Integumentary system essay - functions and maintenance

The integumentary system is made up of skin, hair, nails, and glands. It is the most visible organ system and one of the most complex. The integumentary system protects the body from the outside world and harmful substances. The word integument means a covering, and the skin of an organ, an average adult covers well over 3000 square inches of surface area of the body. The skin weighs about six pounds which is nearly twice the weight of the brain or liver. It receives approximately one third of all the blood circulating through the body. It participates in the dissipation of water through sweating and helps regulate our body temperatures.

The functions of the integumentary system are sensation, protection, thermoregulation, and secretion. In sensation receptor sites in the skin detect changes in the eternal environment for temperature and pressure. Temperature receptors produce the sensations of hot and cold. Pressure receptor sites allow us to interpret excessive pressure that results in the sensation of pain when we get pinched. Protection of the skin is an elastic resistant covering. It prevents passage of harmful physical and chemical agents. The melanin produced by the melanocytes in the stratum germinatium protects us from the damaging ultraviolet rays of sunlight. Keratin, in abundance in this outer layer, waterproofs the body. Without it handling household chemicals, swimming in pool, or taking a shower would be disastrous to the underlying cells of the body.

Excessive evaporation or loss of body fluids would result in dehydration and eventual death. Sebum serves a further protective function by keeping the skin and hair moist; dry skin would crack, allowing viruses and bacteria to enter. Even though the skin forms a protective barrier, it is still slightly

permeable or allow certain substances to pass through it. Vitamins A, D, E, and K all pass through the skin and are absorbed in the capillaries of the dermis. Nails protect the exposed tips of fingers and toes from physical injury. Fingernails also, aid the fingers in picking up small objects. The hair protects the scalp from damaging ultraviolet radiation from the skin, cushions the head from physical blows and insulates the scalp to a degree. The protection afforded by melanin, however, is limited. Prolonged or excessive exposure to UV radiation eventually damages the skin. In thermoregulation the normal body temperature is maintained at approximately 98. 6 F (37C). The heat regulating functions of the body are extremely important. If the internal temperature varies more than a few degrees from normal, life- threatening changes take place in the body. Temperature regulation is critical to our survival because changes in temperature affect the functioning of enzymes. When people get high fevers they can die because the heat of a fever destroys the enzymes by breaking up their chemical structure. Without enzymes, chemical reactions cannot occur, and our cellular machinery breaks down and death results. When external temperatures increase, blood vessels in the dermis dilate to bring more blood flow to the surface of the body from deeper tissue beneath.

Eccrine glands play an important part in maintaining normal body temperature. When the temperature of the body rises due to physical exercise or environmental conditions, the hypothalamus sends signals to the eccrine glands to secrete sweat. When sweat evaporates on the skin surface it carries large amount of body heat with it and the skin surface cools. Because blood carries heat, blood flow is another regulator of body

temperature. In secretion the skin produces two secretions: sebum and sweat. Sebum is secreted by the sebaceous glands. It helps prevent infection and maintains the texture and integrity of the skin. Sweat is produced by the sweat glands and is essential in the cooling process of the body. The skin is actively involved in the production of vitamin D. Vitamin D is necessary for our bodies because it stimulates the intake of calcium and phosphate in our intestines. Calcium is necessary for muscle contraction and bone development. Phosphorus is an essential part of adenosine triphosphate. The integumentary system is essential to the body’s homeostasis or ability to maintain the internal balance of its functions regardless of outside conditions.

The skin is the largest and heaviest in the body. In an average adult, the skin covers about 21. 5 square feet and accounts for approximately seven percent of body weight, or about eleven pounds. The skin has two principal layers: the epidermis and the dermis. The epidermis is the thin, outer layer, and the dermis is the thick, inner layer. Beneath the dermis lies the subcutaneous layer or hypodermis, which is composed of adipose or fatty tissue. Although, not technically part of the skin, it does anchor the skin to the underlying muscles. The epidermis is made of stratified squamous epithelial tissue. Squamous cells are thin and flat like fish scales. Stratified simply means having two or more layers. The epidermis can be divided into four or five layers. Most important of these are the inner and outer layers. The inner or deepest cell layer is the only layer of the epidermis that receives nutrients. The cells of this layer called basal cells, are constantly dividing and creating new cells daily, which push the older cells toward the

surface. Basal cells produce keratin, an extremely durable and water-resistant fibrous protein. Another type of cell found in the lower dermis is the melanocyte. Melanocytes produce melanin, a protein pigment that ranges in color from yellow to brown to black. The dermis, the second layer of skin lies between the epidermis and the subcutaneous layer. Hair, sweat glands, and sebaceous glands are all rooted in the dermis. Connective tissue forms the dermis. Bundles of elastic, and collagen fibrous blend into the connective tissue. These fibers provide the dermis strength and flexibility.

The accessory structures of the integumentary system include hair, sweat and sebaceous glands. Epithelial membranes are composed of epithelial tissue and an underlying layer of specialized connective tissue. Roughly five million hairs cover the body of an average individual. About 100, 000 of those hairs appear on the scalp. Hair shafts differ in size, shape, and color. Each individual hair is composed of three parts: the cuticle, the cortex, and the medulla. The outermost portion is the cuticle, which consists of several layers of overlapping scale like cells. The cortex is the principle portion of the hair. The middle or central part of the hair is called the medulla. The shaft is the visible portion of the hair. The shaft is the visible portion of the hair. The root is found in an epidermal tube called the hair follicle. The follicle is made up of an outer connective tissue sheath and an inner epithelial membrane continuous with the stratum germinatium. Nails are produced by nail follicles just as hair produced by hair follicles. Health fingernails grow about 0. 04 inches per week, slightly faster than toenails. There are more than 2. 5 million sweat glands and distributed over most surfaces of the human body. They are divided into two types: eccrine sweat glands and apocrine sweat

glands. Eccrine glands produce sweat or perspiration, a clear secretion that is 99 percent water. An average individual losses 0. 6 to 1. 7 quarts of water every day through sweating. During rigorous physical activity or on a hot day, that amount could rise to 5. 3 to 7. 4 quarts. Apocrine glands are found in the armpits, around the nipples, and in the groin. Appocrine glands do not function until puberty. Sebaceous glands, also known as oil glands, are found in the dermis all over the body, except for the palms and soles. They secrete sebum, a mixture of lipids, proteins, and fragments of dead fat producing cells. Chemistry is important to the healing of burns and the froming of melanin and melanocytes. Melanin produces pigment and melanocytes are responsible for producing skin color.

The three types of membranes are cutaneous, serous, and mucous. The cutaneous membrane is the primary organ of the integumentary system. It is one of the most important and certainly one of the largest and most visible organs. In most individuals the skin composes some sixteen percent of the body weight. The serous membrane is composed of two distinct layers of tissue. Serous membrane secrete a thin, watery fluid that helps reduce friction and serves as a lubricant when organs rules against one another, and against the walls of the cavities that contain them. Mucous membranes are epithelial membranes that line body surfaces opening directly to the exterior.

There are three types of burns, first degree, second degree and third degree burns. Burns are injuries to tissues caused by intense heat, electricity, UV, radiation, or certain chemicals. When skin is burned and cells are destroyed, the body readily loses its precious supply of fluids. Dehydration can follow,

leading to a shutdown of the kidneys, a life threatening condition. Infection is the leading cause of death in burn victims. First- degree burns occur when only the epidermis is damaged. Sunburns are usually first- degree burns. These minor burns are usually not serious and heal within a few days. Second- degree burns occur when the epidermis and the upper region of the dermis are damaged. In second- degree burns blisters may form and take longer to heal. In third- degree burns the skins is destroyed. Often skin grafting is necessary for third- degree burns. Third- degree burns take weeks to heal and will leave permanent scarring.

In the current research on anti- aging treatments is on anti- aging. Research has taught us that by using components that are already found in the skin can help restore youth. We have yet to see the long term effects of some anti- aging products such as Botox and Restylane. In certain treatments can help to restore the skin of anti- aging. Botox is injected into the skin to treat severe underarm sweating. When medicines used on the skin do not work well enough. Restylane use hyaluronic acid to replace lost volumes and restore youthful skin contains to smooth away, moderate to severe facial wrinkles, and folds such as the lines from your nose to the corners of your mouth.