

---

# **IQRA NATIONAL UNIVERSITY**

## **DEPARTMENT OF ALLIED HEALTH SCIENCES**

**Final-Term Examination 2020**

Course Title: microbiology and pathology DPT 4<sup>th</sup>

Instructor: Dr. Imran khan

Time: 6 hours

Total Marks: 50

---

**Name: Brekhna Malik**

**ID : 14508**

**Q1. What do you know about healing and repair. Explain?**

**Ans) Healing & Repair;**

Healing is process of restoring injury to normal structure and function. It usually consist of two process tissue regeneration and fibrous organization.

- **Regeneration;** Growth of cells and tissues to replace lost structures (with restoration of normal architecture)
- **Organisation/Fibrous Repair;** Conversion of an inflammatory exudate into a fibrous scar. also called healing by fibrous repair by haemostasis, inflammation, granulation tissue.
- **Resolution;** Complete disappearance of an inflammatory exudate.
- **Granulation tissue;** Newly formed small blood vessels and fibroblasts, occurring in the early phase of repair 24-72h there is often accompanying oedema. Gross appearance pink soft granular on the wound surface.

---

**Phases of Wound Healing;** The wound healing stages are made up of three basic phases: inflammation, proliferation, and maturation.

**1: Inflammation:** The first phase of healing is inflammation the body's natural response to trauma After the wound has been inflicted , homeostasis begins the blood vessels constrict and seal themselves off as platelets create a substance that form a clot and halt bleeding. Once homeostasis is achieved the blood vessels dilate, Letting nutrients, white blood cells, antibodies, enzymes, and other beneficial elements into the effected area to promote good wound healing and stave off infection.

**2: Proliferation:** In the second wound healing stages, Proliferation, the wound begins to be rebuilt with new healthy granulation tissue. To be formed the blood vessels must receive a sufficient supply of nutrients and oxygen the new tissue is made up of mixture of extracellular matrix and collagen which allow for the development of new network of blood vessels to replace the damage once a process called angiogenesis according to the AWMA the color of the granulation tissue is an indicator of the health of the wound for example a reddish or pinkish color generally means that it is healthy while darker tissues often an indicator of infection.

**3: Maturation:** Maturation also known as remodeling is the last stage of the wound healing process. It occurs after the wound has closed up and can take as long as two years. During this phase the dermal tissue are overhauled to enhance their tensile strength and non functional ones. Cellular activity decline with time and the number of blood vessels in effected area decrease and recede.

---

**Key Players;** Cell macrophages, lymphocytes, platelets, endothelial cell, fibroblasts.

**Q2. What are hemodynamic disorders? Explain any 3 ?**

**Ans)** To maintain the correct amount of intravascular and extravascular volumes, the body must maintain both hydrostatic pressure and osmotic pressure. In vessels, hydrostatic pressure refers to the pressure pushing fluid out into the interstitial tissue. In interstitial tissue, hydrostatic pressure pushes fluid into the vessels. Osmotic pressure, which is imparted by the presence of dissolved solutes, pulls fluid into the vessels and into the interstitial tissue. An imbalance in either of these two pressures results in an abnormal distribution of fluid in the cells or interstitial tissues. The term used to describe excessive amounts of fluid within the interstitial tissues or within cells is edema.

The integrity of vessel walls plays a critical role in maintaining normal distribution of fluid in the vessels and interstitial tissues. The process of coagulation serves to maintain the integrity of the vasculature in the event of disruption of the vascular wall. Inappropriate coagulation can have deleterious consequences, however. For example, abnormal coagulation can result in vessel occlusion; thus the process must be closely controlled. An adequate supply of blood to the tissues is vital because it provides oxygen and nutrients to the cells and removes toxic metabolites from the cells. An inadequate amount of blood flow to an organ is termed ischemia. Ischemia is an important cause of cellular dysfunction and, if severe, often leads to cell death. The resultant area of necrotic cells is termed an infarct. In addition to localized ischemia due

---

to occlusion of blood vessels, a more generalized ischemia can occur due to widespread hypoperfusion of the body. This generalized hypoperfusion of the organs and resultant organ damage is called shock. Shock can result from a decreased amount of blood (i.e., hypovolemic shock), failure of the heart to effectively pump the blood (i.e., cardiogenic shock), or generalized dilation of the vasculature system secondary to infection (i.e., septic shock). This chapter will discuss edema, hyperemia and congestion, hemorrhage, thrombi, emboli, infarcts, and shock.

**1: Edema;** increased fluid in the interstitial tissue spaces.

### **Cause of Edema;**

- **Increased Hydrostatic pressure;** impaired venous return
- **Reduced plasma osmotic pressure;** liver, cirrhosis, nephrotic syndrome.
- **Lymphatic obstruction;** Neoplastic or postsurgical
- **Sodium Retention;** Excessive salt intake with renal insufficiency
- **Inflammation;** Acute inflammation, chronic inflammation.

### **Types of Edema:**

1. **Anasarca;** Generalized edema
2. **Dependent edema;** prominent feature of congestive heart failure, particularly of the right ventricle.
3. **Renal edema;** Edema as a result of renal dysfunction r nephrotic syndrome is generally more severe than cardiac edema and effects all part of the body equally.
4. **Pre orbital edema;** Severe renal disease

---

5. **Pitting edema**; Fingre pressure over substantially edematous subcutaneous tissue displace the interstitial fluid and leaves a finger shaped depression.

## **2: Hyperemia & Congestion;**

Both indicate a local increase volume of blood in a particular tissue.

In both cases there is an increased volume and pressure of blood in a given tissue with associated capillary dilation and potential for fluid extravasation in hyperema increased flow leads to engorgement with oxygenated blood resulting erythema.

**3; Hemorrhage:** Extravasation of blood due to vessel rupture

### **Types;**

- **Hematoma:** Accumulation of blood with in tissues
- **Petechiae:** minutes 1 to 2mm Hemorrhage into skin, mucous membrane, or serosal surfaces.
- **Purpura:** Slightly larger 3mm Hemorrhage.
- **Ecchymoses:** larger 1 to 2 cm subcutaneous hematomas
- **Hemothorax, hemopericardium, hemoperitoneum or hemarthroses in joints:** Larger accumulated of blood in of the body cavities.

### **Q3. What is renewal and regeneration?**

**Ans) Healing** Word healing is used in a pathological context refers to the body replacement of destroyed tissue by living tissue.

---

**Regeneration;** The replacements of lost damage tissue by tissue of similar in type.

Occure only in tissues with regenerative activity.

**Repair:** A process in which lost tissue replace by fibrous tissue or scare.

Eg Healed myocardial infarction.

**Cell proliferation:**

An increase in the number of cell as a result of cell growth and cell division.

**Control of normal cell Proliferation:**

- In adult tissues the size of cell population is determined
- The rate of cell proliferation
- Differentiation and death by apoptosis.

**Tissue Proliferation activity:**

According to regenerative capacity of the cell the tissue of the body can divided into 3 groups.

- Continuously dividing tissue.
- Qulesent
- Non dividing.

**1: Continuously Dividing Tissue:**

These cells proliferation through out life, replacing those that are destroyed.

---

Stratified squamous epithelia of the skin, oral cavity, vagina, and cervix the lining mucosa of all the excretory duct of gland of the body salivary gland, pancreas, biliary tract.

## **2: Quiescent Tissues;**

Normally have a low level of replication however cell from these tissue can undergo rapid division in response of stimuli

This capable of reconstituting tissue origin.

Eg parenchymal cells of liver, kidney, pancreas.

## **3: Permanent Tissue:**

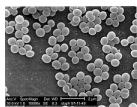
These are non dividing cells. If lost permanent cell cannot be replaced because they don't have the capacity to proliferate. For example adult neuron striated muscle cell and cell of the lens.

## **Q4. Write detailed note on staphylococcus and streptococcus?**

### **Ans) Staphylococcus;**

Staphylococcus is a genus of Gram-positive bacteria in the family Staphylococcaceae from the order Bacillales. Under the microscope, they appear spherical (cocci), and form in grape-like clusters.

Staphylococcus species are facultative anaerobic organisms (capable of growth both aerobically and anaerobically).



---

Staphylococcus can cause a wide variety of diseases in humans and animals through either toxin production or penetration. Staphylococcal toxins are a common cause of food poisoning, for they can be produced by bacteria growing in improperly stored food items. The most common sialadenitis is caused by staphylococci, as bacterial infections.

### **Clinical Manifestations**

Staphylococci can cause many forms of infection.

**(1)** Staphylococcus causes superficial skin lesions (boils, styes) and localized abscesses in other sites.

**(2)** S aureus causes deep-seated infections, such as osteomyelitis and endocarditis and more serious skin infections (furunculosis).

**(3)** S aureus is a major cause of hospital acquired (nosocomial) infection of surgical wounds and, with S epidermidis, causes infections associated with indwelling medical devices.

**(4)** S aureus causes food poisoning by releasing enterotoxins into food.

**(5)** S aureus causes toxic shock syndrome by release of superantigens into the blood stream.

**(6)** S saprophiticus causes urinary tract infections, especially in girls.

**(7)** Other species of staphylococci (S lugdunensis, S haemolyticus, S warneri, S schleiferi, S intermedius) are infrequent pathogens.

### **Treatment**



---

Infections acquired outside hospitals can usually be treated with penicillinase-resistant  $\beta$ -lactams. Hospital acquired infection is often caused by antibiotic resistant strains and can only be treated with vancomycin.

## **2; Streptococcus;**

Streptococci are Gram-positive, nonmotile, nonsporeforming, catalase-negative cocci that occur in pairs or chains. Older cultures may lose their Gram-positive character. Most streptococci are facultative anaerobes, and some are obligate (strict) anaerobes. Most require enriched media (blood agar). Group A streptococci have a hyaluronic acid capsule.

### **Classification and Antigenic Types;**

Streptococci are classified on the basis of colony morphology, hemolysis, biochemical reactions, and (most definitively) serologic specificity. They are divided into three groups by the type of hemolysis on blood agar:  $\beta$ -hemolytic (clear, complete lysis of red cells),  $\alpha$  hemolytic (incomplete, green hemolysis), and  $\gamma$  hemolytic (no hemolysis). Serologic grouping is based on antigenic differences in cell wall carbohydrates (groups A to V), in cell wall pili-associated protein, and in the polysaccharide capsule in group B streptococci.

### **Disorders;**

cause many disorders, including pharyngitis, pneumonia, wound and skin infections, sepsis, and endocarditis. Symptoms vary with the organ infected. Sequelae of infections due to group A beta-hemolytic streptococci may include rheumatic fever and glomerulonephritis. Most

---

strains are sensitive to penicillin, but macrolide-resistant strains have recently emerged.