

Daily Average Secretion of Intestinal Juice		pH
Saliva	- 1200 ml	6.8
Bile Juice	- 800 ml	7.7
Gastric Secretion	- 2000 ml	1.5 – 3.5
Pancreatic Secretion	- 1500 ml	7.5 – 8.3

- Total Gastro and Intestinal Secretion in 24 hours = 8000 ml. (pH – 7.5-8.0)
- Total Water loss by skin & Respiratory tract in 24 hour = 600 – 800 ml
- Saliva contain highest concentration of – K +
- Potassium content in colonic secretion is – 100 m Eq/L

Sites of Absorption of different end product in GI Tract	
Stomach	Water, Alcohol, Aspirin
Duodenum	Iron (Fe ⁺⁺), Calcium (Ca ⁺⁺), Copper (Cu)
Jejunum	Glucose (monosaccharide), Protein (Amino acids), Fat (Cholesterol) & Vitamins = B ₂ , B ₆ , C
Ileum	Bile salt, B ₁₂ absorption (Schilling test)
Ascending Colon	Water (Maximum absorption)

plasma glucose is > 125mg/dl = Diabetes mellitus.	Specific Gravity
Blood sugar – fasting – 70 – 110 mg/dl PP – 110 – 160 mg/dl	S.G. C.S.F. – 1005 S.G. Urine – 1010
Plasma glucose – fasting – 75 – 115mg/dl PP = <125mg/dl	S.G. Blood – 1025 S.G. Milk – 1017 – 1034

T S H		Bilirubin	
T S H	– 0.4 – 4.7 ug/dl	Total	– 0.3 to 1.0 mg/dl
Total T ₃	– 60 – 180 ng/dl	Direct	– 0.1 – 0.3 mg/dl
Total T ₄	– 4.5 – 11 ug/dl	Indirect	– 0.2 – 0.7 mg/dl

Conditional Calorie requirement	Calorie requirements according to age
1. Simple worker – 3000 /day	1. 1 – 6 years – 1000 – 1600 daily
2. Student – 2400 /day	2. 7 – 12 years – 1600 – 2500 daily
3. Hard worker – 4500 /day	3. 13 – 20 years – 2500 – 2800 daily

– Daily Energy requirement of a 70kg person –

- Lying on bed whole day (without taking any food) = 1650 calories.
- Lying on bed whole day (with taking a reasonable diet) = 1850 calories.
- Sit on a chair whole day (energy requirement) = 2250 calories.

NORMAL PATHOLOGICAL VALUE

1. Serum Amylase	60 – 180 unit/Litre
2. Serum Chloride	100 – 110 mg/100ml
3. Serum Triglycerides	80 – 150 mg/100ml
4. Serum Cholesterol	150 – 250 mg/100ml
5. Serum Alkaline Phosphate	30 – 120 unit/Litre
6. Serum Na +	130 – 145 mg/100ml
7. Serum Fe ++	30 – 150 mg /100ml
8. Serum Ca ++	8.5 – 10.5 mEq/ 100ml
9. Serum K+	3 – 5 mEq/litre
10. Serum Mg ++	2 – 3 mg/100ml
11. Serum Creatinine & Ketone Bodies	0.6 - 1.5 mg/100ml
12. Serum Creatine	0.2 - 0.6 mg/100ml
13. Ammonium	40 - 80 mg/100ml
14. Uric acid	Male – 2.5 – 8 mg /100ml Female – 1.5 – 6 mg/100ml
15. Blood Urea	15 – 40 mg %
16. Total Lipid	350 – 800 mg/100ml
17. Total Protein -- Albumin	5.5 – 8 gm/100ml Male – 3.5 – 5.5 gm/100ml Female – 2.0 – 3.5 gm/100ml
18. Serum Phospholipid	4 – 10 mg/100ml

SGPT/ Serum Glutamic Pyruvate Transaminase or ALT/ Alanine transaminase -- 10 to 60 IU/L

SGPT or Alanine aminotransferase (ALAT) is an enzyme present in hepatocytes (liver cells). When a cell is damaged, it leaks this enzyme into the blood, where it is measured. ALT rises dramatically in acute liver damage, such as viral hepatitis or paracetamol (acetaminophen) overdose.

SGOT/ Serum Glutamic Oxaloacetic Transaminase or AST Aspartate transaminase – 10 to 40 IU/L

SGOT or aspartate aminotransferase (ASAT) is similar to ALT in that it is another enzyme associated with liver parenchymal cells. It is raised in acute liver damage, but is also present in red blood cells, and cardiac and skeletal muscle and is therefore not specific to the liver.

Mean corpuscular volume (MCV) -- is a measure of the average size of your red blood cells.

Abnormal MCV levels may be a sign of anemia or thalassemia. **MCV – 80 - 100 femtoliter**

Mean corpuscular hemoglobin or "mean cell hemoglobin" (MCH), is a measure of the amount (weight) of hemoglobin in a red blood cell. **MCH – 20-30 picograms/cell**

Blood urea nitrogen (BUN) test is a measure of the amount of nitrogen in the blood in the form of urea, and a measurement of renal function. **BUN – 10-20 milligrams per deciliter (mg/dl)**

Hematocrit or Packed cell volume (PCV) a measure of the proportion of blood volume that is occupied by red blood cells. **PCV –** It is normally about 45% for men and 35% for women.

BMR (Basic Metabolism Rate) :: --

1. Male – 38.2 k cal/sq meter/hr

2. Female – 32.1 K cal/sq meter/hr

Nutrition	Daily dose	Vitamin	Dose
1. Carbohydrate	400 – 500 gm	Vit A	5000 I.U. (1500 µg)
2. protein	75 -100 gm	D	400 I.U. (10 µg)
3. fat	75 -100 gm	E	10–15 I.U. (22 mg)
4. water	2 -4 pints	K	3000 I.U. (80 µg)
	I – 150 µm	Vit B1	1.5 mg
	Mg – 0.4 gm	B2	1.8 mg
	K – 1 gm	B3	10 mg
	Ca,P – 1.5 gm	B5	18 mg
	Na – 4 gm	B6	2.0 mg
	Cl – 3.5 gm	B7	0.4 mg
	NaCl – 10 – 15 mg	B12	6 µg
	Zn – 15 mg		
	Fe – 18 mg	Vit C	40 – 80 mg
	Cu – 105 mg	Folate	- 400 µg

- :: Seminal fluid :: -

Speed of Human sperm in female genital tract is = 3 mm / minute.

Liquefaction/ Fibrinolysis – within 20 min.

Sperm Motility – > 60% pH – 7.7 – 8], Count – 60–150 million/ml, Volume – 2 – 5 ml

20 % of the volume of the semen is contributed by the secretion of the prostate gland.

In man the spermatozoa occupies about 10 % of the semen.

- :: Cerebrospinal fluid (C.S.F.) :: -

Defination – Modified Serous fluid

Location – 1. Ventricles of the brain
2. Central canal of the spinal cord
3. Sub arachnoid space

Formation – Anterior & posterior **Choroid Plexus** of Lateral ventricle 3th & 4th.

Absorption – CSF is Absorbed through the **Arachnoid villi**.

CSF is produced in the brain by modified [ependymal cells](#) in the [choroid plexus](#) (approx. 50-70%) and the remainder is formed around blood vessels and along ventricular walls. It circulates from the [lateral ventricles](#) to the [foramen of Monro](#) (Interventricular foramen), [third ventricle](#), [aqueduct of Sylvius](#) (Cerebral aqueduct), [fourth ventricle](#), [foramen of Magendie](#) (Median aperture) and [foramina of Luschka](#) (Lateral apertures), [subarachnoid space](#) over brain and spinal cord. **Gross appearance** – Normal CSF is clear and colorless.

Normal Value – **150 ml.**

Daily production – 5000 ml

CSF Pressure = **50 – 150 mm of water.**

S.G. of CSF = 1004 – 1005

pH – **7.34**

Glucose in CSF – 40 – 85 mg/dl

Protein in CSF – 15 – 45 mg/dl

Albumin in CSF – 6.6 – 44 mg/dl

Chloride in CSF – 720 – 750 mg/dl

RBC cell in in CSF – Absent.

Leukocytes (WBC) – 0 – 5/µL (adults / children);
up to 30/µL (newborns).

CSF opening pressure – 50–180 mmH₂O.

Lactate dehydrogenase – 1/10 of serum level.

Lactate – less than 35 mg/dL.

Differential – 60–70% lymphocytes, up to 30% monocytes & macrophages, other cells 2% or less

For CSF Examination – Lumbar puncture is done in between L₃ and L₄ vertebra.

CSF Examination

Bacterial Meningitis

Glucose (mg/dL):	Normal to marked decrease. <40 mg/dL.
Protein (mg/dL)	(Marked increase) > 250 mg/dL.
WBCs (cells/ μ L)	>500 (usually > 1000). Early: May be < 100.
Cell differential:	Predominance of Neutrophils (PMNs)
Culture:	Positive
Opening Pressure	Elevated

Fungal Meningitis

Glucose (mg/dL):	<40 mg/dL (Low)
Protein (mg/dL)	(moderate to marked increase) 25 -500 mg/dL
WBCs (cells/ μ L)	Variable (10 -1000 cells/ μ L) <500cells/ μ L.
Cell differential:	Predominance of Lymphocytes
Culture:	Positive (fungal)
Opening Pressure	Variable

Tuberculosis Meningitis

Glucose (mg/dL):	<40 mg/dL (Low)
Protein (mg/dL)	(moderate to marked increase) 50 -500 mg/dL
WBCs (cells/ μ L)	Variable (10 -1000 cells/ μ L) <500cells/ μ L.
Cell differential:	Predominance of Lymphocytes
Culture:	Positive for AFB
Opening Pressure	Variable

Viral Meningitis

Glucose (mg/dL):	Normal (> 40 mg/dL.)
Protein (mg/dL)	<100 mg/dL (moderate increase)
WBCs (cells/ μ L)	< 100 cells/ μ L.
Cell differential:	Early: neutrophils. Late: lymphocytes.
Culture:	Negative
Opening Pressure	Usually normal

---: Blood :---

Blood – Fluid connective Tissue.

Total Blood volume – 5.0 to 6.0 litre

90 ml/Kg body wt. = 9 % of Total body wt. = 1/11 of body wt.

pH of Blood – 7.35(Vein) --7.45(Artery)

Viscosity – 4.7

Osmotic pressure – 32 mm of Hg.

Specific gravity – 1025

✓ Ratio between Myeloid : Erythroid tissues == 3:1, Ratio between fat cells : Blood cells == 1:1

Blood contents 45 % Cells & 55 % Plasma.

Cells

1. RBC - – Female – 4 – 5 million /cu mm
2. Male – 5 – 6 million/cu mm
3. Infant – 6 – 7 million/cu mm
4. Sape - Biconcave
5. Size -7.5u (12.5u in seciameter)

Plasma

- 92% Water , 1% Non Carbonic
7% Carbonic – Albumin 4.4%
 Globulin 2.3%
 Fibrogen 0.3%
 SERUM == Plasma – fibrin

<p style="text-align: center;">Platlets Count</p> <p>1.5 – 4.5 lac/cu mm</p> <p>Creatical Value – less than 40000/ cu mm</p> <p style="text-align: center;">WBC Count</p> <p>WBC – 6000 – 11000/ cu mm</p>	<p style="text-align: center;">Haemoglobin</p> <p>Male – 14-16 gm/100ml</p> <p>Female – 12-14 gm/100ml</p> <p>Neonate – 18-20 gm/100ml</p> <p>In Pregnancy – 10.5gm/100ml</p>
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WBC

1. Granulocytes	2. Agranulocyte
<p>1. Neutrophils</p> <ul style="list-style-type: none"> - 60-70% = 3000-6000/cu mm - Rise in pus forming infection 	<p>1. Monocyte</p> <ul style="list-style-type: none"> -Largest WBC, -5 -10 % =350 -800/cu mm -Phagocytic cells - Rise in T.B. ,KaLa Azar ,Malaria
<p>2. Eosinophils</p> <ul style="list-style-type: none"> - 1-4% =150-400/cu mm - Non phagocytic WBC - High content of Histamine - Rise in Allergies, parasitic infection 	<p>2. Lymphocyte</p> <ul style="list-style-type: none"> - 20 -30% =1500 -2700/cu mm - Non phagocytic cell - Humoral /Antibodies mediated Immunity
<p>3. Basophiles - 0.5 -1% = 100/cu mm</p> <ul style="list-style-type: none"> - Non phagocytic ,smallest - Mast cell secrete --Heparin - Increase in chicken pox 	

Non phagocyte cells ---- (BEL) ----- Baso, Eosino, and Lymphocyte

Neutro ----- Lympho -----Mono -----Eosino -----Baso

70 % 20% 5% 4% 1%

Blood cells	Size	Life span
RBC	7.2 micron	120 days
WBC -		1-15 days
Platlets		9-11 days
Basophils	9 – 15 micron	12-15 days
Eosinophils	10 – 15 micron	8-12 days
Neutrophils	10 – 15 micron	2-4 days
Lymphocytes	12 – 15 micron	1-3 days
Monocytes	25 – 30 micron	2-8 days

Platelets 9 – 11days

Blood Clotting

Bleeding Time 2–5 min, Coagulation Time 5–8 min, Prothrombin Time 11–15 sec

Disease	Bleeding Time	Coagulation Time	Prothrombin Time
Haemophilia	Normal		Normal
Christmas disease			Normal
Purpura		Normal	

Blood clotting factors -13 Discovered by Mark land,Macferlance in 1954.

1. Fibrinogen
2. Prothrombin
3. Thoromoplastin
4. Calcium - Ca⁺⁺
5. Proaccelerin
6. Accelerin
7. Proconvertin
8. Anti heamophilic factor
9. Christmas factor
10. Stuart factor
11. Plasma thromboplastin antecedent(PTA)
12. Hageman factor (Glass contact factor)
13. Fibrin Stabilizing factor

1, 2, 5, 7, 9, 10 Blood coagulation factor produced in liver.

Landsteiner law is regarding blood group

Blood group	Agglutinogen/antigen (on the cell membrane of erythrocyte)	Agglutinin/antibody (found in plasma content serum globulin)
A	A	Anti B
B	B	Anti A
AB	A and B	Nil
O	Nil	Anti A & B

- Commonest Blood group O
- Blood group O -ve is universal donor, Blood group AB +ve is universal recipient.
- For an AB individual if AB blood group is not available A is better than B
- Blood group O is more prone to –
Duodenal ulcer & gastric ulcer, Rheumatic heart disease, Hemolytic tendency, Laprosy
- Blood group A is more prone to –
Carcinoma of stomach, Carcinoma of cervix, Pernecious anemia, Thrombosis.

Erythroblastosis foetalis occurs in - Rh + male + Rh - female

It is also known by the name of HDN (hemolytic disease of new born) or icterus gravis neonatorum

Blood formation-

- start from 3rd week of intra uterine life
- 3rd week- 3rd month → RBC forms in mesoderm of yolk sac
- 3rd month- 5th month → RBC forms in liver
- Post natal erythropoiesis → in red bone marrow
- **After the age of 20 years – RBC form in red bone marrow** of Flat bone (sternum, Ribs ,vertebra)
- ✓ RBCs are destroyed in spleen and liver and bone marrow

- :: E.S.R. = Erythrocyte Sedimentation Rate ::-

Male 0-9 mm/hr (Wintrob method)
 Female 0-20 mm/hr

E.S.R. decrease	E.S.R. increase	E.S.R. Very rapid increase
Polycythemia Congestive Cardiac Failure Whooping Cough Dehydration	Pregnancy from 4 th month Anaemia (Except- Sickle Cell) Tuberculosis Acute Gout Burns & tissue damage Acute infection After fracture & operation	Kala Azar Leukaemia Sarcoidosis Chronic renal disease

MENSTRUAL CYCLE :- Unsafe period == 11th to 18th day.

1st to 4th day == Bleeding phase
 4th to 14th day == Proliferative / Follicular phase
 On 14th day == Ovulation occur
 14th to 28th day == Secretary /Luteal phase

Distribution of cardiac output	
Liver = 1500 ml/min [25%]	Heart = 225ml/min [5%]
Kidney = 1300 ml/min [22%]	Muscles = 100 –200 ml/min [2-5 %]
Brain = 1000 ml/min [20%]	Spleen = 50 ml/min [1%]

--- ::: MAIN VOLUMES :::--

Tidal volume (Vt) --Volume of air inspired/expired by an individual per respiratory excursion at rest
 (Vt) = 500 ml

Residual Volume (Rv) -- After even the severest expiratory effort , the lungs still contain some air called Residual volume == 1500ml

Inspiratory Reserve volume (IRV) = 3000 ml
 Expiratory Reserve volume (ERV) = 1000 ml
 Inspiratory capacity Ic = IRv + Vt = 3500 ml
 Functional residual Capacity (FRC) = 4800 ml

Number of alveoli in 2 lungs == 3000 million

----::: FUNCTION Of BRAIN :::----

- (1) **Cerebral hemisphere** – Intelligence, Will power, Imagination, Knowledge, Reasoning, Weeping and Laughing + micturation, defecation.
- (2) **Limbic system** ::-- Rage and panic, Emotions and sexual behaviour
- (3) **Hypo thalamus** ::-- Hunger , Thirst, Temperature, Fatigue, Satisfaction, Love, Hate, copulation + ANS ,endocrine gland secretion .
- (4) **Medulla Oblongata** ::-- Heart rate , Respiratory center, Blood pressure, Peristalsis of the alimentary canal, Exocrine gland secretion, swallowing, sneezing, coughing and Vomiting
- (5) **Cerebellum** : - Movement of the body and balance

Funtion	Center
Smell	Olfactory lobe
Speech	Broca's area of cerebrum
Vision	Anterior optic lobe of mid brain
Auditory	Posterior optic lobe of mid brain

-:: 12 Cranial Nerves ::-

N	Name	Origin	Function	Distribution
1	Olfactory	Olfactory lobe	Smell	Nasal mucus membrane
2	Optic	Retina	Sight	Retina
3	Oculomotor	Floor of Aqueduct of sylvius	Motor	All ocular muscles except LR & SO
4	Trochlear	Floor of Aqueduct of sylvius	Motor	SO
5	Trigeminal	Midbrain & pons	Mixed	Skin of face, tongue, teeth.
6	Abducent	Pons	Motor	LR
7	Facial	Pons	Mixed	Muscles of expression
8	Vestibul	Brain	Sensory	Internal auditory meatus
9	Glosso pharyngeal	Medulla oblongata	Mixed	Sensation of pharynx, Posterior third of tongue, Parotid Gland
10	Vagus	Medulla oblongata	Mixed	Pharynx, Larynx, Heart, lungs Oesophagus, stomach, abdominal vire
11	Accessory	Medulla oblongata	Motor	Sternomastiod, Trapezius muscles
12	Hypoglossal	Medulla oblongata	Motor	Intrinsic muscles of tongue

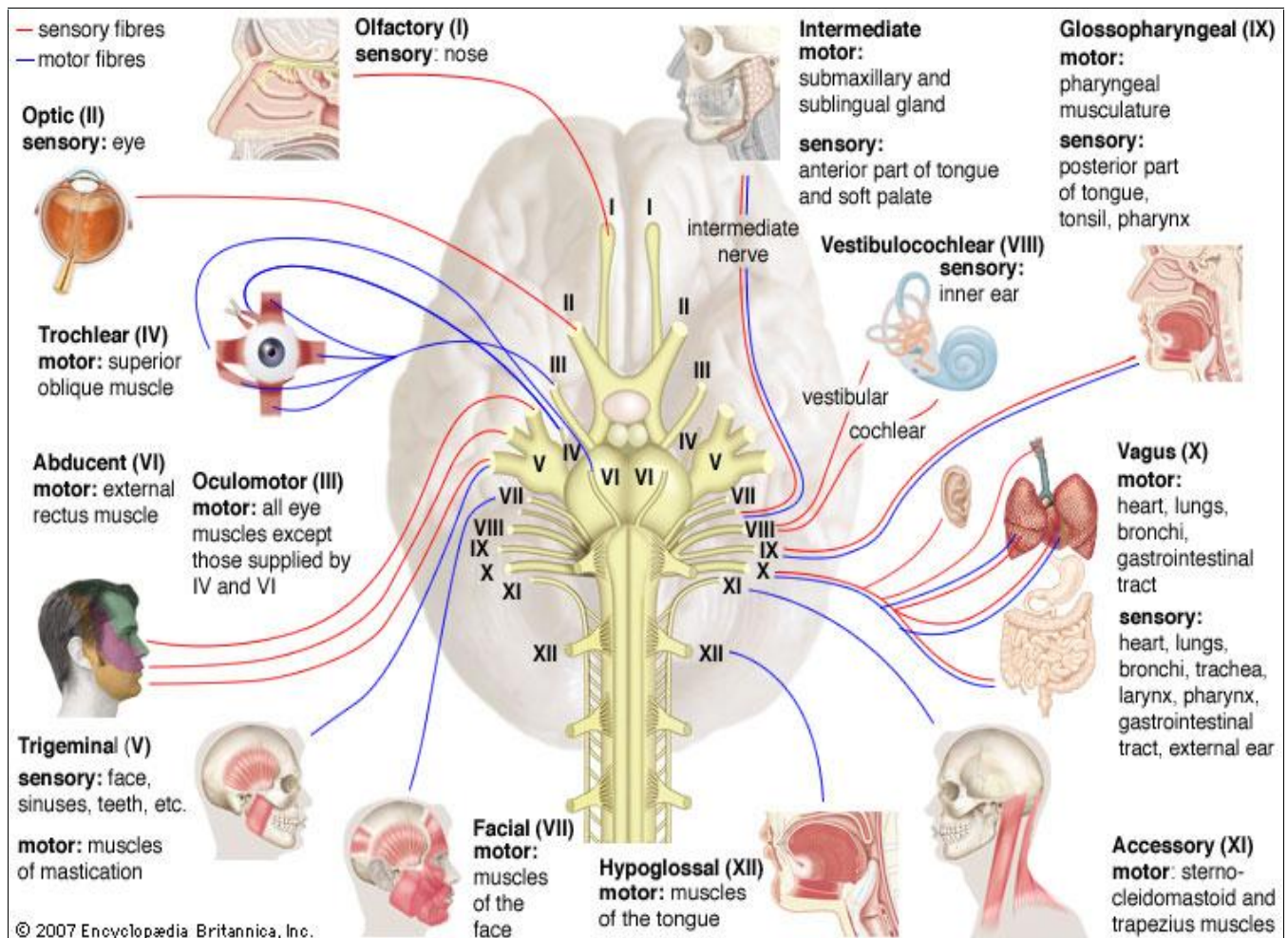
Censory nerves = 1,2, 8 Motor nerves = 3,4,6,11,12 Mixed nerves = 5,7,9,10

Largest & Thickest cranial nerve 5th Trigeminal.

Longest cranial nerve 10th Vagus

Smallest cranial nerve 6th Abducent

Thinnest cranial nerve 4th Trochlear



CARDIAC - CYCLE

The [cardiac cycle](#) is the sequence of events that occur when the heart beats. There are 2 phases of this cycle.

[Diastole](#) - Ventricles are relaxed.

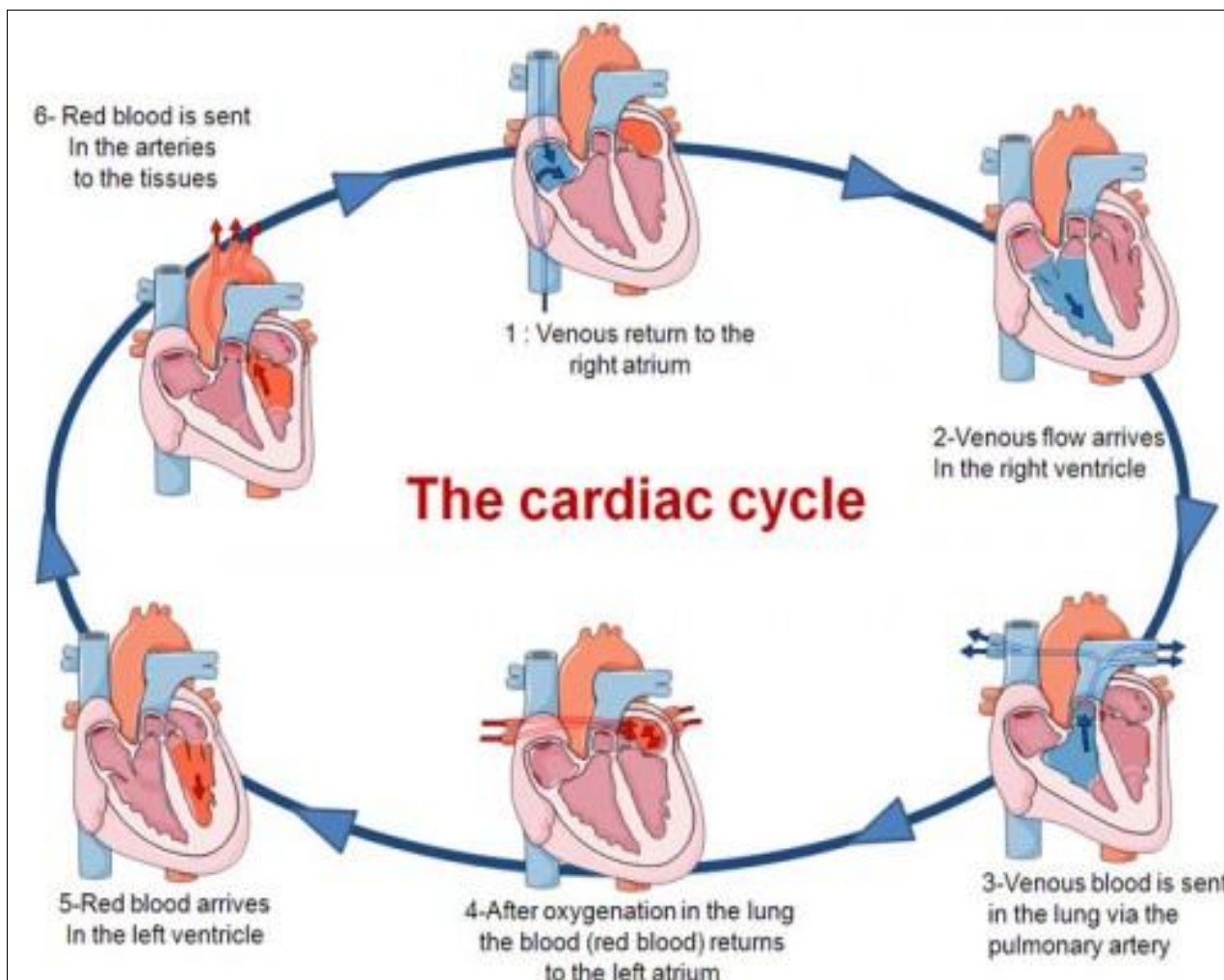
[Systole](#) - Ventricles contract.

During the diastole phase the atria and ventricles are relaxed and the [atrioventricular valves](#) are open.

De-oxygenated blood from the superior and inferior [vena cava](#) flows into the right atrium. The open atrioventricular valves allow blood to pass through to the ventricles. The [SA node](#) contracts triggering the atria to contract. The right atrium empties its contents into the right ventricle. The [tricuspid valve](#) prevents the blood from flowing back into the right atrium.

During the systole phase the right ventricle receives impulses from the [Purkinje fibers](#) and contracts. The atrioventricular valves close and the [semilunar valves](#) open. The de-oxygenated blood is pumped into the [pulmonary artery](#). The [pulmonary valve](#) prevents the blood from flowing back into the right ventricle.

The pulmonary artery carries the blood to the lungs. There the blood picks up oxygen and is returned to the left atrium of the heart by the [pulmonary veins](#).



Duration of the cardiac cycle = 0.8 sec

Atrial systole	0.1 Sec
Atrial Diastole	0.7 sec
Ventricular systole	0.3 sec
Ventricular Diastole	0.5 sec

Normal heart rate :-

In Adult	= 72/min
In Fetus	= 140/min
In new born	= 120/min
Heart beat	= 60 / 72 = 0.8 sec

Ventricular systole	Ventricular Diastole
1. Iso volumetric contraction = 0.05 sec	1. Proto diastolic phase = 0.04 sec
2. Ejection phase == 0.25 sec	2. Isovolumetric relaxation = 0.06 sec
1- Rapid ejection == 0.10 sec	3. Filling phase = 0.4 sec
2- Reduced ejection == 0.15 sec	First rapid filling phase = 0.10 sec
	Diastasis = 0.20 sec
	Last rapid filling phase = 0.10 sec.
Total == 0.3 sec	Total = 0.5 sec

1st Heart sound ::---

- Prolonged and loud like ‘LUB’ & Due to closure of mitral and tricuspid valves.
- It shows the beginning of the ventricular systole
- Duration of sound == 0.09 – 0.16 sec
- It is more intense in the left ventricular hypertrophy
- It is more be replaced by ‘murmur’ in mitral incompetence.

2nd Heart sound ::--

- short and sharp like “DUPP” & Due to closure of semilunar valves.
- It indicate the clinical end of the systole & clinical beginning of the diastole duration = 0.10-0.12sec
- In aortic incompetence second heart sound is replaced by “murmur”

3rd Heart sound ::--

- It produce due to vibration of the ventricular.
- Due to Rush of the blood in to nearly empty vessels.

4th Heart sound ::--

- It is also called ‘atrial sound’ because it produced due to atrial contraction.
- Due to Rush of the blood in to empty ventricle.

(Normally only First and Second heart sound are heard)

BLOOD PRESSURE

Blood pressure - lateral pressure in the systemic arteries.

Systolic B.P. (SBP) = Highest B.P. recorded during a cardiac cycle = 120 mm Hg

Diastolic B.P.(DBP) =Lowest B.P. recorded during a cardiac cycle = 80 mm Hg

Normal value of B.P. ::--

DBP < 85 mm Hg == Normal

SBP < 140 mm Hg == Normal

DBP > 90 mm Hg == High

SBP > 160 mm Hg == High

According to age :: --

17 years adult == 120 / 80 mm Hg == Normal

At the Age of 70 year == 140/80 mm Hg == Normal

B.P. == Cardiac output X peripheral resistance == Arterial pressure.

Pulse Pressure – SBP – DBP = 40 mm of Hg

Mean arterial Pressure = 80 + 1/3 X 40 = 93 mm of Hg

Marey’s law ==Heart rate = 1/ B.P. = If B.P. is high than Heart rate is low

But in Exercise Heart rate and B.P. both Increase.

(A) जल में घुलनशील विटामिन

विटामिन	Name	स्रोत	कमी का प्रभाव
B ₁ or Antineuritis factor	Thaimine	टनाज, फलियां, दूध, मांस, अण्डे, यकृत	Beri-Beri, Polyneuritis,
B ₂ or vitamin G	Riboflavine	पनीर, अण्डे, यीस्ट, यकृत मांस	Cheilosis, Angular Stomatitis
B ₃ or antidermititis factor	Pantothenic acid	यकृत, वृक्क, यीस्ट, गुड, अण्डे, आलू, टमाटर	3 D - Dermatitis, diarrhoea, & dementia
B ₅ or r Pellagra Preventing factor	Nicotinic acid	यकृत, वृक्क, दूध, यीस्ट, अण्डे, मूंगफली	Pellagra – जिहवा व त्वचा पर पपड़ियाँ पड़ना।
B ₆	Pyridoxine	यीस्ट, यकृत, वृक्क, मांस, मछली, ब्रेड	Microlytic Anemia
B ₇ or Vitamin H	Biotin	यकृत, यीस्ट, वृक्क अण्डपीतक, दाले,	Dermititis, बालों का झड़ना
B ₉ or vitamin M	Folic acid	वृक्क, यकृत, मशरूम, सोयाबीन, गेहूँ,	Megaloblastic Anemia
B ₁₂ or Erythrocyte maturation factore	Cynocobalamine	यकृत, अण्डे, मांस, दूध	Pernicious Anemia
Vit. C	Ascorbic acid	नींबू, आंवला, हरी मिर्च, फल, टमाटर	Scurvy

(B) वसा में घुनलशीन विटामीन –

विटामिन	Name	स्रोत	कमी का प्रभाव
Vit. A or Or anti xerophthalmic	Retinol Or Anti infective vit	दूध, अण्डा, मक्खन, मछली का तैल यकृत, गाजर, समुद्री शैवाल	Night blindness, toad skin Xerophthalmia, keratomalacia
Vit. D Or sunshine vitamin	Calciferol Or Anti ricketic vitamin	मछली का तैल, दूध, मक्खन, व त्वचा में UV विकिरणों द्वारा संश्लेषण	Rickets, Osteomalacia, Tetany, Dental Carries
Vit. E	Tocoferol	हरी पत्तियां, गेहूँ, अण्डों की जर्दी	Sterility
Vit. K or Anti haemorrhagic vit.	Napthoqumone	अण्डा, यकृत, पनीर, हरी पत्तियां,	Hypoprothrombinemia रक्त संकदन नहीं हो पाता है।

Vit.	Useful in tratement of	Vit.	Deficiency can cause
A	Measles	C, D	Pseudo Paralysis
C	Methamoglobinemia, Alcaptonuria	B ₆	Convulsions
D	Tuberculosis	K	Haemolysis, Neonatal Jaundice
B ₆	Bronchial Asthma		
E	Peripheral vascular disease		

- ❖ Lunin ने विटामिन की खोज की एवं Funk ने Vitamin नाम दिया।
- ❖ Vitamin which is an antioxidant Vit. E
- ✓ Heat Stable Vitamin Vit. K & B₂,
- ✓ Heat Labile Vitamin Vit. C & B₉ (Folic Acid)
- ✓ Vitamin that are synthesized in Gut = B₂, B₁₂ and K
- ✓ Vitamins that are synthesized in Body = D
- ❖ Dicoumarol is the anti vitamin of Vit. K.
- ❖ Cod liver oil is the richest source of Vit. A
- ❖ Vitamin D does not cross placenta.
- ❖ Vitamins which are stored in Liver A, K, D, and B₁₂
- ✓ Vitamin with which hypervitaminosis can occur A & D.
- ✓ Magenta Red tongue Vit. B₂, Raw beef tongue Vit. B₅

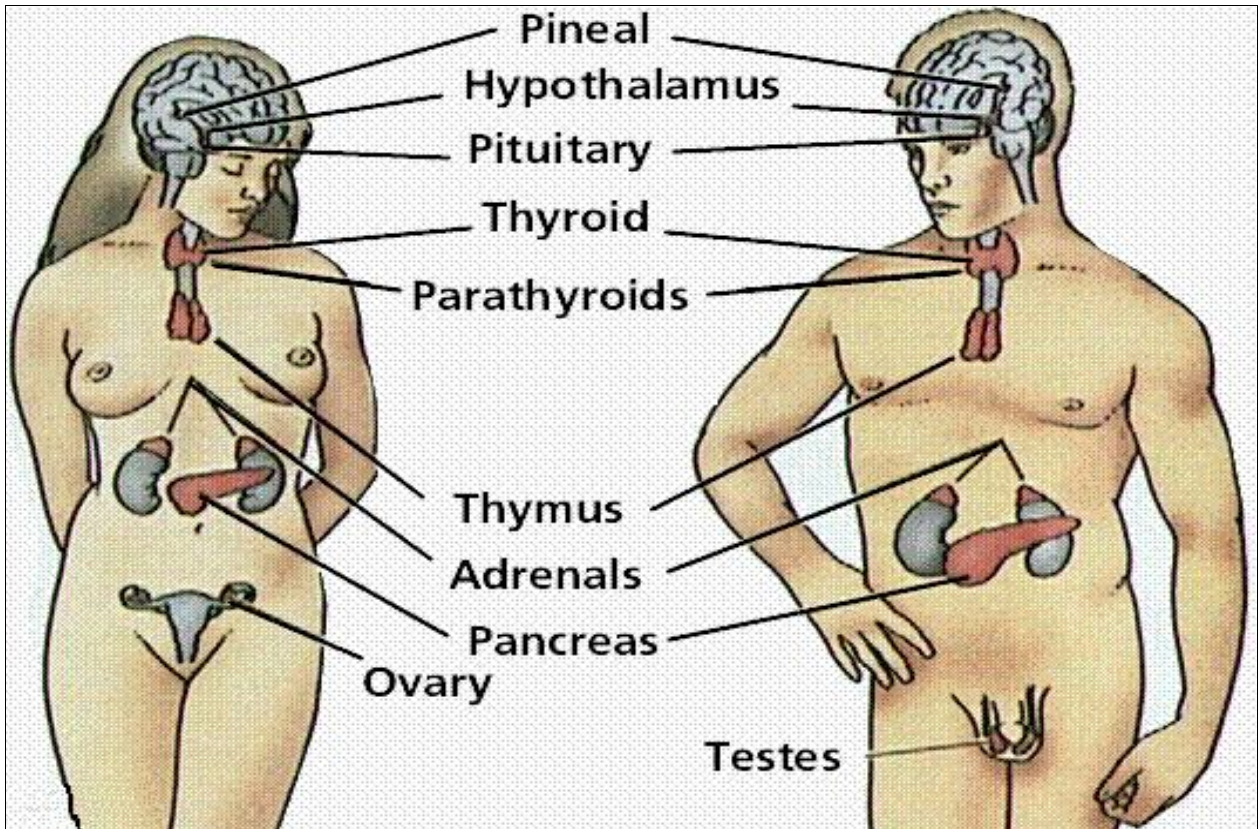
TABLE OF HORMONES

Hormones	Main effect	Hyposecretion	Hypersecretion
1. थाइरॉइड ग्रन्थि			
1. Thyroxine or T4- Tetra-iodothyronine T3/ Tri-iodothyronine Calorigenic hormone	1. कार्बोहाइड्रेट, प्रोटीन, वसा के उपापचय दर (BMR) को बढ़ाता है। 2. हृदस्पंदन दर, शरीर ताप का नियंत्रण। 3. लैगिंग हार्मोन परिपक्वण	1. बच्चों में (Cretinism) 2. वयस्क में (Myxoedema) 3. Simple goitre 4. Hoshimoto disease	1. Exophthalmic goitre 2. Grave's disease 3. Plummer's disease
2. Calcitonin or antiparathormone	मूत्र में Ca ⁺⁺ के स्रावण को बढ़ाकर रक्त में Ca ⁺⁺ की मात्रा का नियमन करना	-	-
2. पैराथाइरॉइड ग्रन्थि			
Parathormone or collip's hormone	सीरम में Ca ⁺⁺ स्तर को बढ़ाता है, फॉस्फेट स्तर को घटाता है।	1. Tetany 2. Hypocalcemia	1. Osteoporosis 2. Hypercalcemia
3. अधिवृक्क ग्रन्थि			
3. अधिवृक्क ग्रन्थि		(A) मेडमूला	
1. Adrenaline 2. Noradrenaline or Neuro hormone	आपात परिस्थितियों में सहयोग प्रदान करने वाले life saving hormone हैं। इसे fight/flight हार्मोन भी कहते हैं।	Hypotension Heart rate B.P. Blood flow in organ	Hypertension Heart rate B.P. Blood flow in organ
		(B) कार्टेक्स	
1. मिनरैलो कॉर्टिकॉइड्स (Aldosterone)	ECF में सोडियम व ca की मात्रा का नियमन करके रक्त दाब का नियंत्रण	1. Addison's disease 2. Conn's disease	1. cushing's disease 2. Adrenal virilism
2. ग्लूको कार्टिकाइड्स (Corticosterone)	Rheumatism और Organ transplantation व Allergy उपचार में सहायक।	-	-
3 लिंग हॉर्मोन्स	पेशियों और जननांगों के विकास में प्रेरक	-	लड़कियों में पुरुष लक्षण
4. पीयूष ग्रन्थि			
(a) ऐडिनोहाइपोफाइसिस			
1. सोमैटोट्रोपिन (STH)/ GH = growth hormone	शरीर की सामान्य वृद्धि, कोशिका विभाजन व अस्थियों की वृद्धि हेतु आवश्यक।	बचपन में – Dwarfism वयस्क में पीयूष मिक्सीडिमा	1 महाकायता / Gigantism अग्रतिकायता / Acromegaly
2. FSH or follicle stimulating hormone	नर के वृषण में शुक्रजनक नलिकाओं की वृद्धि व शुक्रजनन में प्रेरक।	-	-
3. LH or Leutinizing hormone या ICSH	नर में टेस्टोस्टीरोन स्रावण, मादा में अण्डोत्सर्ग हेतु प्रेरक।	-	-
4. प्रोलैक्टिन (PRL)	स्तनों की वृद्धि और दुग्ध स्रावण का प्रेरक	-	-
5. ACTH	ऐड्रीनल कार्टेक्स का प्रेरक हार्मोन्स।	-	-
6. TSH	थाइरॉइड ग्रन्थि का प्रेरक।	-	-
7. मिलैनोसाइट प्रेरक हार्मोन (MSH)	त्वचा में कास्य वर्ण तथा तिलों व चकत्तो के निर्माण का प्रेरक, त्वचा का रंग गाढ़ा करना।	-	-
(b) न्यूरोहाइपोइसिस			
1. Vasopression or ADH	वृक्क नलिकाओं में जल के पुनः अवशोषण को बढ़ाना तथा रक्त वाहिनियों का संकुचन	Diuresis (मूत्रलता) Diabetes insipidus	मूत्र गाढ़ा तथा रक्त तनु हो जाता है।
2. Oxytocin /pitocin	गर्भाशय को दिवार को सिकोडकर प्रसव पीड़ा का प्रेरक, दुग्ध निष्कासन।	-	-

ग्रन्थि	हार्मोन	कार्य
1. थाईमस (Thymus)	Thymosine (थाइमोसीन)	लिम्फोसाइट्स का उत्पादन कर Antibodies के संश्लेषण की प्रेरणा देता है।
2. Pineal body	Melatonin (मिलैटोनिन)	त्वचा का रंग हल्का करना।
3. वृषण (Testes)	1. ऐन्ड्रोजेन्स (Androgens) टेस्टोस्टीरोन Testosterone)	नर में सहायक यौन जननांगों का विकास करना, नर में द्वितीयक लैंगिक लक्षणों को प्रेरित करना उदा.- भारी आवाज, दाढ़ी, मूछों का विकास, मैथूननेच्छा।
4. अण्डाशय (Ovary)	1. ऐस्ट्रोजेन (Oestrogen) 2. प्रोजेक्टीरोन Progesterone 3. रिलैक्सिन (Relaxin)	मादा सहायक जननांगों तथा द्वितीय लैंगिक लक्षणों के विकास को प्रेरित करना। Pregnancy hormone - गर्भधारण के लिए आवश्यक दशाओं का प्रेरक। यह शिशु जन्म के समय श्रोणिमेखला के प्यूबिक सिमफाइसिस को शिथिल करना
5. अपरा (Placenta)	कोरियानिक गोनेडोनिट्रोपीन	कारपस म्यूरियम की वृद्धि व स्रावण का नियमन, गर्भवती महिला के मूत्र में उत्सर्जित होता है।
6. वृक्क (Kidney)	1. रेनिन (Renin)	Aldosteron hormone के स्रावण को प्रेरित करता है। Juxtaglomerular complex द्वारा स्रावित होता है।

— अग्नाशय ग्रन्थि —

Hormone	Main effect	hyposecretion	Hypersecretion
(a) Insulin cells से स्रावित	ग्लूकोज के उपापचय का नियमन, यकृत में गलाइकोजिनेसिस, प्रोटीन, संश्लेषण, वसा संश्लेषण।	1. Hyperglycemia 2. Diabetes mellitus	Hypoglycemia Insulin shock
2. Glucagon cell से स्रावित	रक्त में ग्लूकोज की घटी हुई मात्रा को बढ़ता है। अमीनों अम्ल व वसा से ग्लूकोज का संश्लेषण।	Hypoglycemia	Hyperglycemia
3. सोमेटोस्टेटिन (Somatostatin)	भोजन पाचन, अवशोषण एवं स्वांगीकरण की अवधि को बढ़ाना	-	-



Important point

1. (GH/STH) = Acidophils of adenohypophysis of pituitary gland.
2. TSH, ACTH & LH = secrete from Basophils of pituitary gland.
3. Insulin is a polysaccharide used for G.F.R. measurement
4. $\frac{3}{4}$ of the total body potassium is present in = skeletal muscle.
5. At rest saliva is = Hypotonic.
6. Hypothalamus has highest content of = GABA
7. Dopamine = Inter mediate in tyrosine metabolism and precursor of epinephrine and nor epinephrine.
8. Acetylcholine = is a parasympathetic neurotransmitter.
9. Kupffer's cells are found in the liver.
10. Sertoli cells are found in the testis.
11. Human body contains 22 Amino acids and 24 minerals.
12. Definitely essential fatty acid is Linolenic acid.
13. Strongest acid in the body is heparin which is secreted by mast cells and cause defects of coagulation.
14. Amino acid excreted in urine during pregnancy is Histidine,
15. HB is rich in Histidine and Histamine is formed from Histidine.
16. Energy from protein/ Carbohydrates = 4 Kcal/gm, Fat = 9 Kcal/gm
17. Hyaluronidase enzyme present in testes and semen.
18. Lymphoid tissues = Lymph node, Thymus and spleen
19. Respiratory rate : Heart rate = 1:4
20. Hb == 4 Hb + 1 globulin.
21. Disulphide bonds are seen in – Insulin, Immunoglobulin, Cystine.
22. End product of the starch metabolism is Maltose.
23. Glactose is the best absorbed sugar.
24. Glyeogen is also called animal sugar.
25. Maltose = glucose + glucose
 Sucrose = glucose + fructose
 Lactose = glucose + galactose
26. Death occurs usually when the pH of blood falls to 6.9
27. Krebs Henselite cycle is synonym of Urea cycle.
28. Lactic acid cycle is synonym of Cori's cycle.
29. Glycolysis is synonym of EMP pathway
30. Citric Acid cycle or tricarboxylic Acid is synonym of Krebs cycle.
31. The term "Cell" was introduced by Robert Hooke.
32. The normal ICF (intracellular fluid) concentration of Cl⁻ ions (mEq/litre) is about – 10.
33. The normal ICF (intracellular fluid) concentration of K⁺ ions (mEq/litre) is about – 140.
34. The Sahil's method is used for estimating – Hb
35. The 'Milk injury' is related to the deficiency of – Fe.
36. BMI (Body Mass Index) = $\frac{\text{Weight (kg)}}{\text{Height}^2 \text{ (m)}}$

Category	BMI range – Kg/m ²
Starvation	Less than 14.9
Underweight	from 15 to 18.4
Normal	from 18.5 to 22.9
<u>overweight.</u>	from 25 to 30
Obese	30 & above

37. The Normal T₃ : T₄ concentration ratio in blood is about = 5 : 95