**Question 1**

A patient taking isoniazid for the a TB infection can become susceptible to the following vitamin deficiency

A V-B1

B V-B6

C V-B3

D V-B12

Explanation B

Miscellaneous reactions to isoniazid (INH) include haematological abnormalities, provocation of a vitamin B6 deficiency (pyridoxine), and tinnitus and GIT discomfort. INH can reduce the metabolism of phenytoin, increasing its blood levels and toxicity

Vitamin B6 is involved in the process of making serotonin and norepinephrine. Vitamin B6 is also involved in the formation of myelin.

Note:

Pellagra-vit B3 deficiency: the FOUR Ds of deficiency

Dermatitis, diarrhoea, dementia and death

**Question 2**

A patient is taking Rifampicin, what should you tell them about the drug?

A It is not well absorbed orally and therefore should be taken on an empty stomach

B It reduces the effects of a patient's anticoagulant drugs

C Rifampicin can cause a flu like illness despite the correct dose ingestion

D Rifampicin cause harmless greenish discolouration of tear, sweat and urine

Explanation B

Rifampicin is an antibiotic produced by Strep mediterranei. It is active against gram positive and negative bacteria, mycobacteria and chlamydiae. There is no cross resistance to other class of antimicrobial agents.

Rifampicin inhibits the B subunit of bacterial DNA dependent RNA polymerase and thereby inhibits RNA synthesis.

Rifampicin is well absorbed orally and excreted mainly through the liver into bile. It undergoes enterohepatic circulation

Indications:

Acute tuberculosis. (It must be administered with other agents to prevent multidrug resistant strains). An oral 600mg dose twice daily can eliminate meningococcal carriage. It can be used as prophylaxis in contact of children with Haemophilus influenza b. It is also used to eradicate staphylococcal diseases such as osteomyelitis and prosthetic valve endocarditis

Adverse reactions:

Harmless orange colour to urine, sweat and tears. It can cause cholestatic jaundice and hepatitis. It induces the p450 system that increase the elimination of drugs including methadone, anticoagulants and some anticonvulsants. If administered less often than twice weekly, it may cause a flu like syndrome characterized by fever, chills, myalgis, anaemia and thormbocytopaenia. It has been associated with acute tubular necrosis

Dosing schedule

Active TB: daily dose. (if follow intermittent dosing- it is recommended 2-3 times a week (6m)

Latent TB: daily dose (4m)

**Question 3**

Sulphonamides are a structural analogues of which of the following?

A PABA

B Tetrahydrofolate

C Dihydrofolate

D Folic acid

Explanation A

Sulphonamides: "Folate Antagonist", a DNA synthesis inhibitors. -Competitive inhibitor of Di-hyrdopteroate synthase -Structurally similar to PABA (Para-amino-benzoid acid), a precursor required by di-hydropteroate synthase for production of di-hydropteroic acid and subsequent folate synthesis. -A synergistic effect with Trimethoprim, another "Folate Antagonist" which inhibits Di-hydrofolate reductase.

**Question 4**

Regarding amphotericin B, which of the following statements is correct?

A It can be given orally to treat systemic illness

B Its dose needs to be reduced in renal impairment

C It can cause fever, headache and confusion

D Liver toxicity is the most significant toxic side effect

Explanation C

Amphotericin is only given orally to treat a fungal infection in the gut. The immediate side effects seen are due to an infusion related toxicity which can be ameliorated by slowing down the infusion rate or decreasing the daily dose. Hepatic and renal impairment have little or no effect on drug concentrations. Renal damage is the most significant toxic reaction

**Question 5**

Regarding zidovudine (AZT), which of the following statements is correct?

A It has a short half life

B It is not used to treat retroviruses

C It blocks thymidine kinase

D It has a similar mechanism of action to amantadine

Explanation A

AZT is used to treat retroviral infections. AZT inhibits reverse transcriptase of HIV1/HIV2. Amantadine blocks the M2 proton ion channel of the virus particle and inhibits uncoating of the viral RNA within infected host cells, thus preventing its replication. AZT is well absorbed from the gut (63%) and widely distributed to body tissues and fluids including CSF.

 Note: Although AZT has a serum half life of 1.1hrs (a short half life), the intracellular half life of the phosphorylatedcompound is 3-4hrs hrs, allowing twice daily dosing.

**Question 6**

Regarding cephalosporins, which of the following statements is incorrect?

A Ceftazadime has activity against pseudomonas

B Third generation cephalosporins have greater gram negative cover than first generation cephalosporins

C Cefaclor is a first generation cephalosporin

D They are not as sensitive to beta-lactamase as penicillins

Explanation C

Cefaclor is a second generation Cephalosporin. Other 2nd generation cephalosporins include: cefoxitin, cefotetan, cefuroxime, cefprozil, cefmetazole, loracarbef and cefonicid

**Question 7**

Regarding metronidazole, which of the following statements is correct?

A It is highly protein bound

B It increases the anticoagulant effects of warfarin

C It poorly penetrates the CSF

D It has a low bioavailability

Explanation B

Metronidazole is an antiprotozoal drug with antibacterial activity against anaerobes. It is the treatment of choice for trichomonas-2g stat. It is well absorbed after oral administration and has a bioavailability of over 90% and readily penetrates the CSF. It has a low protein binding (10-20%). It produces a disulfiram like effect- the inhibition of acetaldehyde dehydrogenase and the accumulation of acetaldehyde and an increased "hangover effect". It inhibits CYP 3A4 (the P450 associated with metabolism of 50% of all drugs) and therefore potentiates the effect of warfarin.

**Question 8**

A patient with impetigo would be most likely to respond to which of the following drugs?

A Streptomycin

B Cephalexin

C Metronidazole

D Phenoxymethylpenicillin

Explanation B

Impetigo is an acute, highly contagious gram-positive bacterial infection of the superficial layers of the epidermis. Its classified as non-bullous(70% of cases) or bullous Impetigo is caused by bacterial infection. Both Group A beta hemolytic streptococci and S aureus cause nonbullous impetigo, whereas bullous impetigo is caused almost exclusively by S aureus. For antibiotic therapy, the chosen agent must provide coverage against both Staphylococcus aureus and Streptococcus pyogenes. Topical mupirocin is adequate treatment for single lesions of nonbullous impetigo or small areas of involvement. It is applied to the affected area 2 to 3 times daily. A 7-day course is usually standard, although few large studies have been performed to verify this as the most effective approach. Systemic antibiotics are indicated for extensive involvement or for bullous impetigo. A cephalosporin, semisynthetic penicillin, or beta-lactam/beta-lactamase inhibitor combination is generally suitable for first-line therapy. Phenoxymethylpenicillin above does not cover staph. Streptomycin and Metronidazole are clearly not indicated.

**Question 9**

Which of the following vaccines is a live virus vaccine?

A Typhoid

B Rabies

C HBV

D Measles

Explanation D

Typhoid vaccine-live bacteria,

HBV-inactive viral antigen,

rabies-inactive virus

Extra: Actually there are 2 types of Typhoid vaccines: 1. Killed vaccine- Given as a shot 2. Live (attenuated) vaccine- Given orally

**Question 10**

Regarding macrolide antibiotics, which of the following statements is correct?

A They are usually active against neisseria species

B They bind at the 30 s ribosome sub-unit

C They are bacteriostatic but not bactericidal

D They enhance metabolism by cytochrome pathways

Explanation A

Macrolides bind to the 50s subunit of the ribosome, they are both bactericidal and bacteriostatic. They inhibit the p450 system and thus increase the concentration of multiple drugs. Resistance to the macrolide is achieved by the reduction of the permeability of the bacterial cell wall, efflux pumps, production of esterases and modification of the ribosomal binding site. Macrolides are effective against both gram positive and negative bacterial

**Question 11**

Which of the following is a second generation cephalosporin?

A Cefoxitin

B Cephalexin

C Ceftazidime

D Cephalothin

Explanation A

Other 2nd generation: cefaclor, cefotetan, cefuroxime, cefprozil, cefmetazole, loracarbef and cefonicid

Extra: 1st Gen: Cefadroxil, Cephalexin, Cephadrine,Cephapirin, Cephalothin, Cefazolin. Cefazolin is the only parenteral 1st Gen ceph in general use.It is the drug of choice for surgical prophylaxis. It penetrates well into most tissues. It does not penetrate CNS. It is an alternative to antistaphylococcal penicillin for patients who are allergic to penicillins. 3rd Gen: Cefoperazone, Cefotaxime, Ceftazidime, Ceftizoxime, Ceftriaxone, Cefixime, Cepodoxime proxetil, Cefdinir, Cefditoren pivoxil, Ceftibuten and Moxalactam 4thGen: Cefepime Generally Cephalosporins are not active against enterococci and L monocytogenes. Cephalosporins similar to penicillins, but more stable to many bacterial beta lactamses. 1st Gen- Most active against Gram positives 2nd Gen- Gram +ves and gram -ves 3rd Gen- have expanded gram neg coverage compared to 2nd gen.

**Question 12**

The cephalosporin with the highest activity against gram positive bacteria is?

A Cephalothin

B Cefaclor

C Cefipime

D Cefuroxime

Explanation A

Cephalothin is a first generation cephalosporin. First generation cephalosporins are very active against gram-positive cocci, such as pneumococci, streptococci and staphylococci.

Fourth generation cepahlosporins-cefepime is active against Streptococcus pneumoniae, and Groups A and B streptococci. Though active against methicillin-susceptible Staphylococcus aureus (first generation cephalosporins are not), it is less potent than the 1st and 2nd generation agents.

Cefepime is active against P aeruginosa, enterobacteriaceae, Haemophilus and Nisseria

Cefaclor and cefuroxime are second generation cephalosporins have gram positive and gram-negative spectrums

 Nice way to remember the first generation cephalosporins is they almost all have spelling with "ceph" whereas the rest have "cef"

**Question 13**

Which class of antibiotics listed below does not possess a beta-lactam ring?

A Cephalosporins

B Carbapenams

C Fluoroquinolones

D Monobactams

Explanation C

Fluroquinolones are synthetic fluorinated analogs of naladixic acid

**Question 14**

Which of the following antibiotics does not exert its action by inhibiting cell wall synthesis?

A Vancomycin

B Ceftriaxone

C Erythromycin

D Imipenem

Explanation C

Ceftriaxone: Third generation cephalosporin which is a structural analog of the D-Ala-D-Ala substrate which inhibits peptidoglycan synthesis, cross linking, resulting in cell death

Vancomycin = Glycopeptide. MOA same as penicillins

Imipenem = Carbapenem. Structurally related to beta-lactam antibiotics

Erythromycin = Marcolide. Binds to 50S ribosomal RNA + inhibits formation of 50S ribosomal subunit. Inhibitory at low concentrations and bactericidal at higher concentrations.

**Question 15**

Regarding erythromycin, which of the following statements is correct?

A It has a large cross-reactivity with the penicillins

B It is inactivated by beta-lactamases

C It is bacteriostatic only

D It binds to the 50 s sub-unit of the bacterial ribosome

Explanation D

Macrolides bind to the 50s subunit of the ribosome, they are both bactericidal and bacteriostatic. They inhibit the p450 system and thus increase the concentration of multiple drugs. Resistance to the macrolide is achieved by the reduction of the permeability of the bacterial cell wall, efflux pumps, production of esterases and modification of the ribosomal binding site. Macrolides are effective against both gram positive and negative bacterial

**Question 16**

Penicillins reach high concentrations in which of the following?

A Vitreous humour

B Tubular fluid in kidneys

C CSF with normal meninges

D Breast milk

Explanation B

Penicillin is excreted into sputum and milk to levels 3-15 % of those in serum. penetration into eye, prostate, CNS is poor. However, with active inflammation much higher levels can be achieved.. Penicillin is rapidly excreted in the kidneys. 10% by glomerular filtration, 90% by tubular excretion

**Question 17**

Regarding Zidovudine ( AZT), which of the following statements is correct?

A It has a half life of 1-3 hrs

B It has no activity against retroviruses

C It inhibits viral thymidine kinase

D It is not well absorbed from the gut

Explanation A

AZT is used to treat retroviral infections. It has a half-life of 1-3hrs. The serum half-life averages 1 hour and the intracellular half-life of the phosphorylated compound is 3.3 hours. AZT inhibits reverse transcriptase of HIV1/HIV2. AZT is well absorbed from the gut (63%) and widely distributed to body tissues and fluids including CSF. Plasma protein binding is 35%. AZT is eliminated primarily via the kidney following glucoronidation by the liver

**Question 18**

Of the antiviral drugs listed, which one acts on reverse transcriptase?

A acyclovir

B ganciclovir

C zidovudine

D vidarabine

Explanation C

Ganciclovir, acyclovir, and vidarabine are all nucleoside analogues and all inhibit viral DNA polymerase after being activated by viral kinase phosphorylation.

**Question 19**

Regarding metronidazole which of the following statements is not true?

A It inhibits alcohol dehydrogenase

B It is used to treat Gardnerella (vaginalis)

C It causes a metallic taste in the mouth

D It is useful against trichomonas vaginalis

Explanation A

Metronidazole is an antiprotozoal drug with antibacterial activity against anaerobes. It is well absorbed after oral administration and readily penetrates the CSF. It produces a disulfiram like effect- the inhibition of aldehyde dehydrogenase and the accumulation of acetaldehyde

**Question 20**

Acyclovir has therapeutic action against all of the following viruses, except?

A HSV 1

B HZV

C CMV

D HSV2

Explanation C

In vitro testing shows some weak activity against CMV, EBV and HHV-6.

The agents used to treat CMV infections are: Valganciclovir Ganciclovir Foscarnet and Cidofovir

**Question 21**

Regarding acyclovir, which of the following statements is correct?

A It is commonly given in doses of 10-20 mg TDS

B It is a guanosine analogue

C It is used to treat CMV

D It acts to inhibit viral entry into cells

Explanation B

Acyclovir is given in doses of 10-20mg/kg. It is not useful against CMV in vivo. It inhibits viral DNA synthesis and is administered via an oral or intravenous route. Oral bioavailability is low (15-20%) and is unaffected by food. Half life 2-3 hrs and excreted primarily by glomerular filtration and tubular secretion.

**Question 22**

Regarding amantadine, which of the following statements is correct?

A It is an antiviral drug

B It potentiates dopaminergic function

C It causes acute psychosis

D All of the above

Explanation D

Amantadine blocks the M2 proton ion channel of the virus particle and inhibits uncoating of the viral RNA within infected host cells, thus preventing its replication. One of the side effects is that it produces insomnia and not sedation. It is active against influenza A only. Clinical manifestations of anticholinergic activity tend to be present in acute amantadine overdose. It is an antiviral drug that was by chance found to have antiparkinsonism properties; it may potentiate dopaminergic function by influencing the synthesis, release or uptake of dopamine

**Question 23**

All of the following antibiotics inhibit nucleic acid synthesis except?

A Norfloxacin

B Sulfasalazine

C Rifampicin

D Chloramphenicol

Explanation D

Norfloxacin inhibits DNA replication, trimethoprim blocks purine production, rifampicin blocks production of RNA and sulfasalazine is involved DNA blocking activities-although the process is not well understood.

Chloramphenicol is a bacteriostatic drug that stops bacterial growth by inhibiting protein synthesis. Chloramphenicol prevents protein chain elongation by inhibiting the peptidyl transferase activity of the bacterial ribosome.

**Question 24**

Regarding gentamicin, which of the following statements is correct?

A It is not nephrotoxic

B It enters cells by an oxygen dependent influx

C It decreases the effect of neuromuscular junction blocking drugs

D It has a large theraputic index

Explanation B

Gentamycin is effective against gram positive and gram-negative bacteria but not against anaerobes. It prevents protein synthesis of the bacteria. The drug is transported actively across the cell membrane into the cytoplasm by an oxygen dependent process. Many bacteria are resistant to gentamycin owing to the inability of gentamicin to penetrate the cell wall. This is overcome when a penicillin or vancomycin is added in combination. These inhibit cell wall synthesis allowing gentamicin to enter the bacteria; it is a bactericidal combination. Gram-negative resistance is due to plasmid encoding aminoglycoside-modifying enzymes. It is both ototoxic and nephrotoxic. Gentamicin increases the effect of the neuromuscular blocking agents (including suxamethonium). Gentamicin has both a concentration dependent killing and post antibiotic properties and a narrow therapeutic index.

**Question 25**

Regarding trimethoprim, which of the following statements is incorrect?

A It is synergistic with sulphonamides

B It is less toxic to humans than bacteria

C It causes folate synthesis disruption

D It is bacteriocidal

Explanation D

Trimethoprim and sulphonamides block sequential steps in bacteria folate synthesis, and when used in combination have a synergistic effect that is often bactericidal. Alone, each agent is generally only bacteriostatic

**Question 26**

Which of the following drugs listed below is a cell wall inhibitor?

A Cephalosporin

B Ciprofloxacin

C Tetracycline

D Gentamicin

Explanation A

Tetracyclines--- Inhibit Protein synthesis Gentamicin (Aminoglycoside) --- Inhibit Protein synthesis Ciprofloxacin (Fluoroquinolone) - DNA gyrase inhibition, thereby inhibiting cell division.

**Question 27**

Which of the following antibiotics is resistant to staphlococcal beta-lactamase?

A Piperacillin

B Amoxicillin

C Cloxacillin

D Penicillin

Explanation C

Methicillin, nafcillin and isoxazolyl penicillins are resistant to staphlococcal beta lactamase. The isoxazolyl penicillins include oxacillin, cloxacillin and dicloxacillin. Methicillin is no longer used due to its nephrotoxicity.

**Question 28**

Which of the following statements is true regarding penicillins?

A Food does not impair absorption of penicillins

B Penicillin can cause seizures.

C 50% of people with a previous reaction to penicillin will have another reaction

D Penicilllins do not cause hypernatremia

Explanation B

Hypernatraemia can occur if penicillin is given in very high doses and patients have renal or cardiovascular diseases. Seizures occur in patients with renal failure who are given high dose penicillin. There is a 5-10% chance of second reaction. Only amoxicillin can be given with food. Most of the other penicillins absorption is impaired by food and the drugs should be administered at least 1-2hrs before or after a meal.

**Question 29**

Of the drugs listed, which inhibits cell membrane function?

A Amphotericin B

B Erythromycin

C Vancomycin

D Amikacin

Explanation A

Amikacin inhibits the 30s ribosome subunit (protein synthesis). Erythromycin inhibits protein synthesis. Vancomycin inhibits cell wall synthesis

Amphotericin B binds to ergosterol (a component of fungal cell walls), and alters the permeability of the cell membrane by forming pores, allowing leakage of intracellular ions, which leads to cell death

**Question 30**

Regarding cephalosporins, which of the following options is incorrect?

A Generally they have a wider spectrum of activity compared to pencillins due to beta-lactmase resistance

B 2nd generation cephalosporins have greater gram negative activity than first generation cephalosporins

C Cefaclor is a second generation cephalosporin

D ceftriaxone has anti-pseudomonal activity

Explanation D

Ceftazidime (3rd gen), Cefoperazone (3rd gen) and Cefepime (4th gen) have anti-pseudomonal activity.

**Question 31**

Which antibiotic is a cell wall inhibitor?

A Erythromycin

B Vancomycin

C Streptomycin

D Gentamycin

Explanation B

Cephalosporins and penicillins are also cell wall inhibitors

**Question 32**

Regarding pentamidine, which of the following statements is correct?

A It is an antiretroviral agent

B It can cause iatrogenic diabetes

C It is a protease inhibitor

D It should be avoided in HIV patients

Explanation B

Pentamidine is an antirprotozoal drug. It interferes with nuclear metabolism. It can be toxic to the beta cells of the pancreas and cause diabetes. It is used as an agent for prophylaxis against pneumocystosis in immune compromised patients e.g. HIV patients (used when Bactrim is contraindicated)

**Question 33**

Regarding Penicillin G, which of the following statements is correct?

A Hypernatraemia is not reported

B 100 000u intrathecally can cause seizures

C It has good penetration to the eye

D 50% of people who claim allergy will have an allergic reaction on further exposure

Explanation B

Hypernatraemia can occur if penicillin is given in very high doses and patients have renal or cardiovascular diseases. Seizures occur in patients with renal failure who are given high dose penicillin. There is a 1-5% chance of a second reaction. Only amoxicillin can be given with food to prevent the drug binding with the food and not being absorbed or gastric acid neutralizing the drug

Note: Penicillin can be given intrathecally but this route is not recommended as it can cause encephalopathy, seizures and death. If intrathecal penicillin is necessary the dose should be halved. The IV route is safe due to the protective features of the blood brain barrier.

100000U of Penicillin is roughly 100mg. Doses >12mg intrathecal or in patients with severe renal failure can produce seizures and should be avoided

**Question 34**

Which of the following drugs causes hypoprothrombinaemia & bleeding disorders?

A Cefuroxime

B Cefotetan

C Cefaclor

D cefoxitin

Explanation B

Cephalosporins containing a methylthiotetrazole group can frequently cause hypoprothrombinaemia and bleeding disorders preventable by administration of vitamin K twice weekly (10mg). Such cephalosporins include cefamandole, cefmetazole, cefotetan and cefoperazone. These dugs can also cause a severe disulfiram like reaction thus alcohol should be avoided during treatment with these cephalosporins. All the above are second generation cephalsporins. Cefuroxime, cefaclor and cefoxitin do not contain a methylthiotetrazole (MTT) group

**Question 35**

Regarding erythromycin, which of the following statements is correct?

A It is predominantly renally excreted

B It is bacteriostatic only

C It is a cell wall inhibitor

D It is effective against Campylobacter jejuni

Explanation D

Erythromycin is excreted mostly in bile and feces. Only 5% is excreted in the urine. It inhibits protein synthesis. It has bacteriostatic activity against susceptible bacteria and at higher concentrations it is bactericidal.

Inhibition of protein synthesis occurs via the binding to the 50S ribosomal RNA.

**Question 36**

Which antibiotic-mechanism of action pairing is correct

A Vancomycin-inhibition of cell wall synthesis

B Chloramphenicol-Inhibition of DNA synthesis

C Azithromycin-inhibition of the 30s ribosome

D Aminoglycosides-inhibition of protein synthesis via the 50s ribosomal subunit

Explanation A

Vancomycin inhibits cell wall synthesis by binding to the D-Ala-D-Ala terminus of nascent peptidoglycan pentapeptide. The cell membrane is also damaged, which contributes to the antibacterial effect. It is active only against gram positive bacteria

Azithromycin-inhibition of the 50s ribosome

Chloramphenicol-Inhibition of protein synthesis

Aminoglycosides-inhibition of the 30s ribosome

Note: Inhibiotn of the ribosome at the 30s and 50s subunits lead to an inhibition of protein synthesis

**Question 37**

A man returns from South Africa with a Plasmodium Vivax infection. Which of the following statements is correct?

A Artemisinins is the new treatment of choice

B Treatment with doxycycline and quinine is satisfactory

C Treatment with chloroquine alone is satisfactory

D Primaquine should be avoided in G6PD deficiency

Explanation D

Chloroquine is the drug of choice in treatment of non falciparum and sensitive falciparum malaria. Chloroquine does not eliminate dormant liver forms of P. vivax and P. ovale and therefore primaquine must be added for the radical cure of these species. Artemisinin based therapy is now standard for the treatment of uncomplicated F. malaria. New trials suggest good effect even in complicated F. malaria. Both quinine and choloquine can induce haemolysis in patients who are G6PD defecient. Doxycyline together with quinine is used for the treatemnt of P. falciparum

**Question 38**

Which of the following best describes the mechanism of action of ciprofloxacin?

A Inhibition of dihydropteroate synthase

B DNA gyrase inhibitor

C Ribosomal translocation inhibition

D Irreversible inhibitors of protein synthesis

Explanation B

Fluroquinolones are active against a variety of gram + and gram - bacteria. They block bacterial DNA synthesis by inhibiting bacterial topoismerase (DNA gyrase). Inhibition of DNA gyrase prevents the relaxation of supercoiled DNA that is required for normal transcription and replication. Fluorinated derivatives- ciprofloxacin, levofloxacin and norfloxacin have improved antibacterial activity compared with nalidixic acid and also achieve bactericidal levels in blood and tissues

Inhibition of dihydropteroate synthase= sulfonamides

Irreversible inhibitors of protein synthesis= aminoglycosides

Ribosomal translocation inhibition= macrolides

**Question 39**

Regarding the penicillins, which is INCORRECT?

A Can be used for enterococcal meningitis.

B Mostly excreted by tubular secretion

C Does not need to be adjusted in renal failure Correct Answer

D Concentration is most tissues are equal to serum

Explanation C

Penicillin concentration in most tissues is equal to those in serum. Penicillins also excreted into sputum and milk. Penicillin is rapidly excreted by the kidneys. About 10% is by glomerular filtration and 90% by tubular secretion. The normal half life of penicillin G is 30m. Ampicillin and extended spectrum penicillins have half lives of 1 hour. For penicillins that are cleared by the kidney, the dose MUST be adjusted in renal failure. Nafcillin is biliary excreted. Oxacillin, dicloxacillin and cloxacillin are renally and biliary excreted and thus the dose does not need to be adjusted. They are effective against enterococcal meningitis as they are able to cross the inflamed meninges. High doses are required (and with aminoglycosides)

**Question 40**

Administration of tetanus toxoid provides what type of immunity?

A Artificial passive

B Natural passive

C Artificial active

D Natural active

Explanation C

Tetanus toxoid is a form of tetanus toxin which has been damaged by heat or formalin so that it is not dangerous, but is still immunogenic. It can be administered to the patient, who then develops anti-toxin antibodies. Since the patient develops his/her own antibodies, this is an example of active immunity. As the antibodies are produced against a manufactured substance,(such as a toxoid or a vaccine) and not the organism itself, it is artificial. In passive immunity, antibodies are formed in another person or organism and transferred to the affected individual. An example of natural, passive immunity is antibodies transferred from mother to child across the placenta. An example of artificial passive immunity is tetanus anti-toxin, antibodies formed by other individuals and transferred to a person following tetanus exposure. Note that tetanus toxoid and tetanus antitoxin are two different substances, the first causing antibody production, and the second giving passive immunity from disease.

**Question 41**

Erythromycin increases which of the following drug serum concentration by increasing its oral bioavailability?

A Prednisolone

B Warfarin

C Cyclosporine

D Digoxin

Explanation D

Macrolides including erythromycin and clarithromycin (but not azithromycin-and is therefore free of drug interactions that occur with other macrolides) inhibit the P450 enzymes and thus increase the serum concentrations of numerous drugs e.g. theophylline, oral anticoagulants, cyclosporine and methylprednisolone. Erythromycin increases the serum concentration of oral digoxin by increasing its bioavailability.

Note: The above statements are referring to two separate ideas (I think)

1-Oral bioavailability will be affected by the first pass of the liver and its enzymes. However, warfarin has 100% bioavailability. Its serum concentration rises due to the fact that macrolides inhibit the p450 enzymes inhibiting warfarin's metabolism, thus increasing its serum concentration. Theophylline is similar (bioavailability is 100%)

2-There is evidence that erythromycin increases digoxin's oral bioavailability. The mechanism is unclear but it may be related to the destruction of intestinal flora, which plays a role in digoxin’s metabolism. Removal of this flora by erythromycin and more digoxin will be absorbed.

**Question 42**

Which of the following drugs is the treatment of choice for Trichomoniasis?

A Metronidazole

B Trimethoprim-sulfamethoxazole

C Albendazole

D Tetracycline

Explanation A

Metronidazole is the treatment of choice. A single dose of 2g is effective. Tinidazole may be effective in metronidazole resistant infections. Metronidazole is also the treatment of choice for Giardiasis and Entamoeba Histolytica

**Question 43**

Which of the following cephalosporins do not cause hypoprothrombinaemia?

A Cefamandole

B Cefoperazone

C Cefotetan

D Cefoxitin

Explanation D

Hypoprothrombinaemia and bleeding disorders can be caused by cephalosporins that contain a methylthiotetrazole group. These include: cefamandole, cefmetazole, cefotetan and cefoperazone.