SAQ and Answers ~ S4 T1 ~ 2023

Respiratory system

1. Outline characteristics of pulmonary circulation ?

Ans/

1- low resistance

2- low pressure

3- receives entire cardiac output

2. Define main respiratory disease signs and symptoms

Ans/

Shortness of Breath (Dyspnoea) , Chest pain , Cough , Wheeze ,

Sputum production , Haemoptysis

3. What is cardiac index ?

Ans /

The widest part of the heart and ribcage are measured laterally. If the heart is over 50% of the width of the thorax, it is enlarged.

4. Describe the asthma in children and their characteristics?

Ans/

Asthma is a chronic inflammatory disorder of the airways, characterized by (chronic inflammatory process ,susceptibility ,variable airflow obstruction ,airway hyper responsiveness,reversibility %15 spontaneously or with bronchodilator or steroids)

5. Define aspiration pneumonia

Ans /

Aspiration of food, drink, saliva or vomitus can lead to pneumonia. This is more likely in individuals whose level of consciousness is altered, due to anaesthesia, alcohol or drug abuse or have swallowing related problems due to neuromuscular problems or esophageal disease.

Causative organisms include oral flora & anaerobes

6. Define tidal volume

Ans/

The lung volume that represents the amount of air that is displaced between normal inspiration and expiration, when extra effort is not applied

7. Classify the thoracic ribs ?

Ans/

3 types of ribs classified:

1-True ribs (1st-7th ribs)

Attach directly to the sternum via their own coastal cartilages

2-False ribs (8th - 10th ribs)

Attache to the cartilage of the rib above them, indirectly attach lo stemum

3-Floating ribs (11th -12th ribs)

Not connect to the sternum, directly or indirectly

8. Describe Parts of the sternum?

Ans/

•The sternum consists of three parts

1- The manubrium - which articulates with the 1st and part of the 2nd costal cartilage

2-The body - which articulates with part of the 2nd and the 3rd -7th costal cartilages

3- The xiphisternum , which remains cartilaginous into adult life

9. Define natural defenses of the respiratory tract against infection?

Ans/

1- Cough and sneezing reflex

2- Muco- ciliary clearance mechanisms

3- Ciliated columnar epithelium

4- Nasal hairs

5-Respiratory mucosal immune system

6- Lymphoid follicles of the pharynx and tonsils

7- Alveolar macrophages

8- Secretary IgA and IgG

10. describe mechanism Gasses dissolving in water?

Ans/

-Gas molecules enter water

- exert 'tension'

- like pressure if water not there

- At equilibrium tension same as partial pressure of gas in gas mixture

11. describes Hypoxia and types.

Ans/

~Hypoxia: decrease oxygen level in tissues

~Types:

1- Hypoxemic Hypoxia: decreased breathable O2

2- Anemic Hypoxia: decreased functional Hb

3- Stagnant Hypoxia: decreased blood flow- HF

4- Histotoxic Hypoxia: unable to make proper use of O2

12. What is BCG vaccination?

Ans/

The BCG vaccine is a vaccination against tuberculosis that is prepared from a strain of the Attenuated Live Bovine Tuberculosis Bacillus.

The bacteria retain a strong enough antigenicity to act as a vaccine for human tuberculosis.

Urinary System

1. Explain stage of chronic kidney disease

Ans/

Stage 1 : Kidney damage with normal kidney function , GFR (90 or higher)

Stage 2 : Kidney damage with mild loss of kidney function , GFR (60-89)

Stage 3 : Moderate loss of kidney function , GFR (30-59)

Stage 4 : Severe loss of kidney function , GFR (15-29)

Stage 5 : Kidney failure , GFR(less than 15)

2. Mechanism action of loop diuretics

Ans/

1- Block the type 2 Na K 2Cl (NKCC2) co-transporter in the thick ascending limb of the loop of Henle

2- Tubuloglomerular feedback would normally act to compensate by a decrease in GER,but this is dependent on identical (inhibited) co-transporter in macula densa.

3- May cause hypokalaemic metabolic alkalosis

4- Initial Na and volume loss may be compensated for by Na retention

3. Write briefly about the risk factor of calcium based stone ?

Ans/

1- Excessive excretion of {calcium (hypercalciuria), oxalate (hyperoxaluria), or uric acid (hyperuricosuria)}. Uric acid crystals often form the nidus that progresses to a calcium-based stone.

2- Factors that cause insolubility, e.g. insufficient citrate excretion (hypocitraturia). Citrate forms a soluble complex with calcium.

3- Low-volume, or concentrated, urine.

4- Abnormal urinary tract, e.g. medullary sponge kidney.

5- Renal tubular acidosis.

4. Mention the blood supply for bladder

Ans/

Arterial: The bladder is supplied by the (superior, middle, and inferior vesical arteries) ->which arise from the anterior trunk of the internal iliac hypogastric artery And by (smaller branches from the obtulator and infefior gluteal arteries).

In females, uterine and vaginal arteries also send branches to the bladder.

5. Write about risk factor chronic kidney disease (failure) ?

Ans/

1- Diabetes

2- High blood pressure

3- family history of kidney failure heBeing age 60 or older

5- African American, Hispanic, Asian, Pacific Islander, or American Indian

6- Obesity

6. Enumerate type of urinary incontinence?

Ans /

1- Stress urinary incontinence

2- Urge urinary incontinence

3- Mixed urinary incontinence

4- Overflow incontinence

5- Nocturnal enuresis

6- Post- micturition dribble

7- Continuous incontinence

8- Insensible incontinence

7. What is CKD?

Ans/

Chronic kidney failure/disease is a progressive and irreversible loss of renal function or GFR decrease for at least 3 or more months.

Functioning renal tissue is replaced by an extracellular matrix in response to tissue damage , As a result, there is a progressive loss of the excretory and metabolic and endocrine functions of the kidney.

8. Define uses of ultrasound

Ans/

1- Can determine the presence/ absence of hydronephrosis (dilatation of the collecting system).

2- Determination of the nature of renal masses, US can differentiate simple cysts from solid masses

3- Evaluation of renal stone, which can be characterized by casting an „acoustic shadow".

4- Assessment of haematuria.

5- Allows ultrasound- guided intervention, for example nephrostomy insertion in patients with hydronephrosis and renal impairment or with infected, obstructed kidneys.

6. Evaluation of urinary retention and measurement of post- void residual (PVR) urine volume.

9. Enumerate main causes of Hyperkalemia?

1- CKD (chronic kidney disease)

2- K+ - rich diets (bananas, other fruits) with CKD.

3- Drug - induced (esp. combinations of the following) , example :

ACE inhibitors/ARB , K+ - sparing diuretics (spironolactone) , NSAIDs,B -blockers.

4- Hypoaldosteronism (including type 4 RTA).

5- Addison disease.

6- Increased release from cells:

7- Lactic acidosis.

8- Insulin deficiency (DKA).

10. indications for checking serum PSA ?

Ans/

• Patient request, following counselling

• LUTS.

• Abnormal DRE.

• Progressive bone pain, especially back pain.

• Unexplained anaemia, anorexia, or weight loss.

• Spontaneous thromboembolism or unilateral leg swelling.

• Monitoring of prostate cancer patients.

11. describe advantage and disadvantage haemodialysis

Ans/

~ Advantages :

1- Effective (Survivors > 25 years)

2- 4/7 days free from treatment

3- Dialysis dose easily prescribed

~ Disadvantages :

1- Fluid/Diet restrictions

2- Limits holidays

3- Access problems

4- CVS instability

5- High capital cost

12. Role of kidney in acid base balance by preventing bicarbonate loss?

Ans/

Preventing bicarbonate loss: 80- 90% of filtered HCO_3^- is actively reabsorbed in the proximal tubule:

~ Proximal tubular cell Na^+ is pumped into the interstitium, creating an inward gradient causes Na^+ movement from the lumen to the PCT cells then transported with HCO_3^- to the interstitium.

~ In the lumen, H^+ bind to HCO_3^- to form H_2CO_3 (carbonic acid).

~ Luminal carbonic anhydrase then enhance CO_2 and H_2O taken up into cells.

~ Intracellular carbonic anhydrase then increases H^+ and HCO_3^-

~ Intracellular HCO_3^- is then transported into the peritubular capillaries.

~ The remaining H^+ is available for recycling

13. Use of CT scan in urinary tract

Ans/

Uses of both CT-KUB and CT-urography:

1- Investigation of renal and ureteric stone, Assessment of stone size, location and stone density.

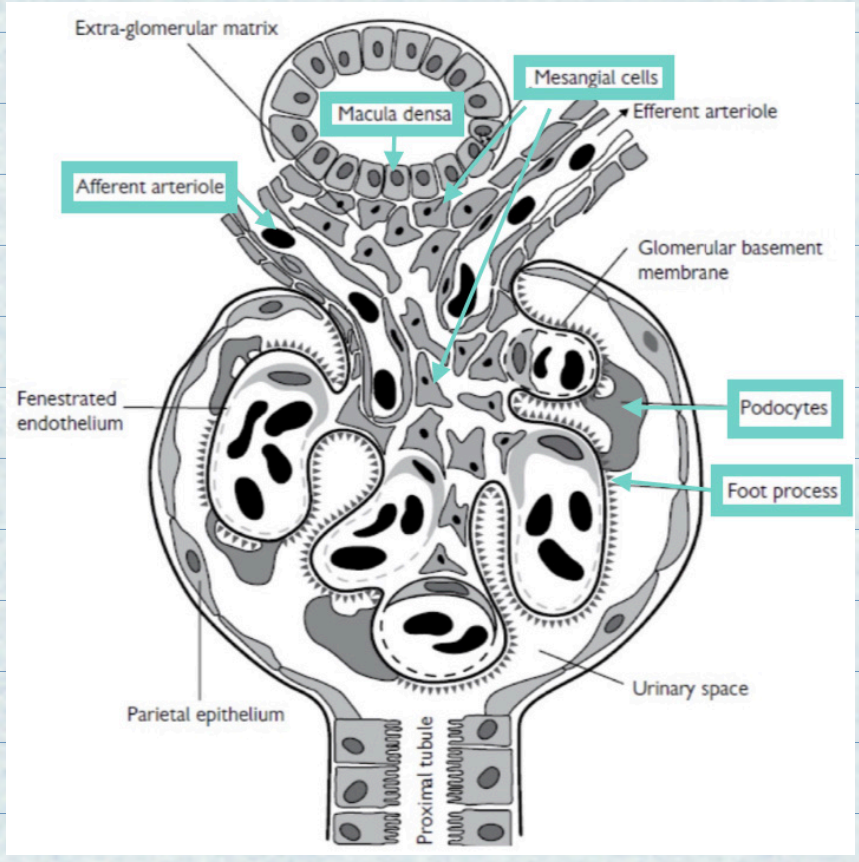
2- Investigation of renal and ureteric tumors, differentiating between malignant and benign renal masses.

3- Detection and localization of the site of intrarenal and perirenal collections of pus.

4- Staging (grading) of renal injury.

5- Investigation and staging of bladder tumors.

14. Law rsmay xwarawa aw shtanay xstumata lakeshakan ka dyarim krdun awan labrabun u daiwt chn



Gastrointestinal system

1. Difference between omphalocele and gastroschisis?

Ans/

Features	Omphalocele	Gastroschisis
1 Site of the defect	Central umbilical	Right paraumbilical
2 Sac	Always present	Never present
3 Anomalies of rotation and fixation	Present	Present
4 Gender	More frequent in females	Equal
5 Associated anomalies	Frequent (heart anomalies)	Rare
6 Intestinal atresia	Rare	Up to 10%

2. Stages of swallowing?

Ans/ Swallowing (deglutition) process of 2 stages:

1- Voluntary stage: squeezing the food & rolling it posteriorly into the pharynx by tongue pressure upward & backward against the palate.

2- Automatic (involuntary) stage : It is automatic & can not be stopped voluntarily. Consist of 2 stages: Pharyngeal stage esophageal stage

3. Write short note about salivary secretion regulation

Ans/

~Salivary secretion regulated only by nervous mechanism.

~Salivary glands are supplied by both parasympathetic & sympathetic divisions of autonomic nervous system.

~Stimulation of sympathetic fibers causes secretion of saliva, which is thick and rich in organic constituents such as mucus, because these fibers activate the acinar cells & cause vasoconstriction.

~parasympathetic fibers Stimulation causes secretion of saliva with large quantity of water.

~parasympathetic fibers activate the acinar cells & dilate the blood vessels of salivary glands.

4. enumerate parts of midgut

Ans/

Small intestine {including duodenum (distal to the opening of the bile duct)} ,Caecum, appendix, ascending colon, and the right 2/3 of transverse colon

5. Stages in the Development of the Oesophagus?

Ans/

1- Elongation occurs during the 2nd month; by the 8th week the proliferating epithelium has partly occluded the lumen.

2- Recanalization occurs during the 3rd month by vacuolation in the multilayered columnar epithelium.

3- Differentiation of stratified squamous epithelium occurs during the 4th month.

4- Induction of muscle formation in the splanchnic mesoderm occurs during 2nd month in response to signals from the endoderm.Initially only smooth muscle forms.

5- Trans differentiation of smooth to skeletalmuscle occurs in the upper two-thirds of the esophagus

6. Write blood supply to the stomach?

Ans/ Right gastric artery , left gastric artery , short gastric artery , right & left gastroepiploic artery.

7. Extra-intestinal manifestation of IBD?

Ans/

~It may precede GI symptoms. The most common: Oral aphthous ulcers, arthralgia, back pain (ankylosing spondylitis or sacroilitis).

~Eye symptoms: (redness, pain, swelling) may be due to uveitis, scleritis, or other causes of ocular inflammation & warrant immediate examination by an ophthalmologist.

~Skin manifestations: are common include pyoderma gangrenosum & erythema nodosum.

~Liver involvement: most commonly; primary sclerosing cholangitis.

8. The areas of liver which are not covered by the peritoneum?

Ans/

1- Bare area of the liver: It is a triangular area on the posterior aspect of the right lobe (It is in direct contact with the diaphragm).

2- Fossa for gallbladder, on the inferior surface of the liver between right and quadrate lobes.

3- Groove for IC, on the posterior surface of the right lobe of the liver.

4- Groove for ligamentum venosum.

5- Porta hepatis.

9. Walls of the Inguinal Canal?

Ans/

~Anterior wall: External oblique aponeurosis.

~Posterior wall: Conjoint tendon medially, fascia transversalis laterally.

~Roof or superior wall: Arching lowest fibers of the internal oblique and transversus abdominis muscles

~Floor or inferior wall: Upturned lower edge of the inguinal ligament and, at its medial end, the lacunar ligament

10. Complications of peptic ulcer disease?

Ans/

1- Bleeding

2- Perforation of ulcer

3- Pyloric Obstruction

4- Penetration

11. Function of ileocecal valve?

Ans/

1- Prevents the backflow of cecal or colonic contents into the SI

2- Resists a back pressure of 60 cm Water.

3- Allows the emptying of ileal contents into the cecum after the gastro-ileal reflex

12. Function of the large intestine?

Ans/

1- Reabsorption of water and electrolytes, and compaction of the intestinal contents into feces.

2- Absorption of important vitamins produced by bacterial action.

3- Storing of fecal material before defecation.

Psychology

1. Identify appropriate strategies to promote behavior change for patients with dependence issues?

Ans/

1- Information (health education, health promotion)

2- Behavioral skills and resources (e.g. smoking cessation program , exercise advice)

3-Incentives to change (e.g. financial incentives)

2. Discus how biological, physiological and Social factors affect the experience of pain?

Ans/

The biopsychosocial model of pain dominates the scientific community's understanding of chronic pain. Indeed, the biopsychosocial approach describes pain and disability as a multidimensional, dynamic integration among physiological, psychological, and social factors that reciprocally influence one another.

3. Describe and evaluate psychological theories of health-related behaviour

Ans/

1-Learning theories

-> Classical conditioning +Operant conditioning + Social learning theories

2- Social learning theory

-> Health belief models + Theory of planned behaviour

3- Stages of change / trans theoretical model

4. Consider some of the criticisms of Piaget's theory, and it's alternatives

Ans/

~Criticism:

1- Tends to focus what child can not do, not what they can achive,

2- Parital information can be damaging

3- No Point trying to inform them

~Alternatives :

1- Carey : child an adult shares common journey from novice to expert

2-Vygotsky: child as an apprentice, Compromise between Piagetian view and Carey

5. Outline approaches for managing stress

Ans/

Perceived control , coping styles, coping strategies, Social support .

6. Describe approaches to managing chronic pain ?

Ans/

Central message is that the programme is about helping the patient take control of their pain, rather than the pain being in control. It is not about cure.

For some this is difficult message to accept - however many people will have already realised that medication or surgery has not been able to 'fix' their problem and so they are enthusiastic about something else they can try.

Program topics:

~Managing thoughts and feelings (CBT - over arching framework) Active, but pacing self - not over or under

~ Active and understanding posture and biomechanics , building achievements

~Goal setting

~Relaxation

7. Describe a model of stages of behavior change

Ans/

1-Pre contemplation

2-contemplation

3-preparation

4-action

5-maintenance

8. Describe psychological theories of child development and consider the implications of these theories for practice.

Ans/

1- Attachment theory developed by Bowlby to understand relationship between infants and their Primary Care-givers, and practice on Bowlly days was: Visits was limited, wards were Sterile and clinical

2- Paget theory wild to understand Cognitive development in human and it used in Practice in Classrooms and teachers must develop better to understand students thinking.

9. describe a psychological model for use in the assessment and formulation of sexual dysfunctions

Ans/

1- predisposing factor

2- precipitants

3- maintaining factor.

10. Discuss the concepts of compliance, adherence and concordance Consider factors influencing adherence, and how .adherence to medical advice might be improved?

Ans/

1- More patients comply if physician is warm, caring, friendly & interested

2- Perceived interpersonal competence (social conversation, better communication, more information) & more technical competence increase adherence.

3- Positive behaviors : good eye contact, smile, lean towards the patient increase adherence

11. Assess the impact of issues relating to diversity, equality, and discrimination on health behaviors and outcomes, with a focus on the lesbian, gay, bisexual and transgender (LCBT population) ?

Ans/ Increased stress ,Low self esteem ,Isolation ,Increased conflict , Sub-culture ,Distrust of authorities ,Discriminatory healthcare.

12. Outline key psychological therapies and indicate which types of patients may benefit from these approaches

Ans/

1- Cognitive behavioral therapy:

Depression , anxiety , eating disorder, sexual dysfunction ,schizophrenia , psychoses

2- Psychodynamic therapy:

Interpersonal difficulty , personality problem , Capacity to tolerance mental pain , interest in self exploration

3- Humanistic therapy:

Mild-moderate difficulties : Life event (ill) , depression , mild anxiety/stress, relationship difficulties

4- Systemic and Family therapy :

Family issues, child and Adolescent issue , relationship difficulty , mental health problem

13. Outline the role of psychological therapies and interventions

Ans/

• Cognitive behavioral therapy (CBT)

- Thoughts, feelings and behavior interlinked: How you think about situations affects the way you feel and what you do

- Identity unrealistic/unhelpful thoughts, feelings, and behaviors & work out how to change them

- Focused on 'here and now' issues

14. Piagets stages o f child development?

Ans/

1-Sensory-motor (0-2 yrs)

2-Pre-operational (2-7 yrs)

3-Concrete operational (7-12 yrs)

4-Formal operational (12 yrs +)

15. Define gay , lesbian, bisexual , intersex

Ans/

~Lesbian : Who experiences Sexual & emotional attraction to women of socks female Partners.

~Gay: Who experiences sexual & emotional attraction to the same Sex & seeks partners of the Same Sex.

~Intersex : Intersex people are individuals born with anatomy & physiology that differs from constitutes '"normal " male and female ,

they have congenital anomaly , used to be called HermaPhrodites .

Infection & Immunity

1. mention the mechanism of action of the following **antimicrobial** agent:-

1- **Ciprofloxacin**: :It works by inhibiting bacterial DNA gyrase and topoisomerase IV, enzymes involved in DNA replication and repair

2- **Fomivirsen**: works by inhibiting the replication of CMV DNA.

3- **Teicoplanin**: causes disrupting the assembly and cross-linking of the peptydo-glycan ,leading to bacterial cell death

4- **Efavirenz**: non-nucleoside reverse transcriptase inhibitors (NNRTIs). Efavirenz binds to and inhibits the reverse transcriptase enzyme of HIV, preventing the conversion of viral RNA into DNA

5- **Cidofovir** : inhibits viral DNA Polymerase

2. Enumerate HLA types and associated disease?

Ans/

There are two classes of HLA :

~Class one are (HLA-A,B,C). ~Class two are (HLA-DR,DQ,DP) .

Examples:

-HLA-B:ankylosing spondylitis

- HLA-A:myasthenia gravis

- HLA-C: crohn's disease

- HLA-DQ:coeliac disease

- HLA-DR:multiple sclerosis

3. Antibiotic are a major selection pressure on the composition of Hospital environmental microbial microbiota , describe why selection pressure is vulnerable in hospital's environmental microbes microbiota?

Ans/

In a hospital environment, selection pressure on microbial communities can be vulnerable due to factors such as frequent antibiotic use, exposure to disinfectants, and the presence of immune-compromised patients. These conditions create an environment where microbes with resistant traits can thrive, leading to the development of antibiotic-resistant strains

4. Enumerate species of bacteria that may cause meningitis

Ans/

1-Neisseria meningitidis (meningococcus)

2-Streptococcus pneumoniae (pneumococcus)

3-Haemophilus influenzae (type B)

4-Listeria monocytogenes

5-Group B Streptococcus (Streptococcus agalactiae)

6-Escherichia coli (certain strains)

7-Mycobacterium tuberculosis (tuberculous meningitis)

5. Causative agent of the following

1- Ringworm -> Dermatophyt

2- diphyllobothrium-> Diphyllobothrium latum

3- Plasmodium species that causes malarial

4-major respiratory infection in children->Respiratory Syncytial Virus

6. describe briefly the importance of gram stain in clinical medicine

Ans/

The Gram stain is a crucial microbiological technique with significant importance in clinical medicine. It involves staining bacterial cells to differentiate them into two major groups: Gram-positive and Gram-negative. This differentiation is based on the differences in the cell wall structure of bacteria.

7. Describe briefly what is celiac disease?

Ans/

Celiac disease is an autoimmune disorder where consuming gluten (from wheat, rye, and barley) leads the immune system to damage the small intestine lining. This damage affects nutrient absorption and causes symptoms. Detection of antibodies against tissue transglutaminase aids in diagnosis. A gluten-free diet can reverse the condition's effects.

8. How are bacteria detected genotypically and Phenotypically ?

Ans/

Bacteria can be detected through two main methods: genotypic and phenotypic. Genotypic methods examine bacterial genetic material using techniques like PCR, DNA sequencing, and microarrays to identify specific genes. Phenotypic methods observe physical traits such as growth patterns, colony appearance, and biochemical reactions, using methods like microscopy, biochemical tests, and growth on specific media. Both methods provide important information for identifying and classifying bacteria.

9. detection of organisms based on molecular and immunological methods?

Ans/

~~Molecular Methods:

1-Polymerase Chain Reaction (PCR): Amplifies DNA sequences specific to the target organism, allowing its detection.

2-Real-time PCR

3--DNA Sequencing

4-Loop-mediated Isothermal Amplification (LAMP)

5-Nucleic Acid Hybridization

6-Next-Generation Sequencing (NGS)

~~Immunological Methods:

1-Enzyme-Linked Immunosorbent Assay (ELISA)

2-Western Blot

3-Immunofluorescence

4-Flow Cytometry

5-Immunohistochemistry

10. natural killer cell is encounter cell, How do normal cells distinguished from abnormal cells from natural killer cells?

Ans/

NK cells have two types of receptor which are responsible for recognizing self cell from non self:

~The first type of receptor is an inhibitory receptor which recognizes (self MHC class l) molecule and delivers an inhibitory signal to the NK cell

~The second type is an activating receptor which recognizes (non-self or stress signals) and activates the NK cell

12. Acute respiratory tract infections are responsible for Large numbers of GP consultation and hospital admission each winter for what?

Ans/

croup (children), bronchiolitis (children), primary viral pneumonia, otitis media and febrile convulsions (young children). They (especially influenza) are associated with secondary viral pneumonia, and possibly bacterial meningitis.

13. Enumerate the following

-The ways of preventing microbial microbiota that may cause hospital acquired infection:

Ans/

~The most important way of preventing exogenously acquired infection is

1-hand hygiene(include hand-washing, alcohol gel hand rubs and sterile gloves

2-high standards of environmental cleanliness

3-judicious antibiotic prescribing

4-disposable gowns, aprons and gloves

5-sterile surgical instruments

~Endogenously acquired infection can be minimised by

1-disinfection of skin

2-Prophylaxis

-Types of vaccines:

Ans/

Live Attenuated Vaccines , fractionated , Recombinant , killed

-The species of enterobacteriaceae that cause infection in human:

Ans/

1-Escherichia coli (E. coli)

2-Salmonella spp

3-Klebsiella pneumoniae

4-Enterobacter spp

5-Citrobacter spp

6-Shigella spp

-Virulence factors associated with enterobacteriaceae:

Ans/

1-Endotoxins

2-Exotoxins

3-Iron Acquisition Systems

4-Capsules

5-Biofilm Formation

6-Adhesins