهاز من اجهزة جسم الانسان تبدأ من اصغر وحدة حية هي الخلية مرورا بالأنسجة وتنتهي بأجهزة الجسم المختلفة وهي جهاز الدوران , الهضمي , التنفسي , البولي , العضلات , العصبي و الغدد الصماء ويسمح للطالب فهم بعض الامراض التي تصيب الاجهزة التي ذكرت انفا.

الاهداف العامة

- سيتعلم الطالب معرفة وظائف الاعضاء في جسم الانسان والخصائص الحيوية التي تتميز بها وهناك عديد من الامثلة الفسلجية يذكر للطالب منها المعدلات الطبيعية مثل عدد ضربات القلب , عدد مرات التنفس, معدل ضغط الدم وغيرها .
- سيتعلم الطالب دراسة انواع الانسجة في جسم الانسان .
- سيتعلم الطالب دراسة انواع وتركيب ووظائف الخلية وهي المكون الاساسي لبناء الكائن الحي.
- سيتعلم الطالب مكونات وانواع ووظائف اجهزة جسم الانسان بشكل طبيعي (الدم ومكوناته , جهاز الاوعية الدموية والقلبية (جهاز الدوران) , الجهاز التنفسي , الجهاز الهضمي , الجهاز البولي , الجهاز العصبي , الجهاز العضلي , الجهاز التناسلي , الغدد الصماء)

الأهداف الخاصة

يهدف هذا المقرر إلى إكساب الطلبة المعلومات المرتبطة بعلم وظائف الاعضاء الوصفي والوظيفي ووظائف اجهزة الجسم المرتبطة به والتي تشمل:

1. سيكون الطالب قادرا على تعريف الدم ومكوناته وانواعه المعدلات الطبيعية لكريات الدم الحمر وخلايا الدم البيض والصفيحات الدموية مراحل تخثر الدم .
2. سيكون الطالب قادرا بالقيام بإجراء فحص وتحديدفصائل الدم وعملية المطابقة
3. سيكون الطالب قادرا على التعرف عل وظائف اجهزة الجسم (الجهاز التنفسي-- الهضمي – العضلي – التناسلي) ووظائف الغدد الصماء..

أمثلة الأهداف التعليمية.

- إكساب المتعلم مهارات القراءة .
- إلمام المتعلم بمعرفة أجهزة جسم الانسان ووظائفه .

أمثلة أهداف تدريسية:

بعد الانتهاء من الدرس (المحاضرة) سيكون الطالب قادرا على ان:

- يعرف تعريف الدم ومكوناته .
- يميز الطالب بين خلايا الدم .
- يتعلم مكونات جزيئة الهموكلوبين.
- يقيم عملية التطابق بين فصائل الدم

المتطلبات السابقة

- يجب ان يسجل في مقرر التشريح العام في الفصل الاول.

الأهداف السلوكية او نواتج التعلم

ت	. تفصيل الهدف السلوكي او مخرج التعليم	آلية التقييم
3-1	أن يميز الطالب أنواع الدم ووظائفه واعدادها الطبيعية في جسم الانسان وفصائل الدم.	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
6-4	ان يعرف الطالب مكونات صمامات القلب وانواعها وانواع اصوات القلب وتعريف ضغط الدم والمعدل الطبيعي والعوامل التي تحدد ضغط الدم والعوامل المؤثرة عليها	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
7	ان يستعرض الطالب مكونات ووظائف الجهاز التنفسي والحجوم التنفسية.	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
8	ان يعرف الطالب انواع الحجوم التنفسية .	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
9	ان يعرف الطالب مكونات الجهاز البولي ووظائفه ومراحل عملية تكوين البول .	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
10	ان يعرف الطالب مكونات الجهاز الهضمي ووظائفه والاعضاء الملحقة به	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
11	الاعضاء الملحقة الكبد , البنكرياس ,والغدد اللعابية .	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
12	ان يعرف الطالب مكونات الجهاز العصبي ووظائفه والاقسام الرئيسية	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
13	ان يتعلم الطالب مكونات لجهاز العصبي الذاتي.	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة

14	ان يعرف الطالب انواع الجهاز العضلي ووظائفه الحركية والعضلية	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة
15	ان يعرف الطالب مكونات الغدد الصماء وانواعه ووظائفه .	الاختبارات والامتحانات ،التقارير ، النقاشات، الملاحظة

أساليب التدريس (حدد مجموعة متنوعة من أساليب التدريس لتناسب احتياجات الطلاب ومحتوى المقرر)

الاسلوب او الطريقة	مبررات الاختيار
1. التنظيم التقليدي (المحاضرات مباشرا)	وذلك لتنظيم الوقت وسهولة التنفيذ والوضوح وللسيطرة على الفصل الدراسي والحفاظ على النظام والتركيز
2. التعليم التعاوني	وذلك لتعزيز مهارات التواصل وتنمية مهارات العمل التعاوني وزيادة الدافعية والتحفيز
3. الاستقصاء	وذلك لتنمية مهارات البحث والتحليل وتطوير التعلم الذاتي والاستقلالية
4.المناقشة والحوار	وذلك لتطوير مهارات التفكير النقدي وتعميق الفهم ويعزز الابتكار والابداع

مفهوم علم وظائف الاعضاء							
عنوان الفصل	الوقت						
التوزيع الزمني	النظري	العملي	العنوان الرئيسي	العنوان الفرعي	طريقة التدريس	التقنيات	طرق القياس
الأسبوع الأول	2 ساعة	2 ساعة	مفهوم علم وظائف الاعضاء	أساسيات الحياة و الخلية و مكوناتها و انواعها و الوظائف الاساسية لها	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
الاسبوع الثاني	2 ساعة	2 ساعة	الدم	الدم تعريفه	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
				مكونات الدم			
				كريات الدم الحمر			
				خلايا الدم البيض			
				الصفيحات الدموية			
				البلازما			
				جزيئة الهيموكلوبين			
				عوامل تخثر الدم			
				فصائل الدم			

	الوقت		جهاز الدوران والجهاز التنفسي				
	النظري	العملي	العنوان الرئيسي	العناوين الفرعية	طريقة التدريس	التقنيات	طرق القياس
الاسبوع الثالث والرابع والخامس	2 ساعة	2 ساعة	جهاز الدوران	تركيب القلب والاوعية الدموية	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
				انواع الصمامات			
				اصوات القلب			
				الدورة القلبية			
				الطرح القلبي			
				ضغط الدم			
				انواع ضغط الدم			
				العوامل التي تحدد ضغط الدم			
				العوامل التي تؤثر على ضغط الدم			
الاسبوع السادس والسابع	2 ساعة	2 ساعة	جهاز التنفسي	التنفس	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
				الوظائف الاساسية له			
				الجزء العلوي للجهاز			
				الجزء السفلي للجهاز			
				طبقات الرئتين			
				أنواع و ميكانيكية التنفس			
				انواع التهوية الرئوية			
				الحجوم التنفسية			

			السعات الرئوية التنفسية				
			جهاز قياس السعات				
			كيفية حساب السعات				

عنوان الفصل	الوقت						
التوزيع الزمني	نظري	عملي	العنوان الفرعي		طريقة التدريس	التقنيات	طرق القياس
الاسبوع الثامن والتاسع	2 ساعة	2 ساعة	الجهاز العصبي	الخلايا العصبية و أنواع الاعصاب	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
				الجهاز العصبي المركزي (الدماغ و الحبل الشوكي			
				الاعصاب الطرفية في الجسم			
				جهاز العصبي الذاتي ووظائفه،			
				النواقل الكيميائية العصبية			
				السحايا الدماغية			

			طبقات السحايا				
الاسبوع العاشر والحادي عشر	2 ساعة	2 ساعة	تركيب الجهاز الهضمي	الجهاز الهضمي وملحقاتها	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
			الهضم وانواعها				
			الغدد اللعابية				
			المعدة واقسامها				
			أنزيمات المعدة التي تساعد على الهضم				
			البنكرياس وانزيماتها				
			هرمونات البنكرياس				
			الامعاء الدقيقة				
			الامتصاص والعوامل المساعدة على الامتصاص				
			الامعاء الغليظة				
			الكبد				
			كيس الصفراء				
			قناة الصفراء				

الفصل الرابع (من المحتوى العلمي)							
عنوان الفصل	الوقت						
التوزيع الزمني	نظري	عملي	العناوين الرئيسية	العناوين الفرعية	طريقة التدريس	التقنيات	طرق القياس
الأسبوع الثاني عشر والثالث عشر	2 ساعة	2 ساعة	الجهاز البولي الجهاز التناسلي	مكونات الجهاز البولي ووظائفه	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
				لتركيب التشريحي للكلية			
				تركيب ووظائف التفرون			
				الترشيح الكلوي			
				اعادة الامتصاص			
				الافراز			
				الجهاز التناسلي الذكري			
				الجهاز التناسلي الانثوي			
				انبساط العضلات			
الاسبوع الرابع عشر	2 ساعة	2 ساعة	الغدد الصماء	مقدمة عن جهاز الغدد الصماء و الهرمونات.	محاضرة	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
				ميكانيكية تأثيرها على خلايا الهدف في الجسم			
				تركيب الغدة الدرقية و الغدة الجار درقية			

			الأدرينالين و الوظائف الحيوية في الجسم			
			الغدة النخامية			
الاسبوع الخامس عشر	2 ساعة	2 ساعة	العضلات وانواعها	الجهاز العضلي	عرض تقديمي، شرح، أسئلة وأجوبة, مناقشة	الاختبارات القصيرة ،الاسئلة والمناقشة ، تحليل الردود
			انقباض العضلات			
			انبساط العضلات			

خارطة القياس المعتمدة

المحتوى التعليمي	عناوين الفصول	الأهمية النسبية	الأهداف السلوكية					عدد الفقرات
			المعرفة	الفهم	التطبيق	التحليل	التقييم	
			%20	%25	%20	%15	%20	
الفصل الاول	مقدمة في علم وظائف الاعضاء الدم	%13	1	1	1	1	1	5
الفصل الثاني	جهاز الدوران – ضغط الدم – الجهاز اللمفاوي	% 20	2	3	2	1	2	10
الفصل الثالث	الجهاز التنفسي الجهاز العصبي	%20	2	2	2	1	2	5
الفصل الرابع	الجهاز الهضمي الجهاز البولي	%20	1	2	1	1	1	10
الفصل الخامس	الغدد الصماء الجهاز العضلي	%27	2	2	2	2	2	10
المجموع		%100	8	10	8	6	8	**40**

المحتوى العلمي

المحتويات (لكل فصل في المقرر)

رقم المحاضرة :	الاولى
عنوان المحاضرة:	مقدمة في علم وظائف الاعضاء
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
الفئة المستهدفة :	طلاب المستوى الاول
الهدف العام من المحاضرة :	
الأهداف السلوكية او مخرجات التعلم:	1-التعرف على تعريف علم وظائف الاعضاء 2-التعرف على انواع الانسجة في جسم الانسان
استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم على الخلية , الانسجة , الاعضاء , الاجهزة , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

- الاسئلة القبلية.:

Q1:Define physiology.

Introduction to the human physiology

Physiology:

Is the science that deal with the structure and function of the living body organs.

Living body (human) consist of many systems. Every system consist of many organs, the organ consist of certain type of tissues, and the tissues consist of specialized cells**.**

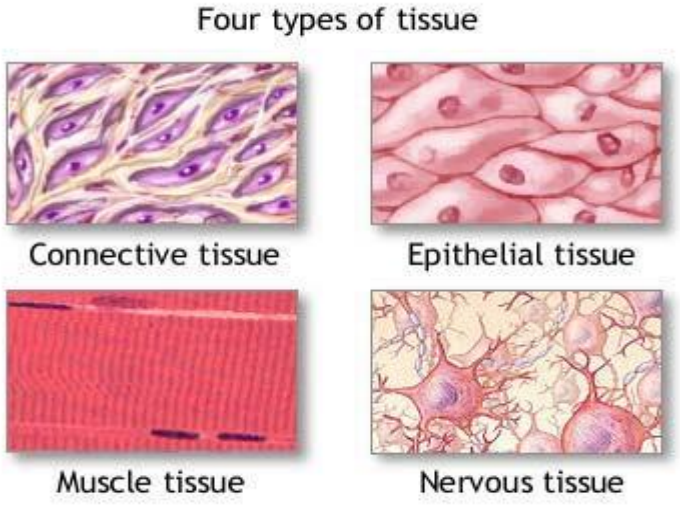
Physiology: is the study of normal biological function, from cell to tissue ,tissue to organ ,and organ to system ,as well as how the organism as a whole accomplishes particular tasks essential to life.

Types of body system :

They are Integumentary System, Skeletal System, Muscular System, Nervous System, Endocrine System, Cardiovascular System, Lymphatic System, Respiratory System, Digestive System, Urinary System, and Reproductive System (Female and Male).

Types of body tissue

There are 4 basic types of tissue: connective tissue, epithelial tissue, muscle tissue, and nervous tissue.



الاسئلة البعدية

Q1: Enumerate types of body tissue.

Q2: Enumerate types of body system.

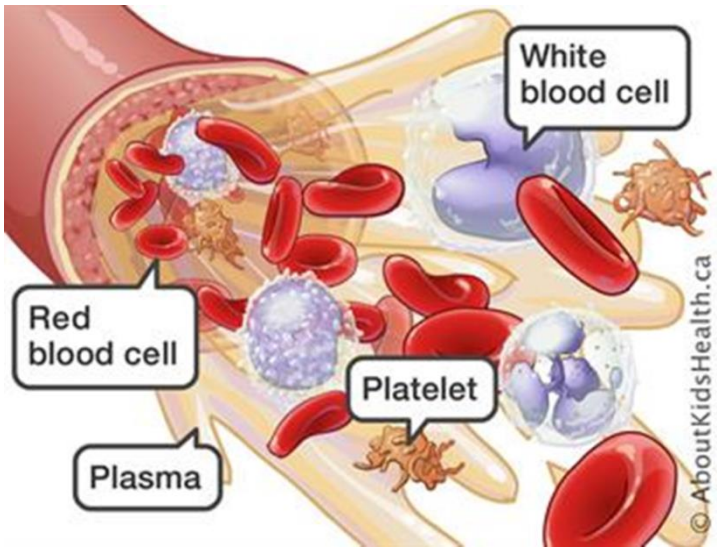
رقم المحاضرة :	الثانية
عنوان المحاضرة:	الدم
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
الفئة المستهدفة :	طلاب المستوى الاول
الهدف العام من المحاضرة :	
الأهداف السلوكية او مخرجات التعلم:	1-التعرف على مكونات الدم 2-التعرف وظائف الدم ومكوناتها 3- معرفة فصائل الدم
استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم على خلايا الدم واشكالها ووظائفها , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

Q1 : Define of the followings : blood ,Red blood cell , white blood cell.

Blood

Properties

- Classified as connective tissue, but it's cells are not fixed.
- Red viscid fluid.
- Contain colorless fluid called plasma.
- Composed of RBC (erythrocytes), WBC (leucocytes) and platelets (thrombocytes).
- Is about 1/12 of body weight.
- Volume in adult about 51itres, but in new burn about 300ml.



Functions:

1- Transportation: transport oxygen, from lung to the body tissues and of carbon dioxide from the lung .

2-Transport of absorbed food materials.

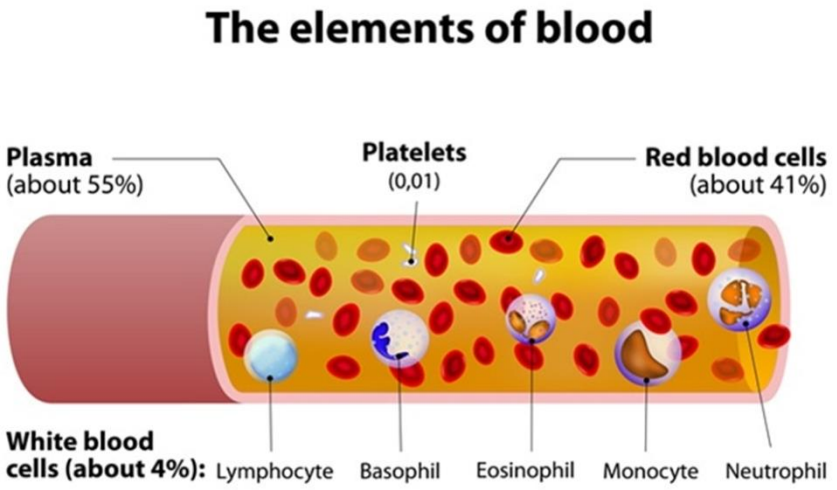
3- Help in maintain a constant body temperature – by convey heat produced by liver and muscles.

4- Body defense – by lymphocytes and granulocytes.

5- Maintain a constant internal PH at 7.4.

6- Help in maintain osmotic pressure.

7-Transport of hormones.



Origin of blood cells :

RBC,WBC and platelet are formed from stem cells of red bone marrow , which can develops into different specialized cells including blood cells

Also lymphocytes develop in lymphoid tissues, and reticulo-endothelial tissue of (spleen, liver, lymph nodes) also the reticulo-endothelial tissue can produce the monocytes.

Illustrate that in diagram

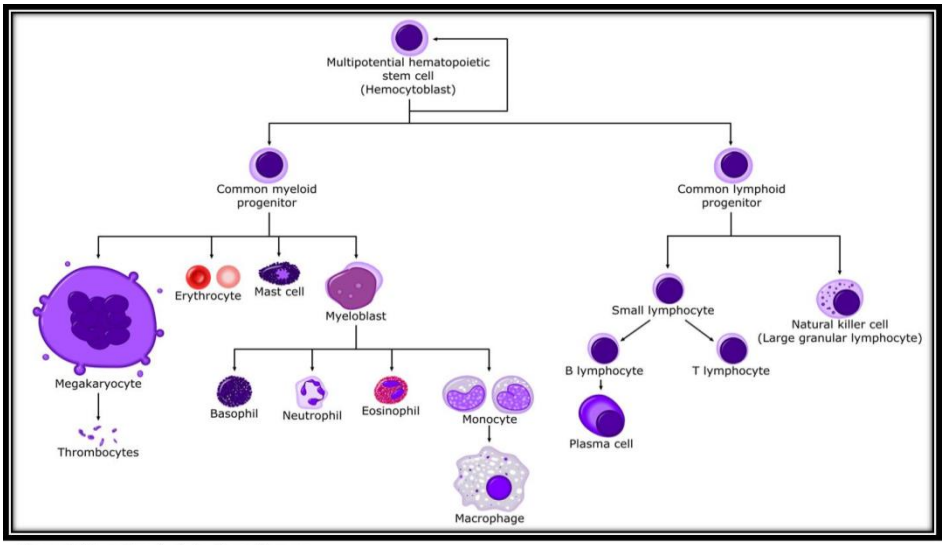
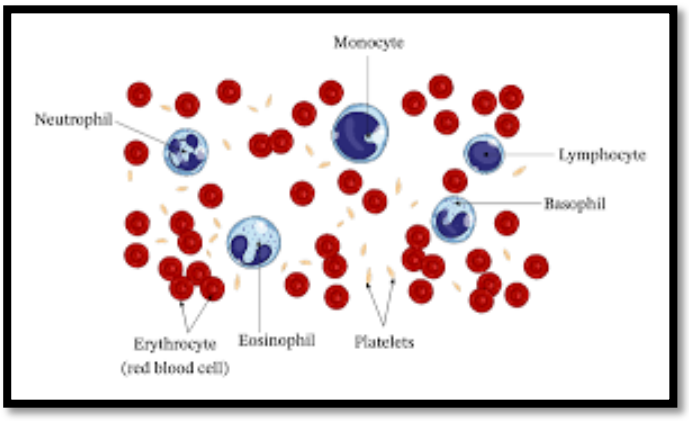


Figure 1: Hematopoiesis in Bone Marrow

1- Types of blood cells :

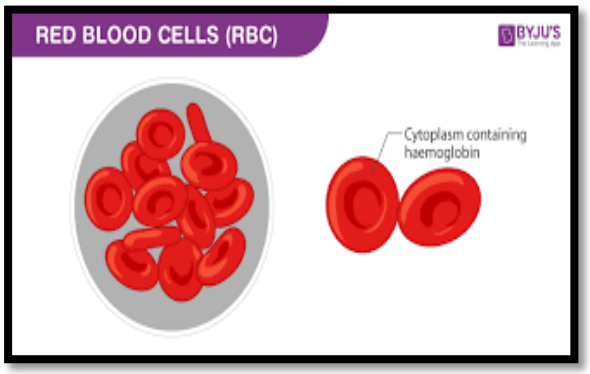
It is about 45% of the blood volume and perfume different functions , which are : RBC ,WBC , and platelets.

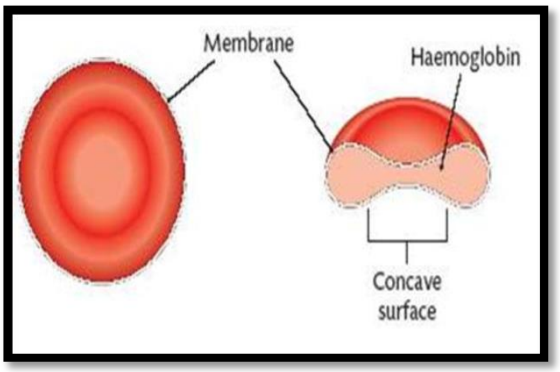


Red blood cells (RBC)

1- Formed in the bone marrow of ribs, sternum and vertebrae.
2- Biconcave disc shaped.
3- Mature cells without nucleus.

4- It is cytoplasm filled with pigment (Hemoglobin).
5- Span life about 100-120 days.
6- Broken down in the liver or spleen, It's iron and protein being recovered for further use.
7- Main function is to transport O_2 and CO_2 .
8- It is thickness 2μ and diameter 7μ, with a central area thinner than edges.
9- Count in male 5.5 million / mm3, in female 4.5 million / mm3 .





RBC Formation :

About 1% of red cells in the body have to be replaced each day, and the new cell formation need certain items in the diet, such as :

1- Iron : additional to that present , about 5mg iron / day will be required for a man , and 10mg iron / day for women (due to loosen with the blood in menstrual period)
2- Protein : to supply amino acid .
3- Folic acid and vitamin B_{12}: (B_{12} absorbed in the intestine depend on (intrinsic factor))

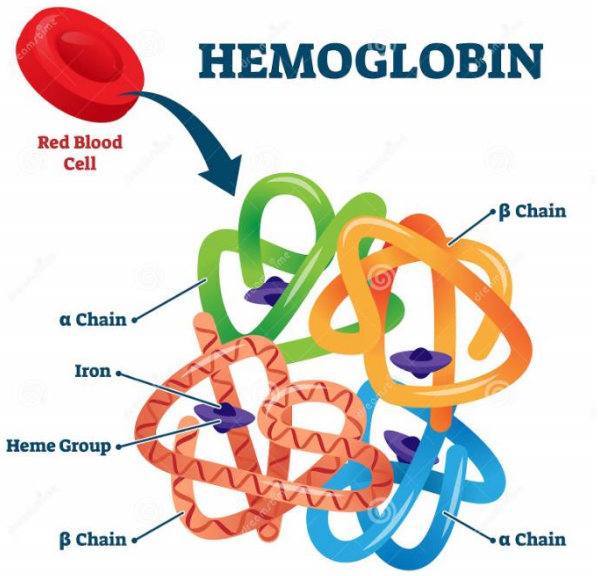
Deficiency of any of these materials in the diet cause anemia
But Polycythemia is a disease characterized by a surplus of RBC.

Erythropoietin :

Is a substance released by the kidney in response to a sustained shortage of oxygen in the body, which induce the red bone marrow to produce RBC , as in anoxia.

Hemoglobin :

It is a pigment, which is bright red in color when combined with oxygen and dark blue in color when there is no oxygen present.



Normal value

The blood of a normal person contain approximately 15 grams of hemoglobin in each 100 ml of blood , and each gram of hemoglobin combine with a maximum of about 1.34ml of oxygen .

Composition

There are 4 separate iron atoms and globin molecule in each hemoglobin, each of these combined with one molecule of oxygen . Important feature of hemoglobin molecules is it's ability to combine loosely and reversibly with oxygen.

Red cell break down :

After 100 – 120 days old of red cells are taken up by a series of phagocytic cells, which is found in bone marrow , spleen , liver and all parts of the body , then Hb is converted by these cells into a yellow pigment 13lycoprot , which passes via blood and exerted into the bile and to the duodenum, and the iron returns for farther RBC formation.

The diagram below illustrate that :

RBC

(after 100 – 120 days old)

↓

destroyed by the phagocytic cells, and releases

↓

Hb

↓

Heme globin

↓

Iron (4 atoms)

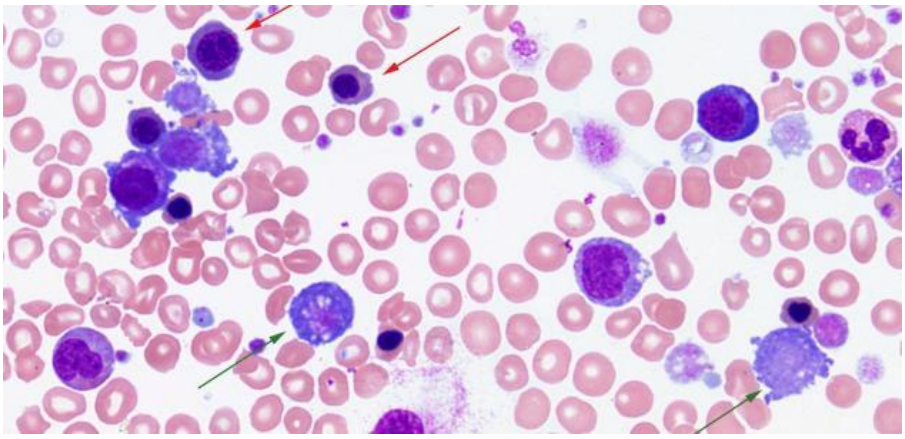
pigment (14lycoprot)

↓

Exert into liver (bile sac)

then into (duodenum)

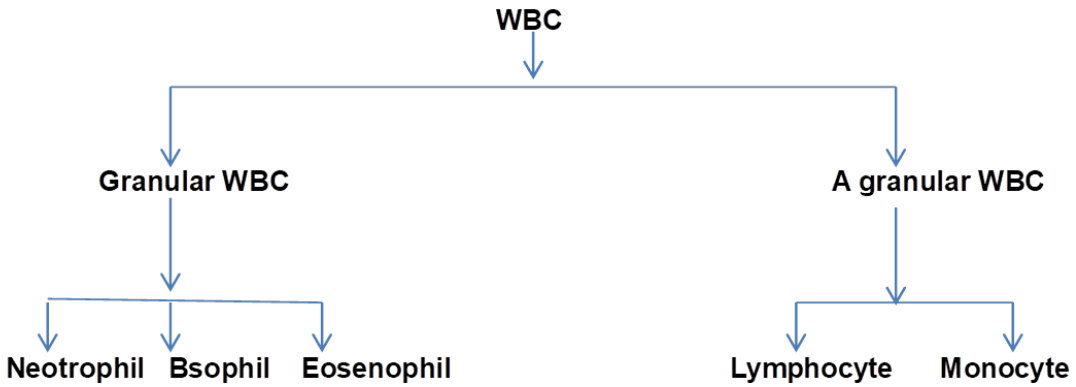
Leukocyte:



White blood cell (WBC or leucocyte)

1- are several kinds , differ in structure and origin.
2- all have a large nucleus.
3- concern with body defense .
4- it is count from 4000 – 11000 in cubic millimeter.
5- life span from 6 hr. to several days .

Types:

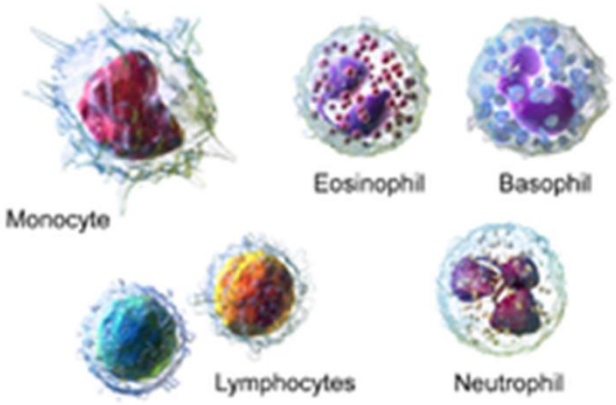


Granulocyte :

Divided in to 3 types – all are phagocytic
(Neutrophil , Basophil , Eosinophil)

Neutrophils :

1- It is number are 65% of total number of WBC.
2- Consider as body's first line of defense ,seek out and kill bacteria.
3- Half life is 6 hour's .
4- Many of 15 lycoprote leave the circulation and enters the tissues , by squeezing
themselves through the pores of the capillaries wall by a process called diapedesis and reach infected area , since an agents was produced by the interact between bacterial products and plasma factors (chemotaxis) .



White Blood Cells

Basophils :

1 – it is numbers are 1% of WBC number.
2 – contain histamine and heparin.
3 – also phagocytic .

Eosinophils :

1 – it is numbers are 4% of total number of WBC.
2 – also phagocytic .
3 – increase in patients with allergic disease .

A granulocytes :

divided into two types – about 30% of total number of WBC.

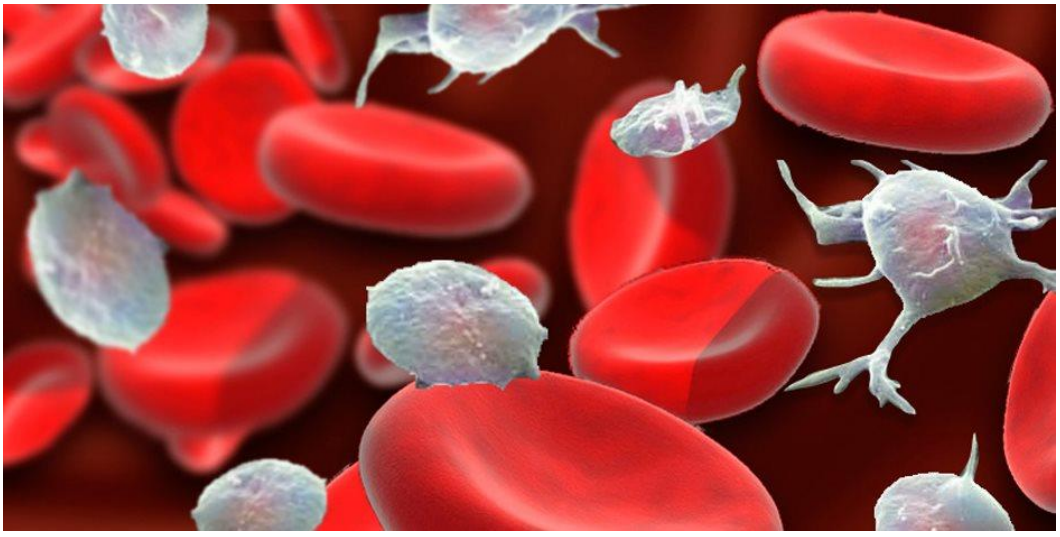
Monocytes :

1 – about 5% of WBC .
2 – larger than granulocytes.
3 – have kidney –shaped nucleus.
4 – are phagocytic cell , able to engulf bacteria and foreign particles , by follow the neutrophil to the infected area . after 24hours of entering the circulation they enter the tissues to become tissue macrophages , here called the " reticloendothelial system " . Tissue macrophages including the kupffer cells of the liver and alveolar macrophages of the lung.
5 – are migrate in response to chemo static stimuli ,and engulf and kill bacteria .:

Lymphocytes :

1 –besides bone marrow also formed in lymphoid tissue, thymus, spleen.
2 – smaller than granules , have very large spherical nucleus.
3 – enter the circulation via thoracic duct .
4 – do not act as phagocytic , instead they act as antibody which react with foreign body called antigens and destroy them .
5 – play a key role in immunity .

Platelets:



Platelets :

Are small cellular fragments rather than complete cells

Function: It was important in coagulation of blood .

Number: Between 250.000 – 400.000 in cubic millimeter .

Homeostasis :

It is mean a prevention of blood loss. When blood vessel is rapture, then the homeostasis is began ,and it is achieved by several different mechanism including :

1-Vascular spasm (vasoconstriction)

2- Formation of the plug

3- Blood coagulation: (clot formation)

2- Plasma:

It is about 55% of the blood volume , which composed of :

1- Water about 90% of a plasma volume.

2- Protein :

a- albumin.

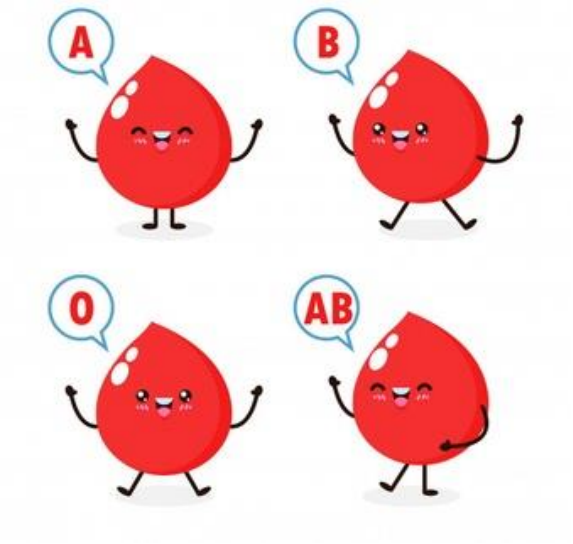
b- clotting factors (fibrinogen).

3- Antibodies.

4- Nutrients as : 1- Carbohydrate (as glucose).
2- Amino acids – product of protein digestion.
3- Lipids.
4- Mineral salts (as sodium, chloride, potassium, phosphate, calcium).

5- Metabolic materials as : enzymes, vitamins , hormones , uric acid , lactic acid.

Blood grouping :



ABO system :

1 – Membrane of each red cell contain *one or two or non* of a variety of *antigens* (called agglutenogens).

2 – Important types of agglutinogens are A and B .

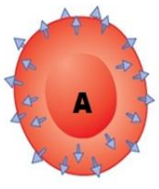
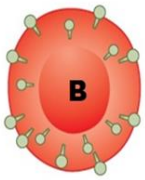
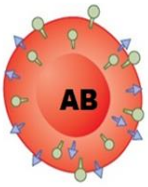
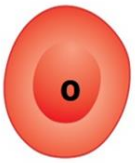
3 – According to that, the individuals divided into 4 blood groups
A, B, AB, O

4 – There are A and B antigens in many tissues other than blood , like salivary gland , saliva , pancreas , kidney , liver , lungs , testis , semen , and amniotic fluid

5 – Agglutinogens A and B are 19lycoproteins (M.W. 8000 or more) that differ in composition by only one sugar residue .

6 – Antibody who against agglutinogen (antigen) called agglutinin , Present in the plasma of the blood .

7 – Agglutinin (antibody) occur : 1- naturally (inherited).
2- by exposure to the RBCs of another individual via :
a- blood transfusion.
b- during pregnancy.

	Group A	Group B	Group AB	Group O
Red blood cells Type				
Antigens on surface of red blood cells	 A Antigen	 B Antigen	 AB Antigen	None
Antibodies in plasma	 Antibody B	 Antibody A	None	 Antibody A & B

Rhesus group (Rh factor):

In addition to the 6 antigens of the ABO system ,there is another substance called antigen- D (agglutenogen)

Peoples who have antigen-D on their red cells membrane are said to be Rhesus positive (Rh+) are about 85% . The remaining 15% have no antigen D on their red cells membrane and said to be Rhesus negative

(Rh -).

Neither the Rh+ nor the Rh- people have any anti- antigen D naturally occurring in their plasma , but anti- antigen D will develop in Rh- person only , if that person is giving a Rh+ transfusion. The anti- antigen D which is formed will persist through out life , and person will not be able to have Rh+ blood.

The Rh+ patients do not have anti- antigen D in their plasma , they can not make anti- D and they can have a transfusion of their Rh- or Rh+ blood.

When a man of Rh+ married a woman of Rh- , and when the wife become pregnant , it's Rh- blood may become sensitized by a proteins from her Rh+ fetus (this factor have been inherited from the father) .If these proteins enter the mother's circulation before or during child birth . During subsequent pregnancy with Rh+ fetus ,some of the anti-Rh antibodies may pass from the mother's blood into the blood of her fetus ,and cause destruction of fetus's red cells . This condition is called "erythroblastosis fetalis " or hemolytic disease of the new born.

Blood clotting :

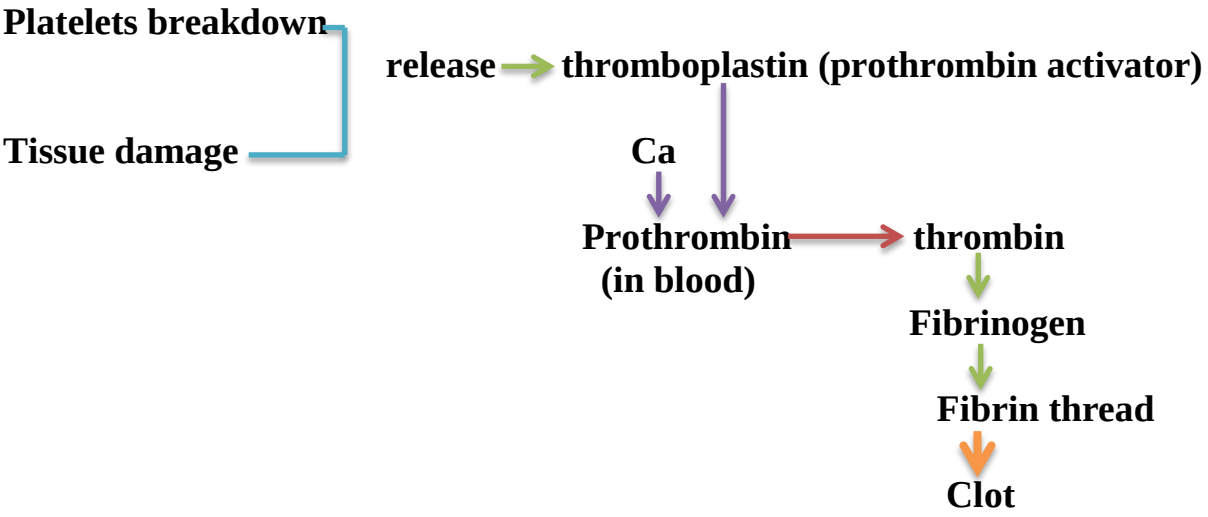
Blood coagulation take place in three essential steps:

First : A substance called prothrombin activator (thromboplastin) is formed in response to rupture of the vessel .

Second : The prothrombin activator catalyzes the conversion of Prothrombin present in the blood into thrombin.

Third : The thrombin acts as an enzyme to convert fibrinogen present in the blood into fibrin threads that enmesh platelets , blood cells ,and plasma to form the clot itself,

Clotting Process



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Blood disorder :

1-Anemia :

Types of anemia :

Anemia caused by low O2 transport capacity

1- **Pernicious anemia** (megaloblastic or macrocytic anemia) : Is made by a deficiency of B_{12} and folic acid . Here the red blood cell are irregular in size , and in general are too big , and there is a shortage of RC .

2- **Iron deficiency anemia :** If iron intake is not sufficient for the body's need. The red blood cells become very pale in color due to the shortage of

hemoglobin . Here red cells are smaller than normal one . Also this type called (hypochromic anemia).

3- **A plastic anemia :** This type was due to an over – dose of ionizing radiation (X-ray). Also this type may cause by some drugs like benzene derivatives . caused by inability of BM to produce RC .

4- **Hemolytic anemia :** Are different types , They are a hereditary , Have a common character which is the cells are very fragile , So that they rupture easily as they go through the capillaries , So the life span of red cell.

2-Polycythemia

Polycythemia, also called erythrocytosis, refers to increased red blood cell mass, noted on laboratory evaluation as increased hemoglobin and hematocrit levels. Polycythemia vera is a subtype of polycythemia

الاسئلة البعدية

Q1 / Complete of the following with suitable statements:

1- Blood Classified as ……tissue, but it's cells are not fixed:
(epithelial , connective, muscle)

2. A prevention of blood loss is mean :
(Hemostasis ,Homeostasis , Hemopoiesis)

3.Basophil release chemical substance in allergic response :
(histamine , thrombin ,hemoglobin)

Q2/ Answer by true or false of the following:

1- Rh^- system are important in blood transfusion. True

Q3 / Enumerate the main functions of blood

رقم المحاضرة :	الثالثة والرابعة والخامسة
عنوان المحاضرة:	جهاز الاوعية الدموية والقلبية
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
الفئة المستهدفة :	طلاب المستوى الاول
الهدف العام من المحاضرة :	
الأهداف السلوكية او مخرجات التعلم:	1-التعرف على مكونات الجهاز 2-التعرف على وظائف القلب 3- التعرف على اصوات القلب 4- التعرف على ضغط الدم 5-التعرف على الجهاز اللمفاوي
استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم مكونات جهاز الاوعية الدموية والقلبية ووظائفها , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

الاسئلة القبلية

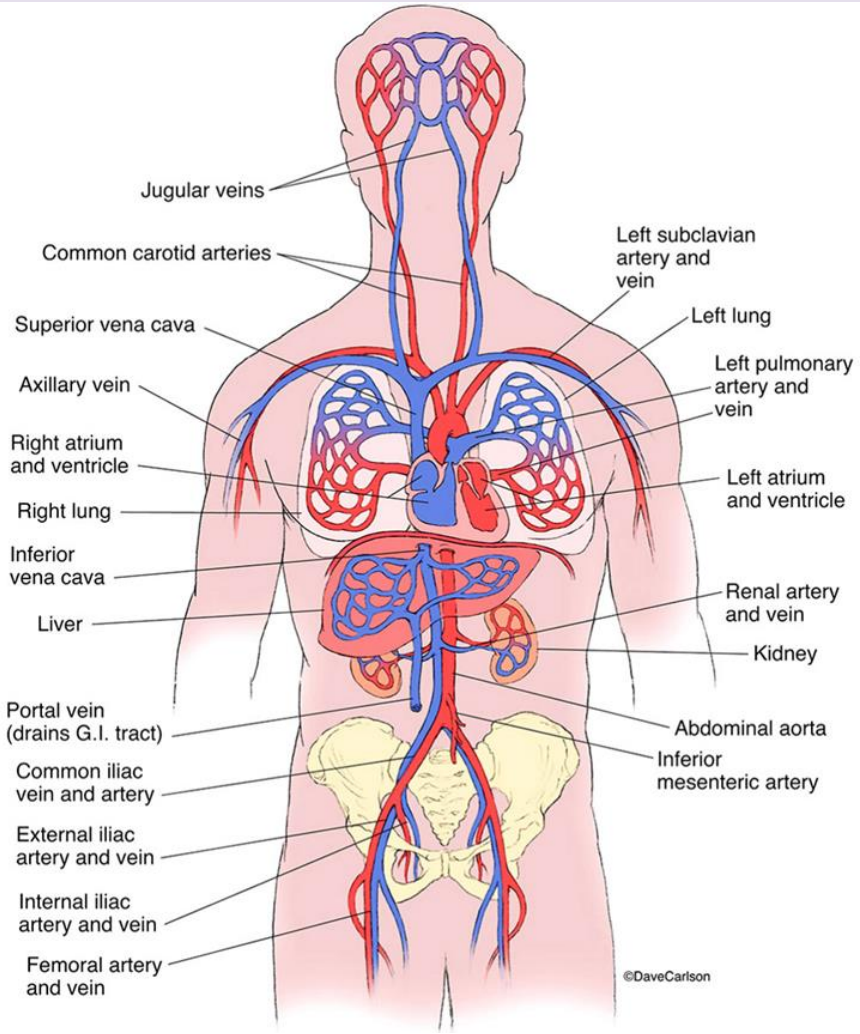
Q1 / Choose the correct answer:

1. The ventricular contraction lasts the:
(0.3 seconds 0.5 seconds 0.7 seconds)

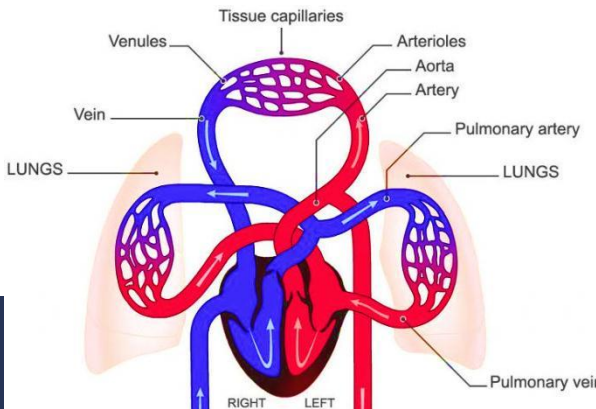
2- Upper side of the heart chamber called:
(ventricle atrium AVC)

3-The second sound of heart is due to the closing of …… .
(semilunar valve , aortic valve , mitral valve)

CARDIOVASCULAR SYSTE



1 - It is a closed system consist of heart and blood vessels .
2 - Filled with circulating blood .
3 - Transport body useful things



(O_2 and nutrient) , and un useful things (Co_2 and other waste products)

4 - Transport hormones from their production to their targets.

5 - Distributes the heat for all body.

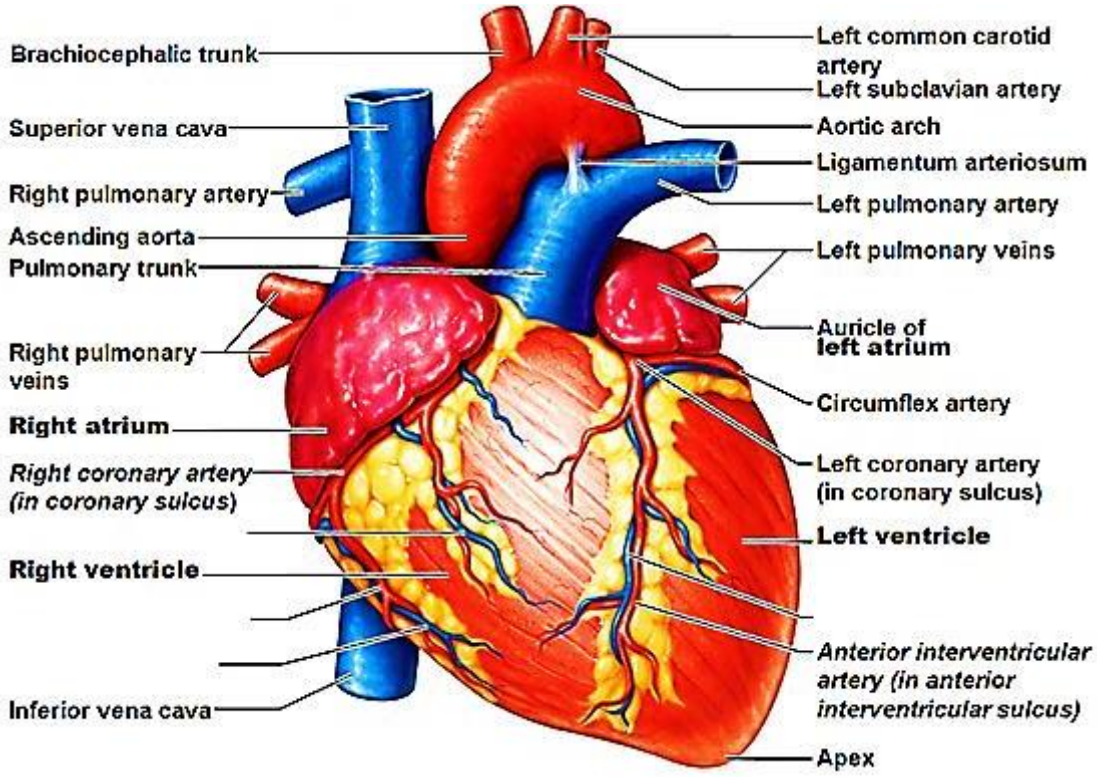
The Heart:

1 - It is a pump which circulates the blood around the body .

2 - In fact , it is tow pumps , the left side pumps blood coming from lungs to the tissues ,and pumps the blood which has been returned from the tissue to the lungs.

3 - Each side of heart consist of two chambers, the atrium and ventricle.

4 -There are a valves between each atrium and ventricle, and at the opening of large vessels .



Cardiac cycle

Cardiac cycle : It is a sequence of one systole followed by one diastole , and it last 0.8 of a second.

Ventricular systole : It is a contraction phase of a ventricular chamber of the heart at rest, which last 0.3 second.

Ventricular diastole : It is a relaxation phase of a ventricular chamber of the heart at rest, and last 0.5 second.

Cardiac Output

Heart Rate: Is the number of beat / minute , which is normally equal 70 beats/min

Bradycardia : is a relatively slow heart rate less than 60 beat/min.

Tachycardia : refers to a heart rate over 100 beat/min

Stroke Volume: At each beat, each ventricle pumps out about 70 ml blood . (Normal person)

Cardiac Output: It is the volume of the blood pumped out by each ventricle / minute. May be represented by the equation:

C.O. = H.R. x S.V. = 70 beat/min x 70ml/beat = 4500 ml/min.

In exercise, the cardiac output is greater than at rest , since the exercise increase the heart rate and stroke volume

Control of the heart rate:

The heat rate can be influenced by :

1- The nervous system :

Stimulation from the sympathetic nervous system increases the heart rate . Stimulation from the parasympathetic nervous system decreases the heart rate.

2- Factors in the internal environment .

3- Hormones , Ions and drugs in the blood

Heart valves

Heart valves : Are structures which allow the blood to flow in one direction only, which are passive structures, they do not contain any muscle tissue

Each ventricle has a valve at its inlet and its outlet ,are:

Inlet valves: named aterio-ventricular valves. On the right side the mitral valve, and on the left side the tricuspid valve.

Outlet valves: Situated at beginning of large vessels, each have three semilunar

structures. On the right side the pulmonary valve. On the left side, the aortic valve. Located at beginning of large vessels.

Heart sounds:-

1- The closure of the mitral and tricuspid valves is associated with a sound can heard by stethoscope, and termed the "first heart sound" and heard like the word "lub" and this sound marks the onset of ventricular systole .

2- The closure of the semilunar valves (aortic and pulmonary) causes the second heart sound, which is like the word "dub". This marks the end of ventricular systole and the start of ventricular diastole.

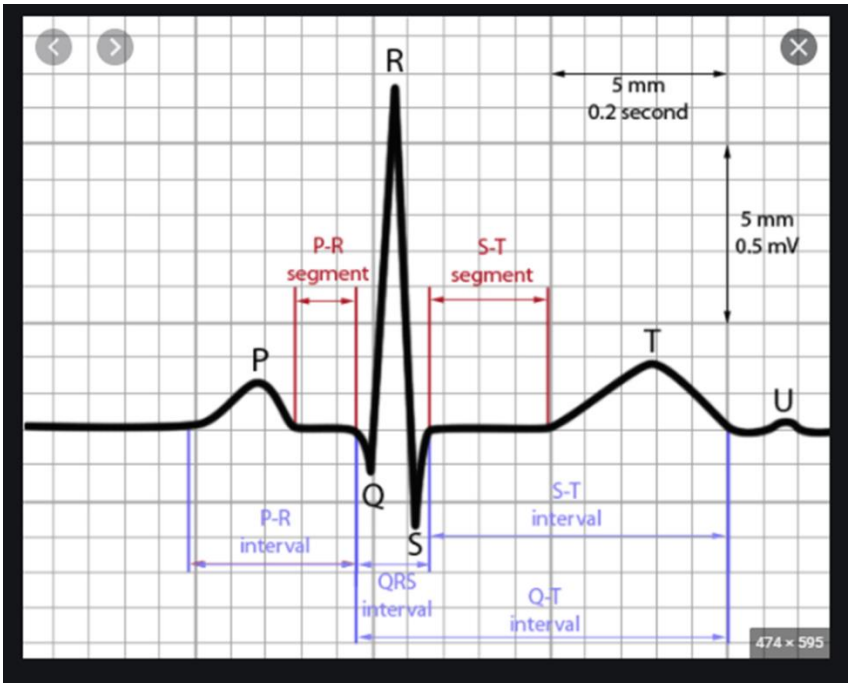
3- Since the interval period of time between the first heart sound and second heart sound is shorter than the interval period of time between the second heart sound and the first heart sound. Here the beating of the heart has characteristic rhythm (lup-dup-pause-lup-dup-pause. . . . .)

Phonocardiography :

An instrument using a microphone attached to the chest, which recording heart sounds, called a phonocardiogram .

The first (1) and second (2) heart sounds is a record of the a closure of the heart valves . The third (3) heart sound which corresponds to a rushing of the blood into the ventricles during diastole .

The fourth (4) heart sound which corresponds to the atrial systole.



Valve areas on the chest can be heard the valves sound :

The heart sounds are heard best where there is no lung tissues between the heart and the chest wall , because the lung was poor conductor of sound. The sound of:

Pulmonary valve is heard best in the region of the second left intercostals space

Aortic valve is heard best under the beginning of the second right rib

Mitral valve is heard best in the region of the fifth intercostals space of median left side

Tricuspid valve is heard best at the lower boarder of the sternum

Heart sounds disease

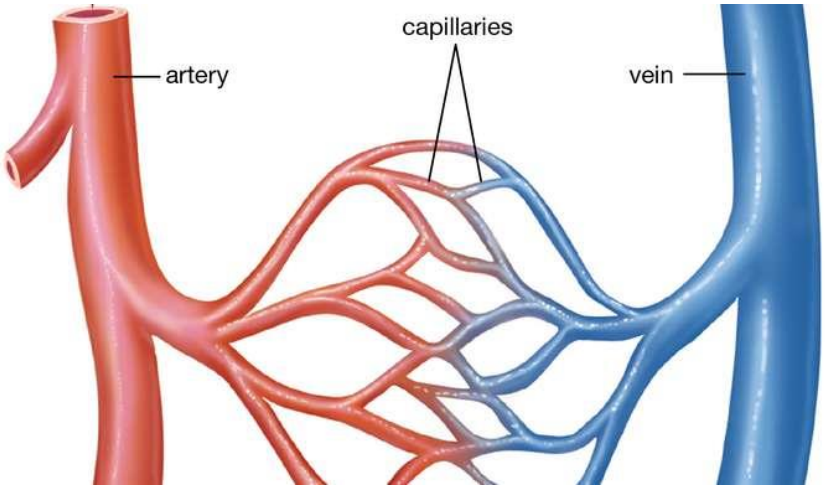
Murmur :

1- Abnormal heart sound usually due to a faulty action of the heart valves (valve fail to close tightly) and blood leaks back (or can not open completely) make a noise sound during passing of blood through narrow opening.

2- Also may be caused by a narrowing of valve opening (stenosis) and this state called incompetence or regurgitation .
3- Also the abnormal sound may be caused by a congenital defects , disease , and physiological variations.

Blood vessel

a vessel in the human or animal body in which blood circulates. The vessels that carry blood away from the heart are called arteries, and their very small branches are arterioles. Very small branches that collect the blood from the various organs and parts are called venules, and they unite to form veins, which return the blood to the heart. Capillaries are minute thin-walled vessels that connect the arterioles and venules; it is through the capillaries that nutrients and wastes are exchanged between the blood and body tissues.



Blood Pressure

Is the force of the blood exert against arterial walls. It is measured in millimeter of mercury (mmHg) using the sphygmomanometer, and composed of :

Systolic blood pressure :- Is the maximum pressure in the aorta and arteries occur during the heart muscle contraction, the average normal value is around 120 mmHg

Diastolic blood pressure :- Is the minimum pressure in the aorta and arteries occur during the heart muscle relaxation, the average normal value is around 80 mmHg.

Control of blood pressure by :

Sympathetic nerves : it's stimulation lead to increase heart rate and then to increase the blood pressure .

Parasympathetic nerves : it's stimulation lead to decrease heart rate and then to decrease the blood pressure .

Baro-receptors : which sense the changing in blood pressure.

Factors determine the blood pressure :

In order to have B.P. there must be : increase C.O. lead to increase B.P.
Cardiac out put (C.O): C.O.=stroke volume × heart rate .
is a resistance to blood flow in systemic circulation ,

Peripheral resistance : which is produce by :

Vascular wall : decrease of the cross section of the vessel lead to increase of the blood pressure (vasoconstriction) , and vice versa

Blood volume : the decrease of the blood volume (as in bleeding) lead to decrease of the blood pressure

Blood viscosity : Increase of the viscosity of the (as in polycythemia) lead to increase of the blood pressure

Factors affecting the blood pressure :

1) Sex : blood pressure is higher in male
2) Age : blood pressure is higher in elderly
3) Body weight : higher weight leads to higher blood pressure
4) Gravity : the pressure in the legs is higher than the pressure in the head
5) Posture : pressure at lying is higher than sitting , and this is higher than at standing .
6) Excitement.
7) Muscular activity : Blood pressure was high
8) Rest and sleep : Blood pressure is less
9) Some drugs : alcohol , adrenaline increase Blood pressure
10) Some condition : as bleeding and anesthesia decrease Blood pressure

Abnormalities of Blood pressure :

1) **Hypertension :** It is an increase of the blood pressure , where are :
a) Systolic blood pressure – was more than 150 mmHg .
b) Diastolic blood pressure – was more than 90 mmHg .

There are three types of high blood pressure , which are :
1- Artrio sclerosis – due to presence of cholesterol and Ca salt in the wall of blood vessels.
2- Renal hypertension – due to renal ischemia .
3- Essential hypertension – cause unknown .

2) **Hypotension :** It is a decrease in blood pressure , where are :
a) Systolic blood pressure below 100 mmHg .
b) Diastolic blood pressure below 70 mmHg .

The cause of hypotension may be due to :
1- Hemorrhage.

2- Diarrhea.
3- Sever vomiting.
4- Sever burns.

الاسئلة البعدية

Q1/ Answer by true or false of the following:

1-Hypertinsion,occurs when blood pressure increases to unhealthy levels.
2- The closure of the semilunar valves causes the second heart sound .

Q2/ Define cardiac cycle.

رقم المحاضرة :	السادسة والسابعة
عنوان المحاضرة:	الجهاز التنفسي
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
الفئة المستهدفة :	طلاب المستوى الاول
الهدف العام من المحاضرة :	
الأهداف السلوكية او مخرجات التعلم:	1-التعرف على وظائف الرئيسية للجهاز التنفسي 2-التعرف على مكونات الجهاز التنفسي 3- التعرف على الحجوم التنفسية
استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم على مكونات الجهاز التنفسي ووظائفه , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

الاسئلة القبلية

Q1 / Choose the correct answer:

1- Which of these lung volumes capacities is the largest ..... .
(residual volume , tidal volume , vital capacity)

5-If normal respiration rates for an adult person at rest equal 19 breaths per minute:
(P.V= 7.600 L/ min , P.V= 8.000 L/ min , P.V = 5.600 L/ min)

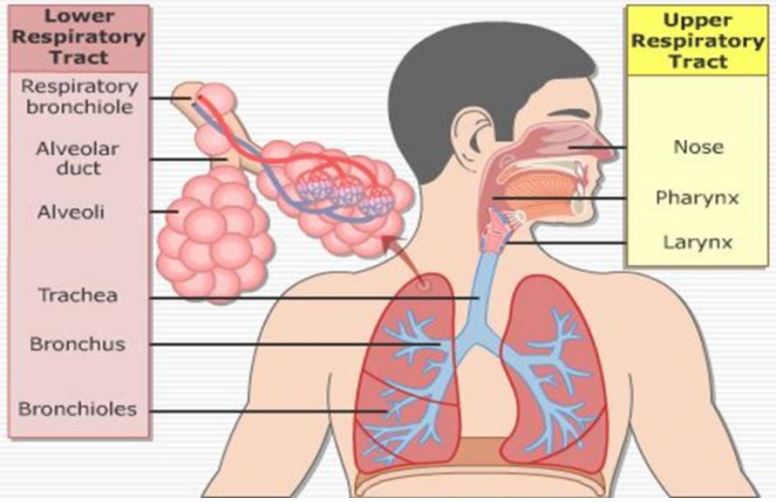
Respiratory system

function of respiratory system:-

1- absorption of O2 from the air
2- excretion of CO2 from the blood
3- regulation of blood PH
4- production of voice (larynx)

It is two parts

A) Conducting parts
B) Respiratory parts



Respiratory system

Conducting parts Are air passages , like nasal cavity , larynx trachea , bronchus and bronchioles .

1-Nose: made of cartilage and bone and is designed to warm, moisten, and filter air as it comes into the system

Nasal cavity contain:

1- Hairs :-act as a filter for dust from inspired air .

2- Mucous membrane :

1) Trapping the foreign bodies .

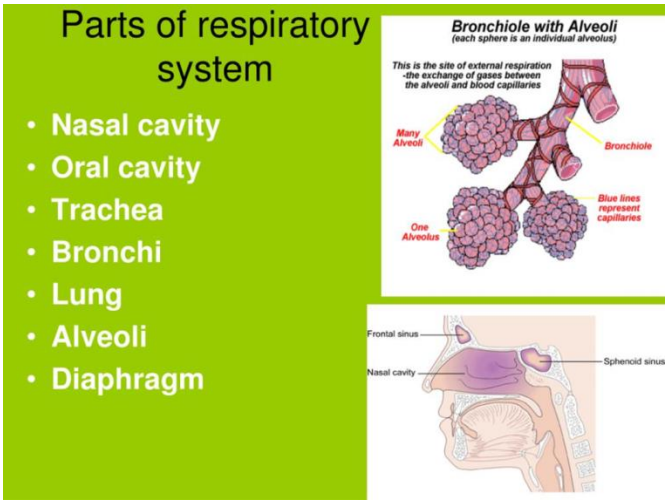
2) Moistened inspired air before reaching the lung .

3- Dense net of blood vessels :- to warming the inspired air .

2-Pharynx – (throat) conducts food and air; exchanges air with Eustachian tube to equalize pressure

3-Larynx – (voice box) connects the pharynx and the trachea; made of cartilage; contains vocal cords

4-Epiglottis – flap of tissue that covers trachea; ensures food travels down the esophagus.



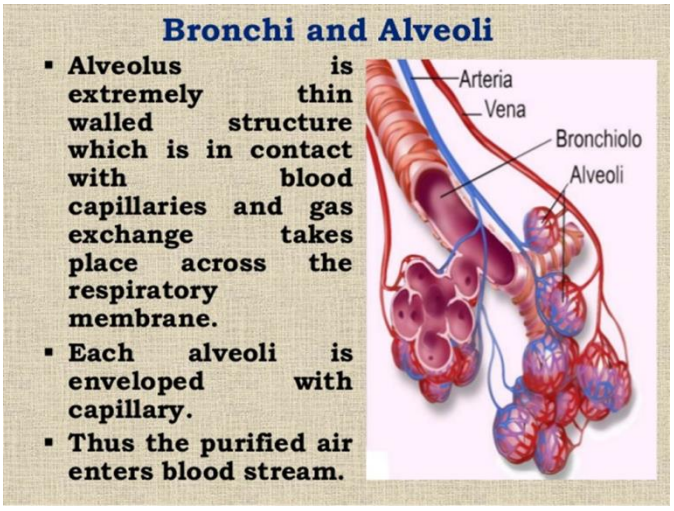
Respiratory system

Respiratory parts : are a sites for gas exchange between alveolar air and blood, like respiratory bronchioles and alveoli .

The Lungs: are a pair of conical shaped organs, with a millions of alveoli, for this, it is a spongy. Each lung was enveloped in a serous membrane called pleura. The pleura was of two layers

- visceral layer, covering the lungs directly
- parietal layer, lies anterior of the chest wall and the upper surface of the diaphragm. there is a serous fluid between these layers for lubrication.

Alveoli: cup shaped structures at the end of the bronchioles that resemble bunches of grapes; are in direct contact with capillaries (gas exchange); covered with SURFACTANT that keep them from collapsing



Respiratory system

Respiration is achieved by :

A: Inspiration (also called Inhalation**)** :Is the drawing of the air into the lungs and is brought about by contraction of the: **Respiratory muscles**

1) Inter costal muscles.
2) Diaphragm muscle.

B: Expiration (also called Exhalation)
Is the expulsion of the air from the lugs , is brought about by the relaxation of the : **Respiratory muscles**

1) Inter costal muscles
2) Diaphragm muscle
3) Accessory muscles (found in the cervical region) .

Respiratory system

Respiratory rate : It is the number of inspiration and expiration in one minute , its
normal at rest

= 15 – 20 / minute in adult
= 20 – 40 / minute in children
= more than 40 /min in infan

Types of ventilation :-

1- Pulmonary Ventilation (P.V.)
P.V. = Tidal volume x respiratory ate

= 400 x (15 or 20) = 6000 or 8000 cm2/min =6 or 8 L /min

2- Alveolar Ventilation (A.V.)

A.V. = (Tidal volume – Dead space) x respiratory rate

= (400 – 150) x (15 or 20)

= 250 x 15 or 20

= 3750 or 5000 cm3/min

Note :

The elastic recoil of the lungs and chest walls returns the chest to the resting respiratory level At the end of quiet expiration , the lungs still contain about 3 litres of alveolar air , but only 420 ml of this , is oxygen (14 % of 3 litres) , since the body requires 250 ml of oxygen every minute for metabolism

Respiratory capacities :

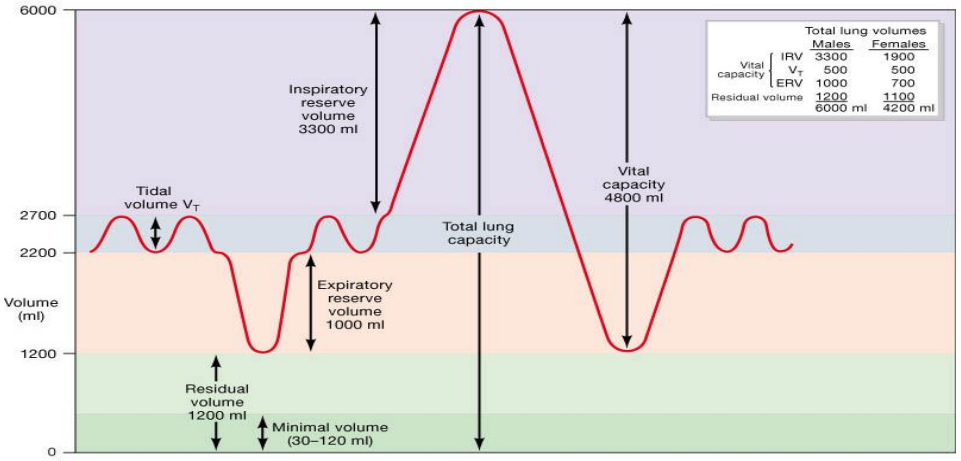
Vital Capacity : is the volume of air that inspired or expired in forced breathing, which is about 4800cc.

Residual Volume: is the residual volume represents the air that can not be removed from the lungs even by forceful expiration, it is about 1200cc.

Total Lung Capacity : is the total volume of the air that can be contained in the lungs after maximum inhalation which is 6000cc.

Tidal volume : Is the volume of air that inspired , and expired in normal breathing , which is about 400 cc.

Dead space air : It is the inspired air in the conducting parts of the respiratory system , which not share in the gases exchange , it is 150 cc.



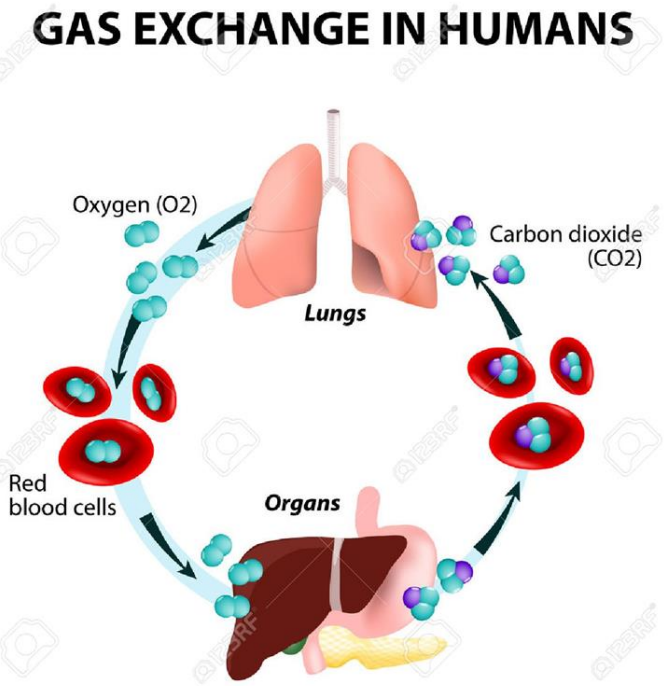
Respiratory system

percentage of air components:

air content	in alveolar air	room air
oxygen(O2)	14%	21%
carbondioxide(CO2)	5.5 - 6%	0.05%
nitrogen(N2)	80%	79%

Gas exchange : -

Occurs in a millions of alveoli (which provide a respiratory surface between 60 – 100 m2) where the O2 dissolves in a surfactant fluid inside the alveoli , then O2 diffuses across the two cells thickness separating the blood and alveolar air , and the dissolved O2 combined rapidly with the blood hemoglobin , and CO2 being released from blood plasma .



Factors affecting gases transport by blood :-

1) Partial blood pressure of the gas (or tension): the gas move from an area of high pressure to area of low pressure

A – In lung :

Gaz	Gaz P.In Alveolar	Gazp in Capillaries (Blood Come From Tissue)
PO_2	100 mmHg --------- O_2 transfer	⟶ 40 mmHg
PCO_2	40 mmHg	⟵ CO_2 transfer ---------- 46 mmHg

B – In tissue :

Gaz	Gaz P in Capillaries (blood come from lung)	Gaz p. in Tissue
PO_2	100 mmHg	⟶ 40 mmHg
PCO_2	40 mmHg	⟵ 46 mmHg

2) Content of the gas in blood:

the quantity of gases in blood depend on the amount of Hb.

Content	In artery	In vein
O_2	19 ml/100 ml blood	14 ml/100 ml blood
CO_2	48 ml/ 100 ml blood	52 ml/ 100 ml blood

Factors affecting respiratory rate:-

1- age: faster in children .
2- exercise: lead to increase the respiratory rate.
3- emotional disturbance: like hysteria which lead to increase the respiratory rate.
4- diseases:
a- pneumonia- lead to increase respiratory rate.
b- drugs poisoning – lead to decrease respiratory rate.
5- high center in brain affect during speaking and singing.
6- level of CO_2 in blood :
if increase CO_2 in blood ------increase respiratory rat.
If decrease CO_2 in blood -----decrease respiratory rate.
7- level of O_2 in blood:
if decrease O_2 in blood ----- increase respiratory rate.
8- change of blood pH:
if blood become Acidosis------- lead to increase respiratory rate.
If blood become alkalosis ------ lead to decrease respiratory rate.

الاسئلة البعدية

Q1 / Calculate the pulmonary ventilation in normal person.
Q2 / Enumerate the main functions of respiratory system.

رقم المحاضرة :	الثامنة والتاسعة
عنوان المحاضرة:	الجهاز العصبي
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
الفئة المستهدفة :	طلاب المستوى الاول
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الأهداف السلوكية او مخرجات التعلم:	1-التعرف على اقسام الجهاز العصبي 2-التعرف النواقل العصبية 3- التعرف على طبقات السحايا الدماغية
استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم الجهاز العصبي المحيطي ووظائفه , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

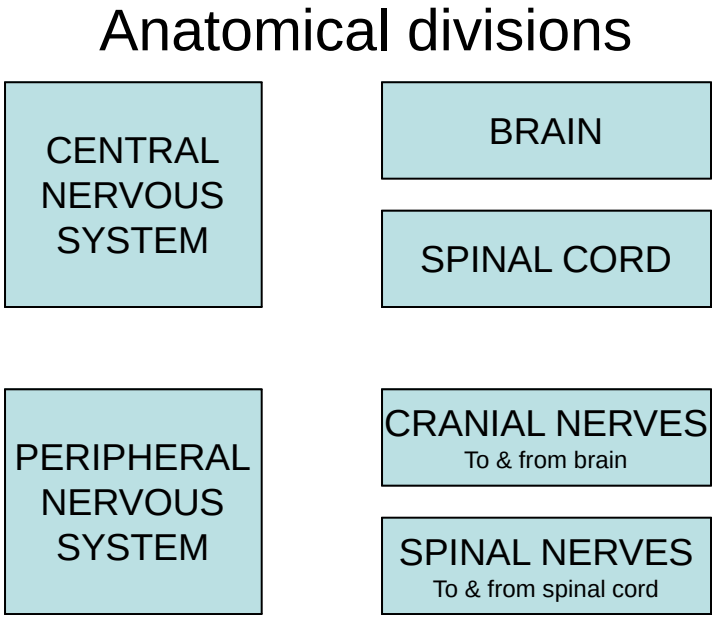
الاسئلة القبلية

Q1 / Enumerate the normal functions of nervous system.

Q2 / Define of the following : Acetylcholine , spinal cord .

Nervous System (NS):

The nervous system regulates most body systems using direct connections called nerves. It enables you to sense and respond to



The basic function are:

1 - Receive sensory input internal or external
2 - Integrate the input
3 - Responding to internal and external stimuli

Is divided into :-

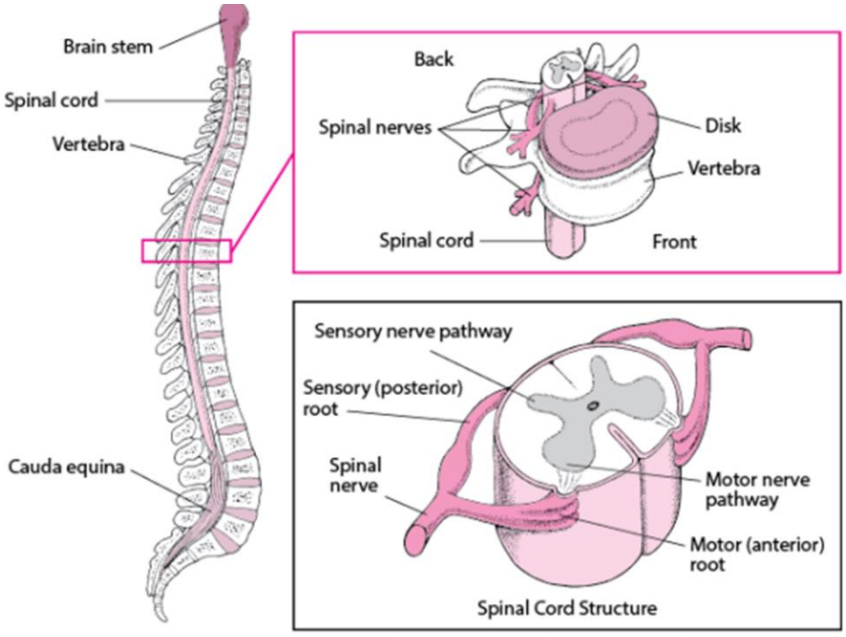
1) Central nervous system:

a- Brain **b-** spinal cord
The Brain does almost all processing 3 areas :
The Brainstem - controls many basic functions
The Lymbic System - control motivation and very important in memory
The Cerebral Cortex - complex processing of information .

The brain

spinal cord

Spinal Cord carries information and controls some reflexes



2) Peripheral nervous system : Is divided into the somatic and autonomic components.

The somatic controls voluntary movements (i.e. skeletal muscles)
The autonomic controls involuntary responses (i.e. stress, rest)

PNS :- include of nerves, which are:
A) cranial nerves ----------12 pairs
B) spinal nerves ----------31 pairs
1- crevical nerves --- ----8 pairs
2- thoracic nerves ------ 12 pairs
3- lumber nerves ------- 5 pairs
4- sacral nerves --------- 5 pairs
5- coccygeal nerves --- 1 pairs

3) Autonomic nervous system :-

composed neural ganglia and nerves fiber
consist of :-

A) Sympathetic nervous system :-
is a nerves originates from thoracic – lumber region of spinal cord, which contain ganglia .The chemo-transmitter used here is " Nor adrenaline ".

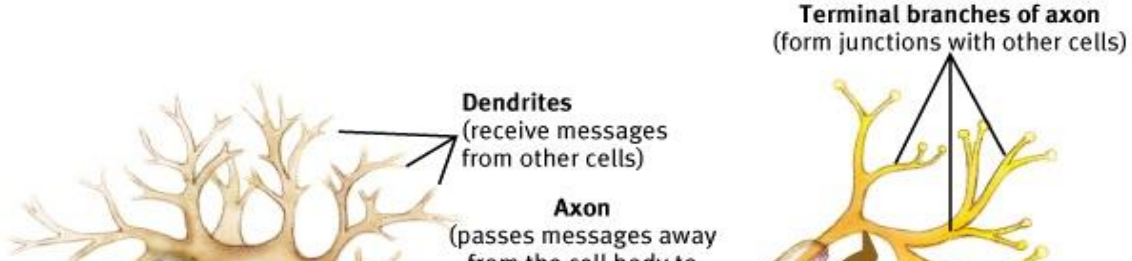
Function :- (Adrenergic) = (Acetylcholine)
1- Dilate – pupil, respiratory passage
2- Increase – heart rate, cardiac output, sweating
3-Decrease – secretion of saliva - gastric and pancreatic juice, blood pressure , intestinal movement
4-Erection hairs of body and head
5- "Fight or Flight

B) Parasympathetic nervous system :-
is consist of some cranial nerves and some spinal sacral nerves, the chemical transmitter used is Acetylcholine.

Function :- (Cholinergic) = (Norepinephrine)
1- Constricts – pupil, respiratory passage
2- Decrease – heart rate, cardiac output, blood pressure
3- Increase – intestinal movement, gastric and pancreatic juice secretion, salivary secretion
4-Stimulate the lacrimal glands
5-play important role in urination and defecation
6- "Rest and Digest"

The neuron:- It is a cell (nerve cell), like other cells contain nuclear and cytoplasm and other organelles, but with special name like sarcoplasm and sarcolema.

Three types of neurons (FUNCTIONAL TYPE):-
1-Sensory neurons : Long dendrite, short axon and carry messages from sensory receptors to the central nervous system
2-Motor neuron : Long axon, short dendrite and transmit messages from the central nervous system to the muscles (or to glands)
3-Interneuron : found only in the central nervous system where they connect neuron to neuron



Characters of neuron :-

1- Irvitability – receive sensory stimulus from internal or external environment

2- Conductivity Pre & Postganglionic Neurons

Preganglionic fibers pass between CNS and ganglia

Postganglionic fibers pass between ganglia and effecter organ

Type of chemical transmitters :-

1- Acetylchdine :- secreted at the end of parasympathetic nerve fibers

2- Noradrenaline :- secreted at the end of sympathetic nerve fibers

3- Serotonin :-function only inside the central system

الاسئلة البعدية

Q1 / Drew and libel the diagramed figure of neuron .

رقم المحاضرة :	العاشر والحادي عشر
عنوان المحاضرة:	الجهاز الهضمي
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
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استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم على وصف الجهاز الهضمي ووظائفه الرئيسية , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

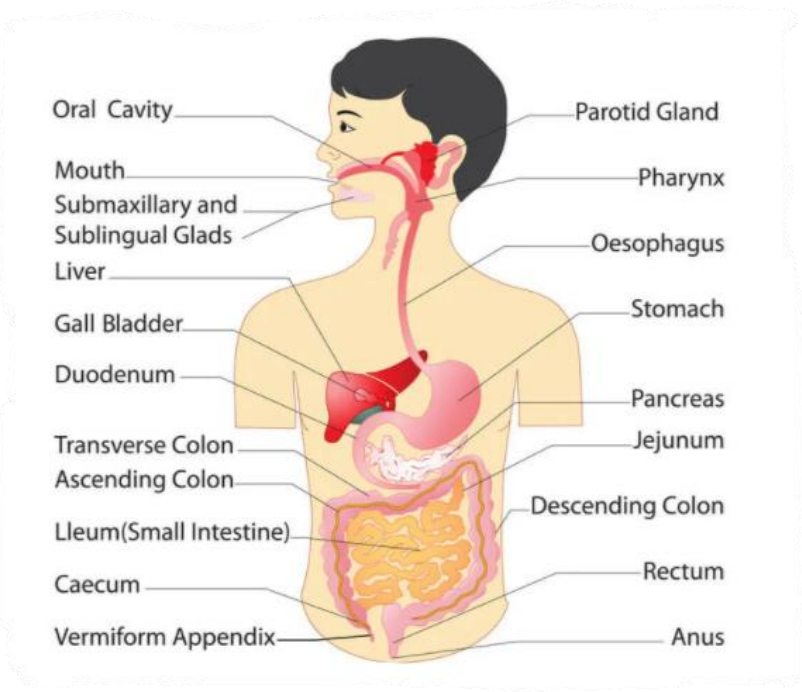
الاسئلة القبلية

Q1 / Enumerate the main functions of digestive system.
Q2 / Mention the types of salivary gland.

Digestive system

Consist of :-

1- Mouth
2- Pharynx
3- Esophagus
4- Stomach
5- Small intestine
6- Large intestine
7- Anal canal and anus
8- Accessory glands (liver, pancreas, salivary glands)



Function of Dig. System :-

1-Ingestion:- mastication and swallowing.
2-Digestion:- perform by enzyme, which convert the complicated food stuffs into simple forms which can be absorbed.
3-Absorption:- mainly take place in small intestine.
4-Egestion:- excretion of food residue (as faces) to outside

Digestive system

Mouth:- consist of :
(lips, teeth, tongue, salivary glands)
Function of mouth:-
a- Mastication:- break down of the food by the help of teeth.
b- Swallowing:- push the food by the help of tongue.
c- Help in speech:- by the help of tongue and lips.
d- Protect the teeth.
e- Moistening of the food:- by the help of the salivary gland.

Digestive system

Teeth:-
Temporary 20,
Permanent 32(incisors 8, canines 4, premolars 8, molars 12).

Salivary glands

Are pairs:-

1- parotid glands
2- submandibular glands
3- sublingnal glands

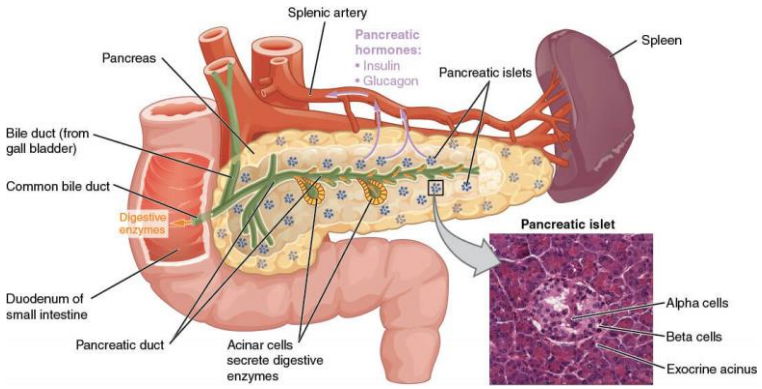
Secrete saliva:- which colorless, alkaline fluid, consist of water 90%, mucin, Ca salts, amylase(enzyme).

Function of saliva:-

1- digestion of carbohydrate by amylase (starch -----salivary ----- amylase maltose)
2- moistening of the food by mucin.
3- deposition of Ca salts on the teeth.
4- solvent of some foods and drugs

Pancreas:-

Big gland, lies in the left posterior abdominal wall, connect with duodenum by pancreatic duct:



Function:- Secret two different secretion :-

Internal secretion :- are two hormones, secrete directly into blood so that the pancreas consider as endocrine gland

1-Insulin:- enable the tissue to use sugar (glucose).

normal level of glucose 80 – 120 mg/100ml blood. Deficiency of insulin cause diabetes mellitus.

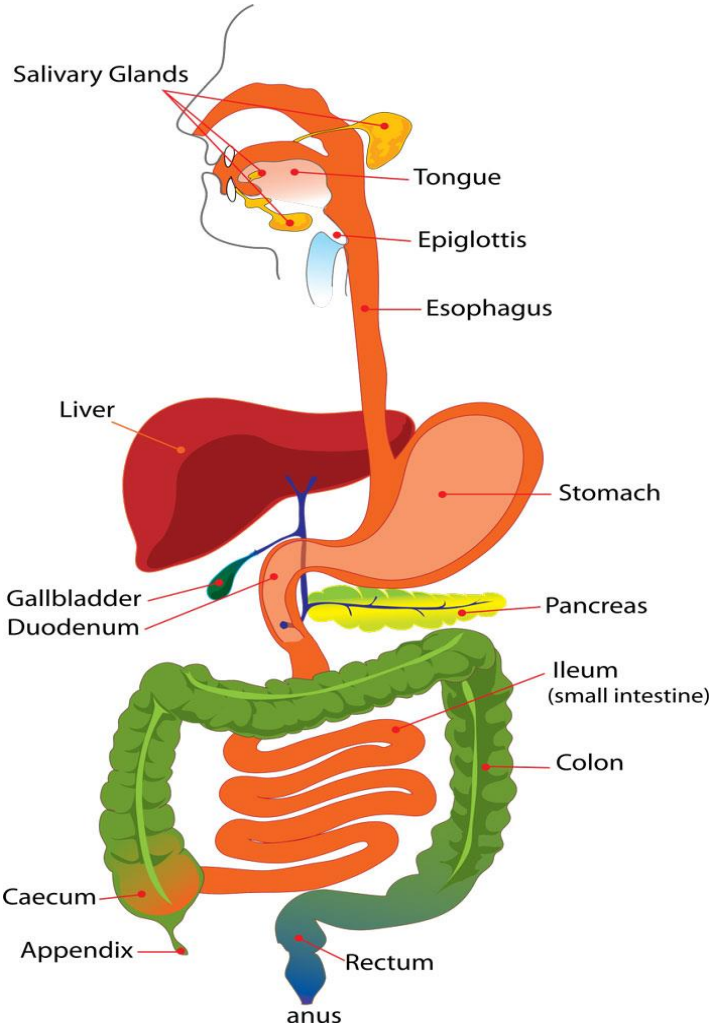
2-Glucagon:- has opposite action of insulin, so it increase glucose level in blood by convert liver glycogen into glucose.

External secretion (pancreatic juice) :- amount 3/4 liter/day.

Pancreatic juice :

1-NaHCO3

2-Enzymes: **1-pancreatic amylase** – convert starch into maltose.
2-pancreatic lipase – convert fat into fatty acid +glycerin.
3-trypsin – convert proteins into amino acid.



Pharynx:- it is a common passage of digestive and respiratory systems. It is expanded tube of 13cm long.

esophagus:-

a- It is a muscular tube of 25cm long.

b- It push the bolus toward the stomach by peristalsis movement.

Stomach:-

a) Includes 4 region :-

1-cardia **2-**fundus **3-**body **4-**pyloric

b) Secrete gastric juice:-

which is acidic, colorless fluid, about two liter per a day consist of:-

1- water 90% **3-** HCL

2- mucin **4-** enzyme (pepsin)

Function of the stomach:-

1- act as reservoir of food.

2 -break down the food stuff into chyme.

3- secretion of intrinsic factor:-aid in absorption of Vit.B12.

4- slight absorption of:-water, glucose, alcohol and some drugs.

5 -secretes gastric juice, which the main component are:-

A-HCL:- it's function

a- neutralize the alkaline saliva.

b- acts as antimicrobial agent.

c- aids the action of pepsin in protein digestion.

B-Pepsin:- Digest protein

Protein ---pepsin → peptones.

C-Mucin:- protect the mucous membrane of the stomach from action of pepsin and HCL (prevent gastric ulcer).

Factors affecting secretion of gastric juice:-

1- Neural factor:- stimulate the vagus nerve, lead to increase gastric juice.

2- Hormonal factor:- secretion of gastrin hormone lead to increase gastric juice

Small intestine:-

It is a tube of about 6 meters in length, which consist of :-

a- Duodenum (12 inch long), open in it a bile duct and pancreatic duct.

b- Jejunum.

c- Ileum.

Function of S. Intes. :-

a) Secretion of intestinal juice (about 3 liters/day), composed of :-
1- water
2- mucin:- protect the mucous membrane from the action of chyme and prevent the duodenal ulcer.
3- enzyme:- like erepsin , which digest protein.
b) Digestion of food stuffs by enzyme
1- polypeptide (protein) ---- erepsin ⟶ amino acids.
2- complete the digestion of carbohydrates :-
Maltose ---- maltase ⟶ glucose.
Lactose ---- lactase ⟶ glucose + galactose.
Sucrose ---- subareas ⟶ glucose + fructose.
c) Absorption

absorbed of the simples digested food using villi :-
a- into the blood (like glucose and amino acids).
b- into the lymph (like fatty acids and glycerin)
d- Pushing the remaining food to large intestine by peristalsis movement

Large intestine:-

Is 1.5 meter long. consist of :-
1- caecum and appendix.
2- ascending colon.
3- transverse colon.
4- descending colon.
5- sigmoid colon.
6- rectum.
7- anal canal and anus

Function :-

1) slight absorption of :-
a- water **b-** some salts **c-** drugs
2) secretes mucin:-for lubrication of the faces for smooth passage.
3) egestion (excretion) of waste product to outside by defecation.
4) excretion of calcium, iron and drugs residue.
5) bacteria live in large intestine help in :-
a- providing the body with Vit. B. and Vit. K.
b- decomposition of cellulose.

الاسئلة البعدية

Q1 / Define of the following : pancreas , liver , saliva ,small intestine

رقم المحاضرة :	الثاني عشر والثالث عشر
عنوان المحاضرة:	الجهاز البولي والجهاز التناسلي
اسـم المدرس:	ا.م.د. ليلى عبد الستار صادق
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استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم رسم تخطيطي للنفرون, مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

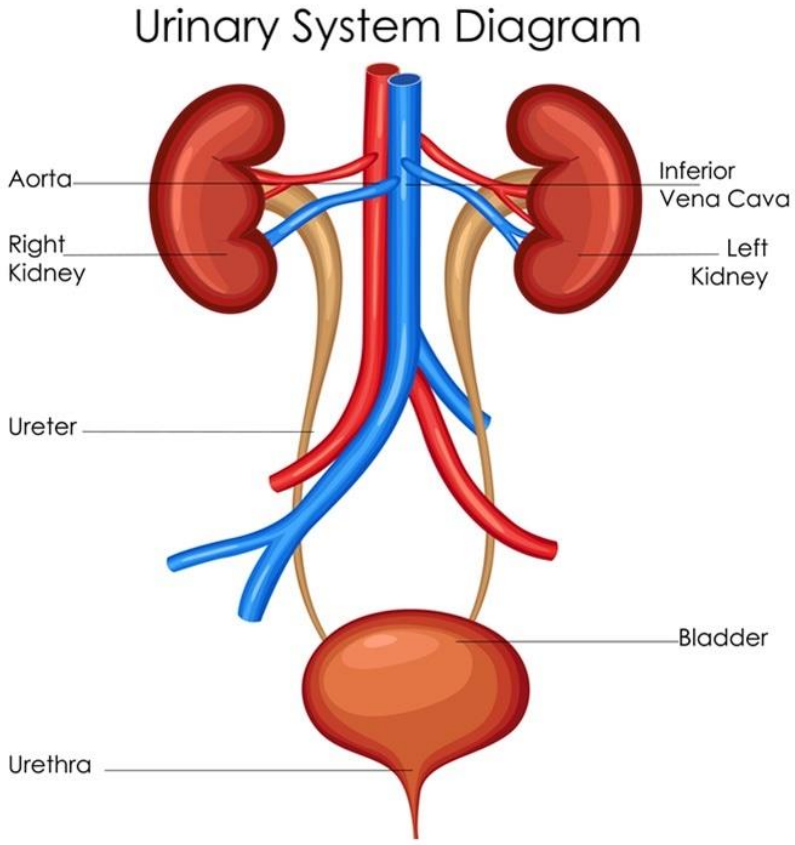
الاسئلة القبلية

Q1 / Enumerates the main functions of kidneys.
Q2 / Enumerates the normal components of urine.

Urinary system

Structure

Also called excretory system , because is to remove the waste product from the blood and eliminate them form the body . Is consist of :-
Two Kidneys .
Two ureters .
Urinary bladder .
Urethra (male 20cm , female 4cm long)



Kidneys structures :-

1) a pair of organs .

2) situated on the posterior abdominal wall , lie between the 12th thoracic and 3rd lumber vertebra .

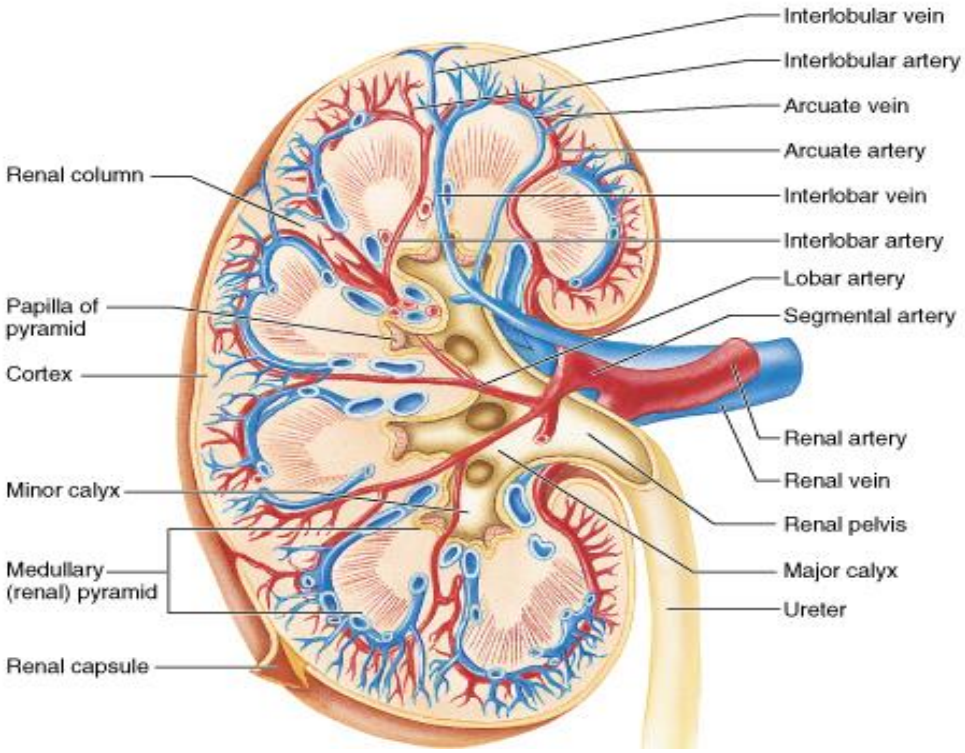
3) are been shaped , reddish brown in color .

4) it is size of 11.25cm long , 5-7.5cm width , 3cm thickness .

5) each contain a million of nephrons .

6) each have internal structures , as :-

a- Cortex .
b- Medulla .
c- Minor calyxes .
d- Major calyxes .
f- Renal pelvis .



Normal Function of Kidney :-

1) Keep the body in homeostasis :- by controlling composition and volume of the fluid by removing and restring the selected amount of water and solutes .
2) Help to control blood pH (by acid – base balancing) .

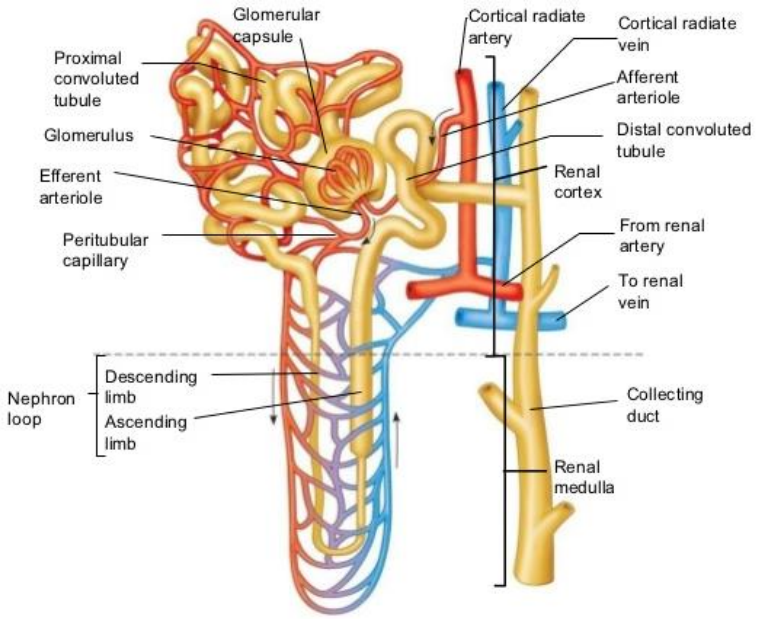
3) Help to control electrolyte composition of body fluid .
4) Help to control blood pressure , by production renin (hormone) that activates the renin – angiotension path way

Nephron :-

Is a coiled tube with a bulb of one end . This bulb called Bowman's capsule, which surrounds a cluster of capillaries called glomerulus . A small blood vessel called the afferent arteriole supplies the glomerulus with blood ; another small vessel called the efferent arteriole carries blood from the glomerulus .

Nephron consist of :-

1) Bowman's capsule
2) Glomerulus
3) Proximal convoluted tubule
4) Loop of Henel's
5) Distal convoluted tubule
6) Collecting tubule



Composition of urine

The urine:-

Is yellowish liquid, about 95% water and 5% dissolved solids and gases. The amount of these dissolved substances is indicated by "specific gravity".

Urine contain:-

1- surplus water
2- surplus electrolytes
3- surplus acid and alkalis
4- metabelic waste product including :-

A-urea:- is a nitrogen portion of amino acids convert to ammonia then to urea.
B- uric acid:- is a nitrogen of nucleic acid and purines a pear as a form of uric acid.
C- creatinine:- a rise from muscles creatine ,when a pear in urine this resemble that the body lost the nitrogen.
5- metabolic content of some drugs.
6- chorionic gonadotrophin:- is a hormone a pear in case of a pregnant female, which is use in examination of pregnancy.
7- yellow pigment:- including bile compounds.

abnormal constituents:- if present in urine indicate there is a disturbance, including :-

a- glucose:- the reason is the diabetes mellitus.
b- keton bodies :- the reason is the ketosis.
c- plasma albumin:- the reason is kidney disease.
d- red cells:- the reason is kidney disease.
e- galactose:- the reason is galactosaemia.

Urine formation :- Urine is formed by three processes :-

1- Glomerular Filtration :- The wall of glomerular capillaries acts as a sieve which permit the free flow of water and soluble material through them , and are impermeable to blood cells and large protein molecules . But the filtration is entirely non –selective what ever the body's requirements

Large molecules (not filtered)	**Small molecule (filtered)**
Blood cells , Plasma protein	**Water , inorganic salt , glucose , amino acid ,**

Waste products
(urea , uric acid creatinine)

2- Tubular Secretion :- Another substances are added to the glomerular filtrate by active transport from blood vessels that surround the tubules , like surplus acid and alkalis , also penicillin lost from the body by this mechanism .

3- Tubular Reabsorption :- Capillary network surrounding the renal tubules allows re-absorption of a substances according to the body's needs from the filtrate like glucose . The re-absorption is selective.

Water Filtration :-

1- all nephrons filter 120ml of water per minute (this is called glomerular filtration rate– GFR)
2- of the120ml , about 119ml of water are reabsorbed , and only 1ml . passes to the collecting tubes .
3- 1ml / min . reach to1500ml / day secrete to outside .
4- glomerular filtration of water about 170 liter / day , and the total body water 45 liter , this mean that body water are filtered about 4 time / day.

Water Re-absorption :- Of filter water :

1- as said , about 119ml water / minute reabsorbed , this equal about 168.5 liter / day .
2- 7/ 8 of NaCl is reabsorbed by active transport in the proximal tubules . so 7/ 8 of water is reabsorbed passively with sodium(Na) .
3- 1/8 of water reabsorbed in distal tubules by the affect of the anti diuretic hormone (ADH).

Urination:- *(Macturation)*

Is the process of expelling urine from the bladder, and take place as follows:-
1- as bladder fills, a stretch receptors send impulses to a center in the lower part of spinal cord .
2- from spinal cord, a motor impulses are send out to the bladder musculature and the bladder is emptied.
3- at the time of urination can be voluntary controlled unless the bladder becomes too full.

Q1 / Enumerates the abnormal components of urine.
Q2 / Drew and liable the diagrammatic figure of nephron.
Q3 / Mention the formation of urine process.

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الفئة المستهدفة :	طلاب المستوى الاول
الهدف العام من المحاضرة :	
الأهداف السلوكية او مخرجات التعلم:	1-التعرف على تعريف الغدة والهرمون 2-التعرف على انواع الغدد والهرمونات 3- معرفة مصادر الافراز
استراتيجيات التيسير المستخدمة	عرض تقديمي، شرح، الصبورة
المهارات المكتسبة	مهارات التعلم على انواع الهرمونات التي يفرزها الجسم , مهارات العرض والتقديم
طرق القياس المعتمدة	الاختبارات التحريرية ،الاسئلة والمناقشة ، تحليل الردود

الاسئلة القبلية

Q1 / Mention the Chemical Classification of Hormones.
Q2 / Enumerate the Anterior lobe hormones of pituitary gland .

Endocrine Glands

A glands which secrete their products into the blood
are ductless glands
The products secreted by these glands are called Hormones
travel by blood to a target cells far away from gland

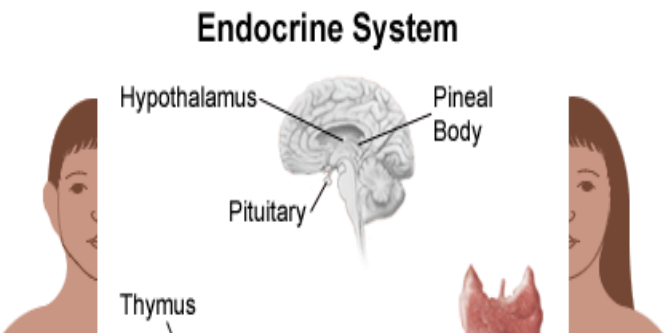
Chemical Classification of Hormones

Steroid Hormones: -
Secretes by endocrine glands: –
Adrenal cortex•
Ovaries •
Testes •
placenta –

Non steroid Hormones:
Secretes by endocrine glands
Thyroid gland
Parathyroid gland
Adrenal medulla
Pituitary gland
pancreas

Endocrine Glands

- Hypothalamus
- pineal body



- Pituitary
- Thyroid
- Parathyroid
- Pancreas
- Adrenal
- Gonads (testis ,ovary)

Hypothalamus

Location- Base of brain case

Functions- Regulation of Primitive or Basal activities such as sex drive and water balance

Pineal body

• The pineal body is located below the corpus

• callosum, a part of the brain. It produces the

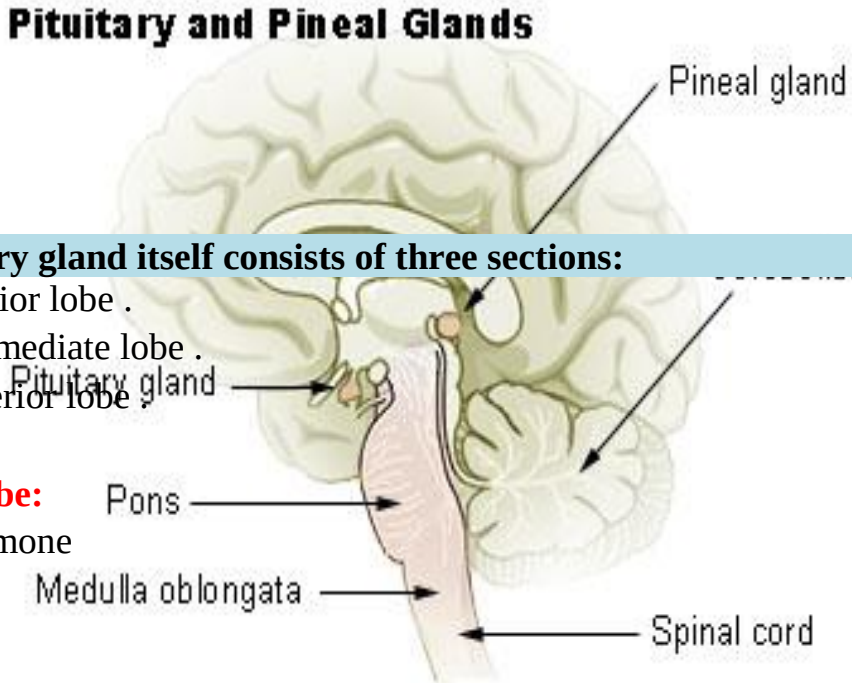
• hormone melatonin and secrete it directly

• into the cerebrospinal fluid, which takes it

• into the blood.

•Melatonin affects reproductive development and daily physiologic cycles.

Pituitary• The pituitary gland or hypophysis is located at the base of the brain. No larger than a pea.



The pituitary gland itself consists of three sections:

1- The anterior lobe .

2- The intermediate lobe .

3- The posterior lobe .

Anterior lobe:

Growth hormone

- Prolactin - to stimulate milk production after giving birth
- ACTH (adrenocorticotropic hormone) - to stimulate the adrenal glands
- TSH (thyroid-stimulating hormone) - to stimulate the thyroid gland
- LH (luteinizing FSH (follicle-stimulating hormone) - to stimulate the ovaries and testes hormone) - to stimulate the ovaries or testes

Intermediate lobe:

Melanocyte-stimulating hormone - to control skin pigmentation

Posterior lobe:

ADH (antidiuretic hormone) - to increase absorption of water into the blood by the kidneys

Oxytocin - to contract the uterus during childbirth and stimulate milk production

الاسئلة البعدية

Q2 / Enumerate the Anterior posterior lobe hormones of pituitary gland .

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الاسئلة القبلية

Q2 / Define of the followings : muscle , muscle fiber , Myofibril .

muscular system

MUSCLE

It is a Cell (fiber) responsible for contraction and relaxation , approximately 40 per cent of the body is skeletal muscles and 10 per cent is smooth and cardiac muscles.

There are three types of muscles :

1- skeletal muscles : joined with the bones (responsible for body movement), also found in the upper portion of the esophagus ,tongue, long cylindrical cell (fiber), voluntary control.

2- smooth muscles : found in internal body organs except heart, involuntary control ,spindleshape cells

3- cardiac muscles : found in the heart ,involuntary control , short bifurcate cylindrical cell

Muscle fiber :

In most muscles , the fibers extend the entire length of the muscle (except 2 per cent) each is innervated by only one nerve end located near the middle of the fiber .

Each muscle fiber composed of :

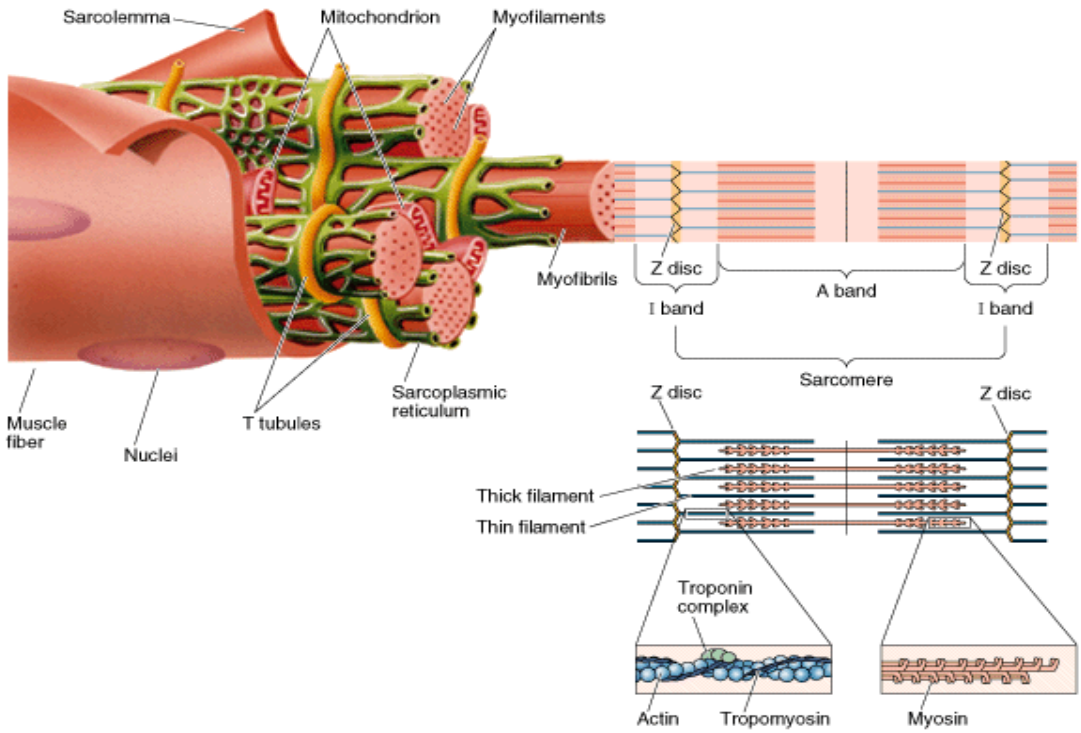
a- sarcolemma : cell membrane

b- sarcoplasm : cell cytoplasm

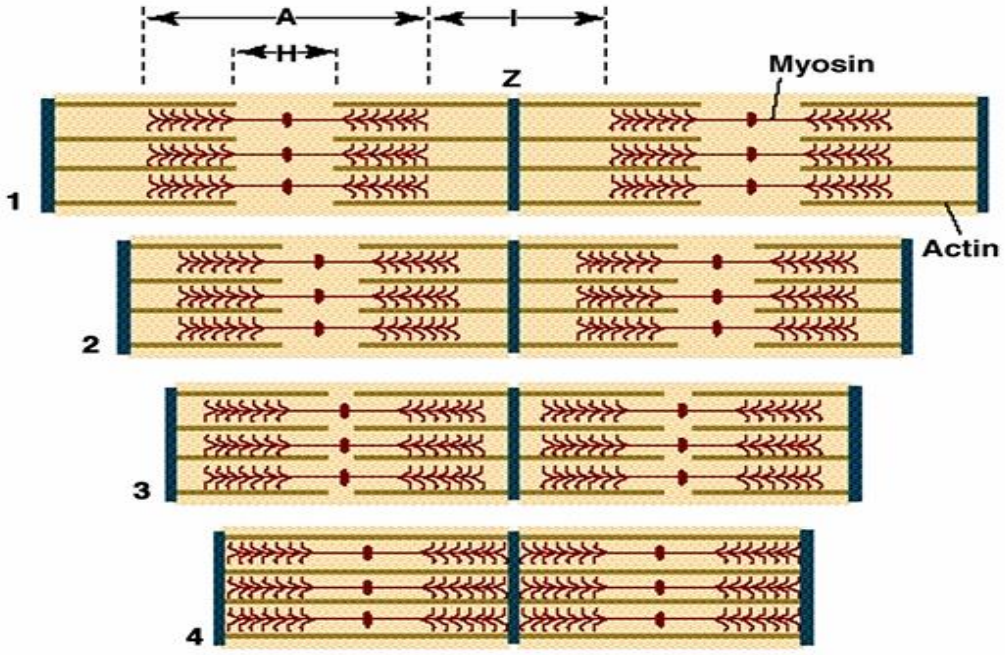
c- several thousand myofibrils , mitochondria , endoplasmic reticulum , nucleus and other cell inclusions **.**

Myofibril : Each muscle fiber (cell) contains several hundred to several thousand myofibrils , Each myofibril in turn has lying side - by - side about 1500 myosin filaments and 3000 actin filaments , which are large polymerized protein molecules responsible for muscle contraction . The myofibrils are bathed in sarcoplasm in side the muscle fiber, where the sarcoplasm contains large quantities of potassium , magnesium , phosphate ,protein enzymes , mitochondria (for ATP need for contraction) and sarcoplasmic reticulum (important in control of muscle contraction).

► **Organization of a Muscle Fiber**



Muscle contraction : occur by a sliding filament mechanism , by pulling the actin filament in word among the myosin filament , so that they now over lap each other , where this caused by generated by the interaction of the mechanical , chemical , or electrostatic forces cross- bridge of the myosin filaments with the actin filaments . The figure below illustrates the contraction of muscle fiber and shows the over lapping of actin and myosin filaments



Under resting condition , the sliding forces between the actin and myosin filaments are inhibited , but when an action potential travels over the muscle fiber membrane , this causes the release of The into the sarcoplasm surrounding the myofibril . calcium ions the large quantities of is energy . But calcium ions activate the forces between the filaments and contraction beginswhich is ATP . This energy is derived from for the contractile process to proceedalso needed degraded to ADP to give the energy required.

الاسئلة البعدية

Q2 / Enumerates the deferential point between smooth and cardiac muscle

المصادر الاساسية :

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- **المصادر المقترحة:**
- 2- Ganong's review of medical physiology 25th edition
- **روابط مقترحة ذات صلة:**