

Name: _____

HBS STUDY GUIDE

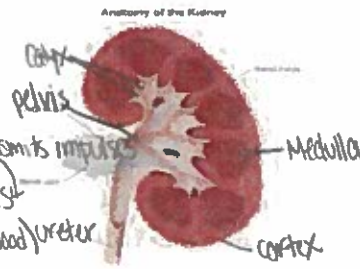
Endocrine System

gland	hormone	function
pituitary		
adrenal		
pancreas	Other sheet	
thyroid		
ovaries		
testes		

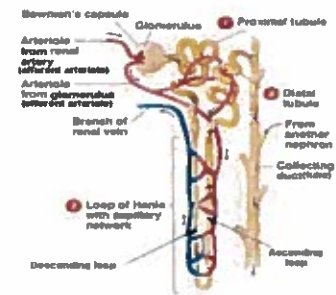
Urinary System

normally in urine: water, salt, urea
 (called filtrate)
 Not normally: glucose, protein, WBCs,
ketones, RBCs

Kidney



Nephron



substances reabsorbed into blood: water, NaCl, K⁺

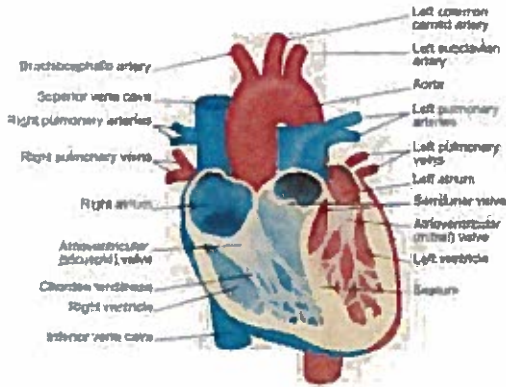
Tissue Types

- Nervous - nerve cells (neurons) that receive & send electrical signals
- Connective - protect, support, hold together other tissues (bone, cartilage, blood, ureter)
- Epithelial - forms lining, covering & glandular tissue (ABC)
- Muscular - contracts & causes movement (skeletal, cardiac, smooth)

Integumentary System

- Epidermis - protects inner layer of skin
- Dermis - gives flexibility & strength
- contains: nerve ends & blood vessels, hair follicles
- Adipose tissue - fat beneath the skin

Circulatory System



blood	antigens	antibodies
A	A	Anti B
B	B	Anti A
AB	A+B	none
O	none	Anti A+B

Universal donor: O

Universal receiver: AB

Action Potential - impulse, 4 stages

- 1) resting -
- 2) depolarization - *Other sheet*
- 3) repolarization -
- 4) return to resting -

Nervous System and Urinary System diseases/disorders:

Epilepsy - Bursts of electricity cause involuntary responses (seizures, odd smells, etc)

Parkinson's - Cells that make dopamine die. The lack of this neurotransmitter causes problems in communication between neurons in the two brain regions that must communicate to allow smooth, controlled movements

Huntington's - Genetic defect on chromosome 4 (excess CAG repeats) causes synthesis of abnormal protein—the protein disrupts function of certain nerve cells, ultimately leading to their deaths (dead cells can't communicate)

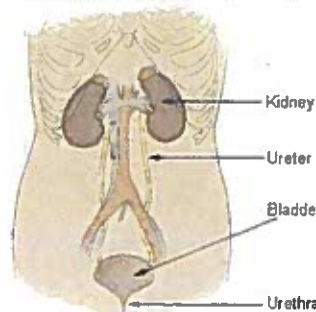
Alzheimer's - Brain cells die, acetylcholine not produced—communication breaks down, getting worse with time and eventually causing death

Multiple Sclerosis - The immune system attacks the myelin around nerve axes in the brain, spinal cord and optic nerves, causing nerves to be unable to transmit messages due to a buildup of scar tissue

Amyotrophic lateral sclerosis - (Lou Gehrig's) Nerve cells waste away or die and can't send messages to the lower motor neurons. Movement becomes less and less controlled. Eventually the lung muscles cannot contract, causing death.

Urinary System

Components of the Urinary System



cell respiration → ATP → Energy released for life activities
 ADP ←

agglutination = clumping

- Gestational diabetes: pregnant and glucose in urine
- ketu acidosis: excess ketones in urine
- UTI: WBC in urine
- diabetes insipidus: pituitary doesn't make ADH: Excrete large amounts of urine
- Chronic kidney: nephrons not working; blood in urine

Biometrics used to confirm identity:

- finger prints
- voice recognition
- signature
- retinal scan
- vein tree

Forensics:

- What bone is used for race? skull femur
- gender? pelvis, head
- Height? femur
- tibia, fibula
- numerus, ulna, & radius

DNA Electrophoresis

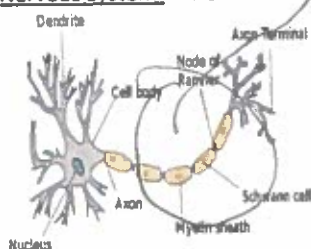
restriction enzymes: Cuts DNA
 polarity of DNA: -
 speed of travel: smaller fragments move fastest
 cutting DNA into fragments: HindIII enzyme - cuts at GAATTC

Fragments: 10, 10, 7

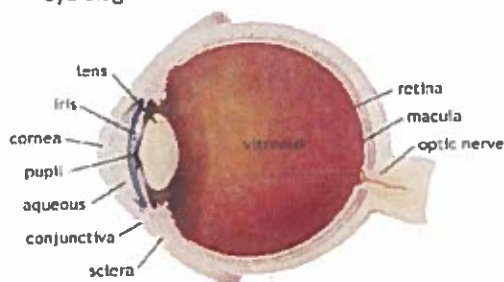
AACGGTTGTGAAATTCGGTCCCACGAAATTCACGTAA
 TTGCCAACACTAAGCCAGGGTGCCTAAGTGCATT

dendrite → cell body → axon →

Nervous System- neuron



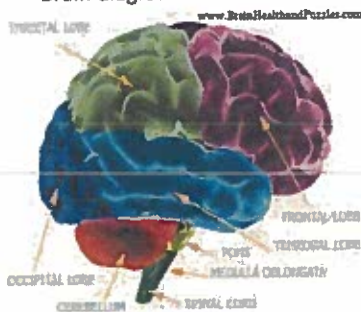
eye diagram



brain part function

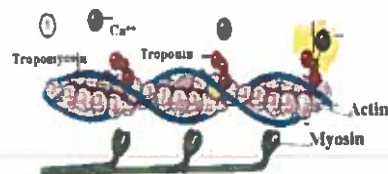
brain part	function
cerebrum	Consists of 4 lobes
occipital	
temporal	
parietal	
frontal	<u>other sheet</u>
medulla	
cerebellum	
Limbic system	

Brain diagram



Sliding Filament theory

Ca²⁺ ions - binds to troponin
 troponin - shifts tropomyosin
 tropomyosin - shifts to expose actins
 actin - slide past myosin for contraction
 myosin - needs ATP to fit to binding site
 sarcoplasmic reticulum - release Ca²⁺ ions



Muscular System

- Origin - where it came from
- Insertion - where it goes
- Lateral - on the side
- Medial - towards the middle
- Proximal - close
- Distal - far

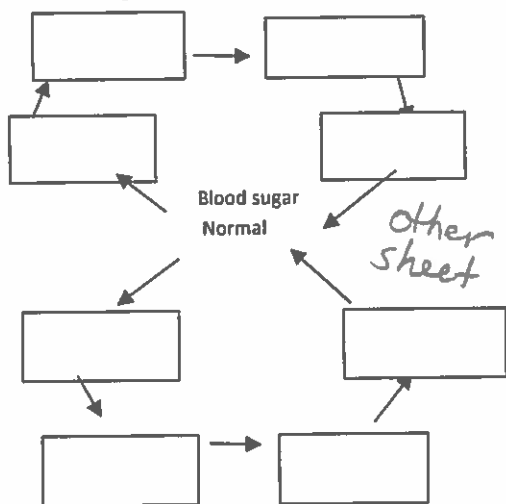
Joint types

- ball and socket - shoulder, hip
- gliding - wrist, ankle
- condyloid - fingers
- saddle - thumb
- pivot - neck
- hinge - elbow & knee

muscle name origin insertion

muscle name	origin	insertion
Biceps brachii	scapula	proximal radius
Triceps brachii	opp. of bicep	proximal ulna
pectoralis	sternum	proximal humerus
Gluteus major		
quadriceps	femur	tibia
Biceps femoris	dorsal pelvis	fibia/tibula
gastrocnemius	patellar	calcaneus
Tibialis anterior	proximal tibia	meta tarsals

Blood sugar level feedback loop



Digestive System

nutrient	enzyme	works here	function
carbs	amylase, sucrase, lactase	mouth → s. intestine	double sugars → simple sugars
proteins	trypsin & pepsin	stomach → s. intestine	dipeptides → amino acids
lipids	lipase	s. intestine	fatty acids & glycerol

Skeletal system fracture types

- Transverse: right &
- Oblique: sloped or curved
- Compression: spinal collapse
- Comminuted: shattered
- Spiral: twisted bone
- Depression: skull smashed in

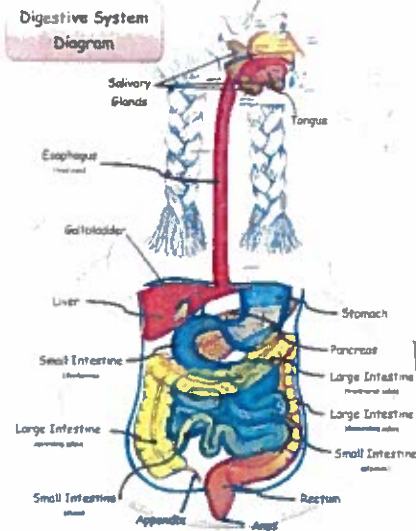
Bones to know:

Patella: knee
 Metatarsals: feet bones
 Cervical vert: spine (neck area)
 Radius: bone by thumb
 Clavicle: neck

carpals: wrist
 phalanges: fingers
 thoracic vert: neck → ribs in back
 femur: thigh
 scapula: shoulder blade

tarsals: ankle
 sacral vert: by butt
 humerus: upper arm
 tibia: shin
 cranium: head

metacarpals: hand bones
 lumbar vert: lower back
 ulna: bone by pinky
 fibula: back leg bone



Digestive System organs and functions

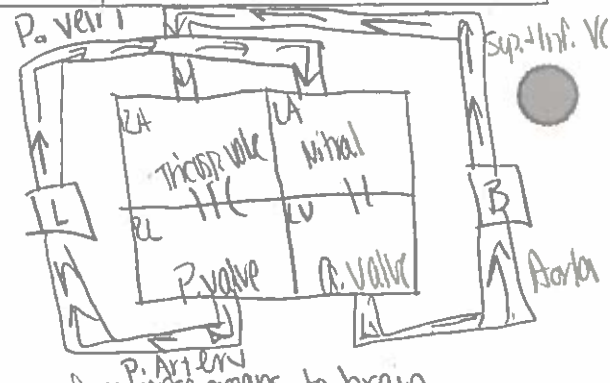
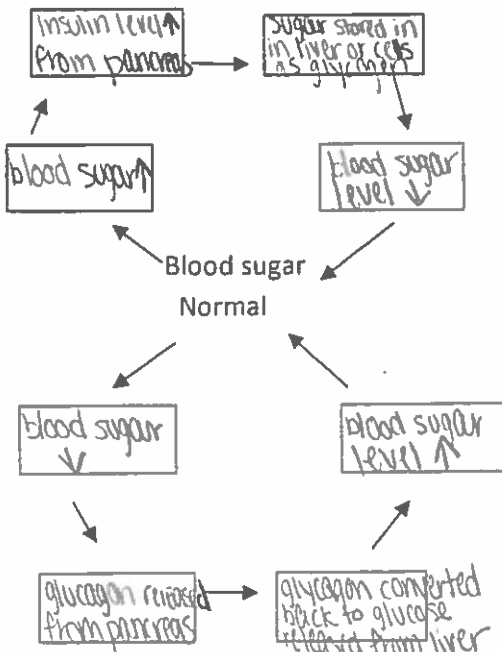
Organ	enzyme	function
Mouth		
Esophagus		
Stomach		
Gall bladder		
Liver		
Small intestine		
Pancreas		
Large intestine		
Anus		

Accessory: Food to enter

Difference between neg. feedback and pos. feedback:

releases to lower
 Blood sugar level feedback loop

keeps it or keeps it down



3 types of neurons: sensory - from sense organs to brain

Interneurons - relay station between sensory & motor neurons. Brain & spinal cord
 motor - from brain to muscle/gland to response

Disorders and how they affect multiple body systems:

- ALS
- Parkinson's
- MS
- Alzheimer's
- Cushing's
- Epilepsy
- Huntington's

*Pancreas enzymes start to work before small intestine
 *Absorption is last.

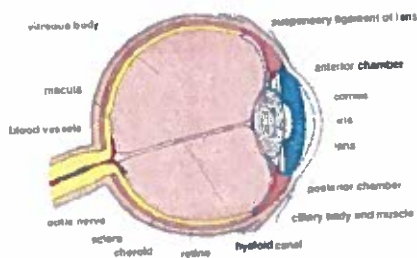
Endocrine System

land	hormones	target	Functions
Pituitary			
Adrenal			
Pancreas			
Thyroid			
Ovaries, Testes			
Hypothalamus			

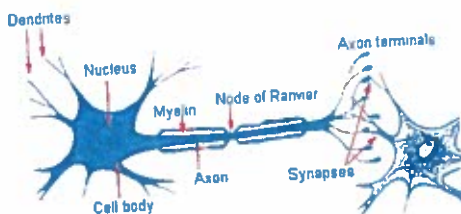
Na⁺ = sodium K⁺ = potassium
Action Potential - impulse 4 stages

- 1) Resting - Na⁺ outside, K⁺ inside
- 2) depolarization - Na⁺ goes to inside of cell
- 3) repolarization - K⁺ goes to outside of cell
- 4) return to resting - the pump brings 3Na⁺ out, 2K⁺ in

Eye diagram



neuron



Forensics

What bone is used for Race? skull, femur
Gender? pelvis, head
Height? femur
tibia, fibula
humerus, ulna, radius

process of DNA Electrophoresis
restriction enzymes: cuts DNA
hot water bath: puts out body temp
buffer: ions in water for electricity to
wells in gel: hold DNA
staining: so you can see it

Brain part function

Brain part	function
cerebrum	Consists of 4 lobes
occipital	
temporal	
parietal	
frontal	
medulla	
cerebellum	
Limbic system	

Pathway through eye

cornea → aqueous humor → pupil → lens → vitreous humor → retina → optic nerve

Terms to know:

- Anterior: front side
- Ventral: front side
- Thoracic: where heart & lungs
- Patellar: knee
- Orbital: eye
- posterior: back side
- dorsal: back side
- axillary: armpit
- brachial: arm
- cephalic: head

- superficial: near surface
- proximal: close to
- popliteal: back of knee
- olecranal: elbow
- coxal: hip

- deep: deep cut
- distal: far from
- antecubital: front of elbow
- buccal: cheek
- calcaneal: heel

B.P.

Gland	Hormones	Target	Functions
Pituitary	FSH (follicle stimulating hormone) TSH (thyroid stimulating hormone) HGH (human growth hormone) LH (luteinizing hormone) ADH (anti diuretic hormone) ACTH (adrenocorticotropic hormone) Prolactin Oxytocin	Testes and ovaries Thyroid Bones and muscles Gonads Kidneys Adrenal glands Mammary glands Mammary glands and uterus	Produces sperm and eggs Causes thyroid to make its hormone Bone and muscle production Males: regulates testosterone Females: responsible for ovulation Makes kidneys keep water in the blood Causes adrenal gland to make its hormone Produces milk Makes uterus contract in childbirth
Adrenal	Adrenalin Cortisol aldosterone	Muscles, lungs, heart Blood Blood and kidneys	Up heart rate, up oxygen, up blood Controls stress, down blood pressure Controls blood volume (water)
Pancreas	Insulin Glucagon	Liver and cells	Lowers blood sugar level Increases blood sugar level
Thyroid	Thyroxin calcitonin	Cells Blood/bones	Metabolism-energy production Decreases Ca ²⁺ level in blood
Ovaries	Estrogen progesterone	Uterus, mammary uterus	Menstrual cycle, 2 nd sex charact. Menstrual cycle, preg-uterine lining
Testes	testosterone	Vocal chords, follicles, muscles	2 nd sex characteristics
Hypothalamus	CRH (corticotropin releasing) TRH (thyrotropin releasing) GHRH (growth hormone releasing) GnRH (gonadotropin releasing)	Pituitary	Controls ACTH release from pituit. Controls TSH release Controls HGH release Controls LH and FSH release

Brain part	Function
Cerebrum	Consists of 4 lobes
Occipital	Visual processing center
Temporal	Hearing and controls speaking and words
Parietal	5 senses and navigation
Frontal	Reasoning, planning, speech, movement, emotions
Medulla	Breathing, blood pressure, thirst and hunger
Cerebellum	Muscle coordination, balance, movement
Limbic system	Hypothalamus, amygdala, hippocampus; motivation, emotion, learning, memory, where subcortical structures meet cerebral cortex

Digestive System Organs and Functions

Organ	Enzyme	Function
Mouth	Salivary amylase	Carbs into simple sugars, disaccharides
Esophagus	Mucus (not enzyme)	Aids movement of food to stomach: peristalsis
Stomach	Gastric juice: pepsin Hydrochloric acid (not enzyme)	Proteins into peptides and protease Effective action of pepsin on proteins
Gall bladder	bile (not enzyme)	makes bile stores bile
Liver	Bile (not enzyme)	Breaks down fat mechanically into small droplets (emulsification) makes
Small intestine	Intestinal juice: peptidase Maltase	Break down peptides into amino acids Breaks down maltose into glucose

RA → tricuspid valve → RV → Pul. valve → Pul. artery → lungs → aorta →
 hemoglobin in RBCs pick up O₂ → Pulmonary vein → LA → Mitral valve →
 LV → aortic valve → aorta → heart

Pancreas	Pancreatic juice: amylase Trypsin Lipase	Continues digestion of starch to disaccharides Digests peptones & protease into small amino acid groups (peptides) Digests fat droplets into fatty acids and glycerol
Large intestine	None	Absorbs water from undigested materials; forms feces
Anus	None	Proximate feces

-arteries thicker, deeper, muscular