## **CHAPTER 4 ANATOMY AND PHYSIOLOGY**

## **Knowledge review answers**

- It is essential for any treatment to be performed safely and effectively, that the therapist has at least a basic understanding of anatomy and physiology. An understanding of the systems of the body will also ensure enable you to understand the implications of why certain conditions are contra indicated.
- 2. The tissue fluid that bathes all the cells of the body must be kept at a fairly constant level to enable cells to function and survive. To achieve this balance the following must be kept in constant check:
  - removal of metabolites
  - removal of urea
  - balance of ions
  - water content
  - availability of oxygen and glucose
  - temperature
- 3. Epithelial, connective, muscular and nervous.
- 4. Functions of the skin:
  - Protection
  - Absorption
  - Sensory organ

- Temperature regulation
- Excretion
- Synthesis of vitamin D
- 5. Diseases/Disorders:
  - **Contagious:** Impetigo, herpes simplex, herpes zoster, warts, verrucae, tinea (corporis & Pedis), scabies.
  - Non-contagious: Moles, nevus, bruises, eczema, dermatitis, psoriasis, sunburn, hives, uticaria, acne vulgaris, (active) acne rosacea (active, acute).

6.

		Veins	
Arteries			
•	Carries blood away from the heart (with the exception of the pulmonary artery) Carries oxygenated blood (with the exception of the pulmonary artery) Blood pumps under pressure	•	Transport blood back to the heart (Exception of the pulmonary vein Carries deoxygenated blood (exception of the pulmonary vein)
•	Vessels have thick walls	•	Contain valves to maintain direction of blood flow Vessels have thin walls

## 7. Cells found in blood:

- Erythrocytes Red Blood Cells
- Plasma
- White Corpuscles Leukocytes Granulocytes: (Eosinophils, Basophils,

Neutrophils) Agranulocytes: (Monocytes, Lymphocytes)

- Thrombocytes or Platelets
- 8.

Blood circulation	Lymph circulation
Blood vessels continuous	Vessels blind ended
• Some vessels under high	• no red blood vessels
pressure	• like veins relies on muscular
• Fast moving -	activity to squeeze blood
	through the vessels
	Slow moving fluid
	• System one way

## 9. Functions **of the skeleton:**

- support
- attachment
- protection
- development of blood cells
- calcium Reservoir
- 10. Functions of the muscular system:
  - movement
  - maintenance of posture
  - heat production
  - assist in venous return, and lymph circulation
  - some protection of abdominal organs

- 11. 3 types of muscular tissue:
  - skeletal, striated or voluntary muscle: under conscious control
  - cardiac muscle: found exclusively in the heart
  - smooth or involuntary muscle: not under conscious control.

12.





Major muscles (posterior view)

- **13.** Air rich in oxygen is taken in through the nose and mouth down the trachea and bronchial tubes to the alveoli in the lungs. Here it diffuses through a thin film of moisture lining the alveoli. The oxygen molecules come into close contact with the blood in the capillary network surrounding the alveoli and diffuses across a permeable membrane wall surrounding the alveoli to be taken up by red blood cells and carried to the heart. Carbon dioxide, collected from the respiring cells around the body passes in the opposite direction by diffusing from the capillary walls into the alveoli> It passes through to the bronchi, trachea and is eventually exhaled through the nose and mouth.
- 14. Functions of the liver:
  - regulation of blood sugar levels
  - regulation of fat metabolism
  - vitamin storage
  - mineral storage
  - protein metabolism
  - bile production:
  - regulation of toxic substances
  - breakdown unwanted hormones
  - excretory function breaks down old red blood cells.
  - heat production

- 15. Nervous system:
  - The **central nervous system** consisting of the brain and the spinal cord.
  - The **peripheral nervous system**, all the nervous system outside of brain or spinal cord.
- 16. An odour comes from particles of gas or vapour. They are not smelt unless the smell bearing molecules come in contact with the sensitive surface of the inner nose. There are two receptor sites about the size of a postage stamp in an exposed cavity located behind the eye sockets at the roof of the nasal cavity. Each site is covered with a membrane with yellowy brown mucus called olfactory epithelium. The membrane is also covered with millions of hair like projections, which extend through the mucus and make contact with the air as it passes through to the throat and lungs. Odour molecules dissolve into the mucus. Fibres from these cells link up with olfactory areas in the brain. Different odour molecules are like keys and for a smell to register with the brain it must fit into the right lock or receptor. Once the receptor is activated the signal is conducted to the brain via the olfactory bulb. From here the odour passes to the olfactory stalk, to the limbic system.

1. Pituitary	Growth Hormone
	Prolactin
	Oxytocin
	Thyroid stimulating
	Hormone (TSH)
	Anti diuretic hormone
2. Thyroid	Thyroxin
3. The Parathyroid	Parathormone,
4. The Thymus	Thymosin
5. Adrenals	Adrenalin (from medulla)
	Cortico steroids
	( from cortex)
	a. Cortisol
	b. Aldosterone
	c. Androgens
6. Pancreas	Insulin
(islets of Langerhans)	Glucagon
7. Ovaries	Oestrogen
	Progesterone
8. Testes	Testosterone
	Androgen

17.

- The main function of the renal system is to regulate the volume of body fluids and its composition.
- 19. The amount of fluid taken into the body (mainly through digestion) must equal the amount of fluid excreted from it, (faeces, urine, sweat, moisture in exhaled breath). This is necessary for the body to maintain a constant internal environment.

The main life changes in a female: menopause, puberty and pregnancy.

- 20. Considerations:
  - Whether the treatment is suitable at all
  - How pregnant the client is
  - Whether there has been a history of miscarriage or fertility problems
  - General state of health