

# NLN Exam Study Guide

Patton, K. & Thibodeau, G. (2000) Mosby's Handbook of Anatomy and Physiology. St Louis, MS Mosby.

## A. The Animal Cell

- 1) The organelles & their function, see list page 41
- 2) The cellular membrane – Phospholipid bilayer non-polar tails pointing toward each other. Function of Cholesterol
- 3) How things get inside & outside a cell?
  - a) Osmosis
  - b) Diffusion – facilitated diffusion
  - c) Active transport
  - d) Pinocytosis, phagocytosis, exocytosis
  - e) Sodium pump
  - f) Calcium channel/pump – membrane channels
- 4) Energy production in the cell in the Mitochondria and Cellular Respiration: Glycolysis, Lactic acid/Krebs cycle
- 5) Energy production/source in DM (i.e. what happens when insulin is not present and glucose is not available for energy prod)
- 6) Cellular life-cycle, cellular growth and reproduction, RNA vs. DNA, Meiosis vs. mitosis, haploid vs. diploid state
- 7) Protein Synthesis and the Major components of Amino Acids, Major function of Lipids (types)

## B. Primary Germ layer tissue types, Ecto, Meso, Endoderm

- 1) Glandular tissues types and where?
- 2) Types of membranes

## C. The skin – structures & function

- 1) The layers and components of the skin layers
- 2) Rule of nines-burns
- 3) Appendages of skin (hair, nails)

## D. Types of Bone and Joints

- 1) Compact vs. Spongy, long, flat, short, irregular bone, location and purpose
- 2) Bone modeling and remodeling – Growth and Absorption
  - a) bone growth osteoclasts vs. osteoblasts
- 3) Function of ligaments & tendons  
Def. of movement and body positions: rotation, flexion, extension, rotation in relation to long bones & major joints.

## E. Types of Muscle

- 1) Skeletal, Cardiac, Smooth
- 2) Major events in muscle contraction – mechanism -minerals i.e.,  $Ca^{++}$

**F. Fetal blood flow**

- 1) Structure of heart
- 2) Blood flow through heart valves

**G. Adult Heart**

- 1) Heart sounds – S1 S2 S3 S4 causes, types of murmurs
- 2) Cardiac cycle diastole & systole
- 3) Basic EKG
  - a) P wave – pr interval
  - b) QRS
  - c) ST Interval
  - d) T wave
  - e) What they relate to in function (i.e. depolarization, repolarization)
- 4)
  - a) Atrial node
  - b) SA node
  - c) bundled his
  - d) ventricular wave
  - e) purkinjie fibers

KNOW WHAT EACH DOES!!

PNS vs. SNS heart rate up/down – use of various meds to control rate and rhythm

**H. Blood cell types and function**

- 1) RBC - trace origin (i.e. stem cells)
- 2) Platelets
- 3) WBC (various types)
- 4) Control of blood pressure – maintenance
- 5) Physiology of blood pressure – maintenance
- 6) Veins vs. arteries, structure & function
- 7) Process of clotting – various stages
- 8) Capillary permeability – control
- 9) Exercise – physiological response – (i.e. blood flow, heart rate, response)
- 10) Plasma proteins – what are they – what is their function
- 11) Function of lymph system
- 12) Erythropoeitin – production, where?

**I. Chest wall, Diaphragm, Pleura, Ribs, structure & function**

**J. Lungs: Structure & function**

- 1) Mechanics of Ventilation
- 2) Pulmonary Volumes and Capacities
- 3) Blood gases
  - a) PH, CO<sub>2</sub> transport, interaction of PO<sub>2</sub> and PCO<sub>2</sub>
  - b) C1
- 4) Hyper vs. hypoventilation – what happens to BG's?
- 5) Respiratory Regulation center – effect of high CO<sub>2</sub> + low O<sub>2</sub>
- 6) Anabolism vs. catabolism – def & functions; examples in body on cellular and organ and system level.

**K. Digestive System**

- 1) Structure and function of the whole system and the various organs.
- 2) Def. of endocrine vs. exocrine functions of the digestive organs in particular the:
  - a) salivary glands
  - b) stomach
  - c) gallbladder
  - d) pancreas
  - e) liver
- 3) Know the various digestive enzymes and what they breakdown (i.e. pepsin, catylase, etc.)

**L. The Endocrine System**

- 1) Hypothalamus
- 2) The pituitary gland
  - a) Ant vs.
  - b) Post
  - c) Hormone secretions
- 3) The Negative feedback system
- 4) The Hormones – their function, where produced & what they act on.

**M. The kidney – structure and function**

- 1) Functional unit
- 2) formation of urine
- 3) the constituents of urine
- 4) The GU system – anatomy & structure

**N. Male & Female reproductive anatomy structure**

- 1) Hormonal control, major players and structures
- 2) Ovulation and Menstruation
- 3) Conception and implantation
4. Stages of labor and involution

**O. Neurosystem**

- 1) Overall Structure & functional areas
  - a) Anatomical areas of Brain and Skull
  - b) Divisions: CNS (ANS and SNS): PNS (CNs and SNs)
  - c) Functional areas and divisions of Brain
  - d) Meninges and CSF formation and circulation
  - e) Neurons: structure, types, organelles
- 2) Structure and Function of Nerves and Nerve transmission
  - a) Reception and transmission of an impulse
  - b) Flight or Fight response – what happens? – the process
  - c) Reflex Arc
  - d) Neurotransmitters (Various types) and the Synaptic cleft:
  - e) Pathways: Sensory and Motor
  - f) Nodes and synaptic knobs/function of myelin

- 3) Nerve action potential
  - a) movement of ions? – which and what way  $\text{Na}^+/\text{K}^+/\text{Ca}^{++}$  pump
  - b) Norepinephrine, Acetylcholine, Cholinesterase, Function
- 4) Blood osmolarity – where detected
- 5) Ear – structure & function
  - a) Auditory branch
  - b) Vestibular branchEye – structure & function visual fields and neuronal pathways
- 6) Other Senses various receptors mainly in skin
  - a) chemo receptors
  - b) mecano receptors
  - c) Proprio/tactile receptors
  - d) Thermo receptors

**P. Immune System**

- 1) Structure & function
- 2) Components
  - a) T Cell development and function
  - b) B Cell development and function
- 3) Cellular vs. humoral immunity
- 4) Specific vs. Non-specific defense/Immunity
- 5) Inflammatory response
- 6) Structure and action of Antibodies
- 7) Complement fixation