INFECTIOUS DISEASE
Questions&Answers

Q-1

A 62 year old IV drug abuser is brought into the emergency department with complaint of fever, shivering, malaise, shortness of breath and productive cough. Around 8 days ago he developed symptoms consistent with a flu-like illness. Initially there was an improvement in his condition but deteriorated over the past three days. He now has a temperature of 39 C, a pulse of 110 beats/minute, a blood pressure of 100/70 mmHg and a respiratory rate of 22 breaths/minute. A chest x-ray shows bilateral cavitations. What is the SINGLE most likely causative organism?

A. **Mycoplasma pneumoniae**
B. **Staphylococcus aureus**
C. **Chlamydia pneumoniae**
D. **Eschericia coli**
E. **Klebsiella pneumoniae**

ANSWER:
Staphylococcus aureus

EXPLANATION:
Staphylococcus aureus may complicate influenza infection and is seen most frequently in the elderly and in intravenous drug users or patients with underlying disease. Chest x-ray shwos bilateral cavitations. Remember, there is a high incidence of Staphylococcus aureus pneumonia in patients following influenza so in PLAB if you see a patient with a flu-like illness which symptoms are now of pneumonia, the likely causative organism is Staphylococcus aureus.

Q-2

A 28 year old man presents with a widespread maculopapular rash over his soles and palms. He also has mouth ulcers. He had a penile ulcer which healed six weeks ago. What is the SINGLE most likely organism responsible?

A. **Mycoplasma genitalium**
B. **Treponema pertenue**

C. **Treponema pallidum**
D. **Lymphgranuloma venereum**
E. **Herpes simplex virus type 2**

ANSWER:
Treponema pallidum

EXPLANATION:
Syphilis
Syphilis is a sexually transmitted infection caused by the spirochaete Treponema pallidum. Acquired syphilis is characterised by primary, secondary and tertiary stages. The incubation period is around 3 weeks.

Acquired syphilis
Primary features
• Chancre - painless ulcer at the site of sexual contact
• Local non-tender lymphadenopathy
• In women, they are found on the vulva, labia and, much less frequently, on the cervix.

Secondary features
• Secondary syphilis often appears 6 weeks after the beginning of the primary lesion but may overlap or not appear for several months.
• Systemic symptoms: fevers, lymphadenopathy, headaches, malaise.
• A generalised polymorphic rash often affects the palms, soles and face
• Papules enlarge into condylomata lata (pink or grey discs) in moist warm areas.

Tertiary features
• Gummas (granulomatous lesions → can occur in any organ but most commonly affect bone and skin)
• Cardiovascular syphilis → ascending aortic aneurysms, aortic regurgitation
• Neurological syphilis → tabes dorsalis, dementia

Q-3

A 44 year old HIV positive man complains of a two week history of worsening headache, facial weakness and visual hallucinations. He also reports new onset of eye pain. An MRI head reveals multiple ring shaped contrast enhancing lesions. What is the SINGLE most likely causative organism?

A. **Cytomegalovirus**
B. **Streptococcus**
C. **Toxoplasma gondii**
D. **Herpes simplex virus**
E. **Pneumocystis jirovecii**

ANSWER:
Toxoplasma gondii

EXPLANATION:
The symptoms and MRI findings here are highly suggestive of toxoplasmosis, a disease caused by the protozoan Toxoplasma gondii.

The reason behind the HIV history is that toxoplasmosis can reactivate in those with severe HIV disease when their CD4 counts are very low (<50-100/µL).

Principle Manifestations usually include a brain mass lesion, headache, confusion, seizures, and focal neurologic deficits. These symptoms occur due to increased intracranial pressure. In patients with AIDS, cerebral toxoplasmosis should be right at the top of the list of differentials if one presents with focal neurological symptoms. Imaging such as CT or MRI scan of the head would show a "ring" (contrast) enhancing lesion with oedema. Scans may show solitary lesions or cortical atrophy. Given the choice of imaging modality, choose an MRI over a CT as MRI appears to be more sensitive than CT in imaging for cerebral toxoplasmosis.

TOXOPLASMOSIS
Toxoplasma gondii is a protozoa which infects the body via the gastrointestinal tract, lung or broken skin. Human infection occurs from consumption of undercooked meat or, foot or water contaminated with the oocytes. It's oocysts release trophozoites which migrate widely around the body including to the eye, brain and muscle. The usual animal reservoir is cats where oocytes are produced in the cat's intestines and shed in its faeces.

Interestingly, toxoplasma gondii is known to remove rats' fear of cats. Somehow infected rats are mildly attracted to the odour of cats which uninfected rats would usually run away from. This is thought to be an evolutionary adaptation to help toxoplasma gondii complete its life cycle: rats are exposed to cat faeces and are infected with toxoplasma gondii. They then lose their innate fear of cats and are more likely to be eaten by cats. Toxoplasmosis then sexually reproduces in the rat's gut. This brings new meaning to the term "Eat PrEy, Love".

Most infections are asymptomatic. Symptomatic patients usually have a self-limiting infection, often having clinical features resembling infectious mononucleosis (fever, malaise, lymphadenopathy). Other less common manifestations include meningoencephalitis and myocarditis.

Treatment:
Pyrimethamine plus sulphadiazine

Q-4

A 25 year old man was admitted to the hospital with a fever of 38.8 C and rigors. He complains of a three day history of general malaise, mild headaches, arthralgia and myalgia. He especially complained of bilateral calf pain. His past history is significant for a trip to the Caribbean from which he returned five days

ago. He describes the trip to the Caribbean with his friends as being amazing and describes a host of activities such as swimming, hiking and fishing. Upon further questioning, he also revealed that he noticed a red discoloration of his eyes before they turned to yellow. The patient also mentions seeing "spots" on his skin. On physical examination, the patient appears to be jaundiced. Abdominal examination revealed generalised abdominal tenderness.

His vitals are as follows:
Blood pressure 98/56 mmHg
Heart rate 122 beats per minute
Respiratory rate 18 breaths per minute
Oxygen saturation on room air 98%

Blood tests were done and the laboratory results are as follows:
Alanine transferase (ALT) 89 U/L (5-35 U/L)
Aspartate transaminase (AST) 60 U/L (5-35 U/L)
Alkaline phosphatase (ALP) 162 U/L (30-150 U/L)
Gamma glutamyl transferase (GGT) 33 U/L (8-60 U/L)
White blood cells 15 x 10^9/L (4-11 x 10^9/L)
Platelets 180 x 10^9/L (150-400 x 10^9/L)

What is the SINGLE most appropriate investigation in this scenario to confirm the diagnosis?

A. **Unconjugated bilirubin**
B. **Paul Bunnell test**
C. **Blood and urine culture and sensitivity**
D. **CSF analysis**
E. **ELISA for IgM antibodies**

ANSWER:
Blood and urine culture and sensitivity

EXPLANATION:
This patient is suffering from leptospirosis. Leptospirosis is the most widespread zoonotic infection worldwide. The main risk factor for acquiring the infection is direct or indirect contact with the urine of infected animals. Contact can occur secondary to occupational exposure or accidentally via exposure to unclean sources of water. Travelers and athletes participating in water sports, such as those who compete in triathlons, represent a growing population at risk. In the UK, ask for a history of rowing, fishing, contact with animals or travel. The red discoloration of the eye seen initially is subconjunctival haemorrhage which occurs in more than 90% of patients with leptospirosis. Aminotransferase levels are usually elevated but they are rarely higher than 200 U/L just as seen in this stem.

The single most appropriate investigation in this scenarior would be blood and urine

cultures. This is because leptospirosis can be isolated from blood during the initial phase for the first seven to ten days of the disease. Leptospirosis also can be isolated from urine but this usually occurs in the second stage called “leptospiruric phase” which usually occurs after 7 days.

A CSF analysis is a logical test to do as well however, a CSF analysis would show lymphocytic pleocytosis and elevated proteins which are not specifically diagnostic for leptospirosis however it can also be cultures to show evidence of leptospirosis. Nonetheless, a blood culture should be prioritised.

ELISA for IgM antibodies is not the correct option. IgM antibodies can only be detected after the fifth day of illness. ELISA for IgM antibodies can be done after day 5 of patient presentation, however it is not the most appropriate test to be done right now.

The Paul Bunnell test or the monospot test is a form of the heterophile antibody test. It is a rapid test for infectious mononucleosis due to the Epstein-Barr virus (EBV). This choice is therefore incorrect.

Remember, dark-field examination of blood, urine or CSF can demonstrate leptospira. Organisms can be isolated from blood and CSF in the first week of illness and can be isolated in urine samples from 7 days to a month from initial illness.

Most cases of leptospirosis present as mild, self-limiting, nonspecific febrile illness. If treatment is needed oral doxycycline can be prescribed for mild disease. IF there is severe disease then ampicillin or benzylpenicillin.

Q-5

An 82 year old man was brought into the emergency department with a low level of consciousness. His wife mentions that he had a severe headache for the last 20 hours and was very sensitive to light. He has a temperature of 39.0 C, a pulse of 118 beats/minute, a blood pressure of 80/55 mmHg and a respiratory rate of 32 breaths/minute. He is conscious but confused. Kernig’s sign was positive. High flow oxygen and IV fluids was immediately started. What is the SINGLE most appropriate immediate action?

A. Intravenous antibiotic
B. Lumbar puncture
C. Computed tomography brain scan
D. Head magnetic resonance imaging
E. Blood culture

ANSWER:
Intravenous antibiotic

EXPLANATION:
This man is having meningitis. Treatment for meningitis should be started before doing

any investigations due to the seriousness of the disease.

In a hospital setting, give intravenous third generaion cephalosporin antibiotics (ceftriaxone or cefotaxime)

Q-6

A 23 year old man has been using intravenous drugs. You explain to him the dangers of this, including the risk of contracting a blood borne virus such as Hepatitis B. Which of the following laboratory tests will first become abnormal after acquiring hepatitis B infection?

A. Bilirubin
B. Hepatitis B surface antigen
C. Hepatitis B core IgM antibody
D. Alanine aminotransferase (ALT)
E. Anti-hepatitis B e antibody

ANSWER:
Hepatitis B surface antigen

EXPLANATION:
Hepatittis B surface antigen (HbsAg) is a marker of acute hepatitis B infection and the first abnormal serological test. Hepatitis B e antigen (HbeAg) and Hepatitis B DNA also appear soon after. The presence of HbeAg in the serum of patients can serve as a marker of active replication.

Hepatitis B core IgM antibody indicates recent infection with hepatitis B virus (< 6 months). It appears shortly after the onset of symptoms, and at a similar time to the rise in alanine aminotransferase (ALT).

The presence of anti-hepatitis B e antibody (HbeAb) is a sign that the patient has moved into a non-replicative stage of chronic hepatitis B – usually due to treatment. It is not used as a marker of acute hepatitis B.

Hepatitis B is a DNA virus spread through contact with infected bodily fluids.

HEPATITIS B SEROLOGY TEST
It is likely you will be asked about hepatitis B serology tests, which are listed below:

Hepatitis B surface antigen (HbsAg):
- Indicates infection with the hepatitis B virus (positive in both acute and chronic)

Hepatitis B surface antibody (anti-HBs):
- Indicates recovery and immunity from hepatitis B virus
- Anti-HBs also develops in a person who has been successfully vaccinated

Hepatitis B DNA (HBV DNA)
- Indicates infectivity and active hepatitis B virus replication

Total hepatitis B core antibody (anti-HBc)
- Appears at the onset of symptoms in acute hepatitis and persists for life
- Presence of anti-HBc indicates previous or ongoing infection with hepatitis B virus in an undefined time frame

Hepatitis B core IgM antibody (IgM anti-HBc):
- Indicates recent infection with hepatitis B virus (< 6 months)
- Its presence indicates acute infection

Hepatitis B envelope antigen (HBe)
- Indicates active hepatitis B virus replication

Hepatitis B envelope antibody (Anti-HBe):
- Seroconversion from HbeAg positive to Anti-HBe indicates response to treatment
- Usually either the HbeAg is positive and the Anti-HBe is negative or the HbeAg is negative and the Anti-HBe is positive.

Key summary of the most commonly asked hepatitis B serology that is a must know for the exam:
- *HBsAg positive – Infection acute or chronic*
- *HbsAg positive and HbeAg positive – Highly infectiousness*
- *HBsAg positive alone – Recent vaccination*
- *Anti-HBc positive – Past infection*

Let's be honest. Some of you may struggle with memorising this. So we have come up with a story to help you remember.

*John has been infected with hepatitis B (acute or chronic) making him feel sad and droop with exhaustion (in other words he starts to **"sag"** – Hb**sAg**). The viruses are **eag**er to spread (HB**eAg**)*

*Amy, on the other hand, who is a **H**arvard **B**usiness **S**chool (anti-**HBs**) graduate, knows better and has received her hepatitis B vaccinations.*

Q-7

A 49 year old man with known HIV presents with history of cough and shortness of breath. His CD4 count is measured at 350 mm^3. A chest x-ray was performed and shows lobar consolidation. He has a temperature of 38.1 C, a respiratory rate of 30 breaths/minute and a heart rate of 90 beats/minute. What is the SINGLE most likely causative organism?

A. Mycobacterium avium intracellulare
B. Cytomegalovirus

C. **Streptococcus pneumoniae**
D. **Toxoplasmosis**
E. **Pneumocystic jiroveci**

ANSWER:
Streptococcus pneumoniae

EXPLANATION:
This is another debatable topic. At first, the impression that is given in the stem points towards Pneumocystis jiroveci given the history of cough and a HIV-positive patient. Pneumocystis jiroveci is obviously the most common opportunistic infection in HIV positive patients. However, one must remember that Pneumocystis jiroveci tends to affect HIV-positive patients who have a CD4 count below 200 cells/mm^3. For this reason, all patients with a CD4 count < 200/mm^3 should receive Pneumocystis jiroveci prophylaxis. While it is true that Pneumocystis jiroveci can also infect a HIV positive patient with a CD4 count above 200 cells/mm^3, it is less likely compared to Streptococcus pneumoniae.

The chest X-ray findings also point more towards Streptococcus pneumoniae as the causative organism. Remember that Streptococcus pneumoniae is the most common causative organism of lobar pneumonia and it accounts for around 80% of cases of community acquired pneumonia (CAP). Note that, HIV infection is also a risk factor for Streptococcus pneumoniae infections.

Q-8

A 41 year old lady is suffering from fever, sore throat and loss of appetite. Her symptoms have been persistent and worsening over the past few weeks. She has had a recent renal transplant and is currently on immunosuppressive medication. Serology was taken for toxoplasmosis and has returned with the presence of IgE antibodies which is interpreted as having a recent acquired infection. Her renal function is satisfactory. What is the SINGLE most appropriate treatment?

A. **Pyrimethamine**
B. **Pyrimethamine + sulfadiazine**
C. **Clindamycin**
D. **Spiramycin**
E. **Trimethoprim + sulfamethoxazole**

ANSWER:
Pyrimethamine + sulfadiazine

EXPLANATION:
Patients who are immunocompetent require treatment if symptoms of toxoplasmosis are severe and persistent.

Pyrimethamine is the most effective agent for toxoplasmosis infections. This is given in

combination with sulfadiazine. Sometimes clindamycin is used instead of sulfadiazine.

Q-9

A 33 year old man presents with an erythematous patch on his thigh, which has been enlarging in the last few days. He went for a camping trip a week ago. He has no allergies to any known medication. He is otherwise asymptomatic. What is the SINGLE most appropriate management?

A. Erythromycin
B. Doxycycline
C. Penicillin
D. Amoxicillin
E. Ceftriaxone

ANSWER:
Doxycycline

EXPLANATION:
Lyme disease
Lyme disease is caused by the spirochaete Borrelia burgdorferi and is spread by ticks (Ixodes scapularis tick)

Tick needs at least 24 hours of attachment to transmit the Borrelia burgdorferi organism.

Clinical presentation
Symptoms begin 3-30 days after the bite of the tick. Eighty percent of patients develop the erythema migrans rash at the site of the bite. (An erythematous patch, which may enlarge in the first few days) Even without treatment, the rash resolves in several weeks. A flu like illness with fever, chills, and myalgias occurs in half of patients.

Neurologic symptoms develop several weeks later. This is most commonly paralysis of the seventh cranial nerve (facial paralysis) and may be bilateral. Meningitis, and encephalitis may develop as well.

Cardiac symptoms develop a minority of people and is most commonly an AV heart block or Myocarditis

Joint involvement may develop but this is months to years later

Investigation
Serology: antibodies to Borrelia burgdorferi

Management
• Doxycycline if early disease. Amoxicillin is an alternative if doxycycline is contraindicated (e.g. pregnancy)
• Ceftriaxone if disseminated disease

Q-10

A 55 year old man has auricular pain and tinnitus on his left ear. On inspection, a painful vesicular rash around the auditory canal is noted. He also has decreased hearing on the left ear. What is the SINGLE most likely diagnosis?

A. **Acute mastoiditis**
B. **Cholesteatoma**
C. **Ramsay Hunt syndrome**
D. **Herpes zoster ophthalmicus**
E. **Otitis media with effusion**

ANSWER:
Ramsay Hunt syndrome

EXPLANATION:
Ramsay Hunt syndrome
Ramsay Hunt syndrome (herpes zoster oticus) is caused by the reactivation of the varicella zoster virus in the geniculate ganglion of the seventh cranial nerve.

Features
• Auricular pain is often the first feature
• Facial nerve palsy (ipsilateral facial palsy, loss of taste)
• Painful vesicular rash around the ear on the auditory canal
• Vertigo and tinnitus
• Ipsilateral hearing loss

Management
• Oral acyclovir and corticosteroids are usually given
• For herpetic neuralgia, give amitriptyline for the pain

Q-11

A 33 year old male patient presents with white patches in the mouth that can be wiped off and is easily removed leaving behind a red base which is painless. He has cracks at the corners of his mouth. What is the SINGLE most likely diagnosis?

A. **Kaposi's sarcoma**
B. **Molluscum contagiosum**
C. **Cytomegalovirus infection**
D. **Oral thrush**
E. **Leukoplakia**

ANSWER:
Oral thrush

EXPLANATION:
This is typical for oral candidiasis. White patches in the mouth which can be easily removed, leaving an underlying red base that is usually painless.

PSEUDOMEMBRANOUS ORAL CANDIDIASIS (ORAL THRUSH)

- Curd-like white patches in the mouth
- White pseudomembrane can be easily removed, leaving an underlying red base that is usually painless (in contrast with leukoplakia, which cannot be rubbed off)
- Cracks can occasionally be seen at the corners of the mouth

Predisposing factors

- Inhaled corticosteroids – risk can be decreased by using large volume spacer or mouthwash after use.
- Diabetes mellitus
- Recent use of broad spectrum antibiotics
- Elderly with false teeth

Treatment

- Oral fluconazole
- NICE CKS recommends using miconazole oral gel as first line or nystatin suspension if infection is mild and localized

Q-12

A 73 year old woman living in a nursing home, presents with rashes on her finger webs and also at her axillary folds. She complains of itching which is more severe at night. What is the SINGLE most appropriate mananagement?

A. 0.5% permethrin
B. Doxycycline
C. 5% permethrin
D. Aciclovir
E. Malathion 0.5%

ANSWER:
5% permethrin

EXPLANATION:
In PLAB, when you see an elderly living in a nursing home with rashes, think of scabies

Permethrin 5% is probably the only treatment that would be asked in PLAB for scabies

Scabies
Scabies is a parasitic skin infection characterized by superficial burrows, intense pruritus, and secondary infections

Aetiology
Sarcoptes scabiei. Transmitted by skin-to-skin contact.

Clinical Findings

- Pruritus, burrows, papules, commonly found on flexor surfaces of wrists, finger webs, elbows, axillary folds, areola of the breast in women, and genitals of the males. Scabies digs into the skin at the skin folds.
- Patients who are immunocompromised or debilitated may develop a severe form of scabies called Norwegian scabies (crusted scabies). These patients present with diffuse cutaneous involvement with crusting and malodorous discharge.

Treatment
- Scabies treatment is with permethrin 5% which is first-line
- (malathion 0.5% is second-line)
- Note: all household and close physical contacts should be treated at the same time, even if asymptomatic

Q-13

A 75 year old woman has weakness of the left side of her face and pain deep within the left ear. The ear pain was paroxysmal at first but after a day it became constant and radiates into the pinna. Now she says she hears ringing in her left ear. A mild left hearing loss was noted. There are blisters on the skin of the ear canal and auricle. What is the SINGLE most likely diagnosis?

A. Chronic serous otitis media
B. Herpes zoster oticus
C. Herpes simplex infection
D. Viral labyrinthitis
E. Bell's palsy

ANSWER:
Herpes zoster oticus

EXPLANATION:
Please see Q-10

Q-14

A 12 month old child who is HIV positive is due for his measles, mumps, and rubella (MMR) vaccine. His CD4 count is more than 800 cells/mL. What is the SINGLE most appropriate action?

A. Defer immunization for 2 weeks
B. Advise not to have MMR vaccine
C. Administer half dose of MMR vaccine
D. Administer paracetamol with MMR vaccine
E. Proceed with administration of MMR vaccination

ANSWER:
Proceed with administration of MMR vaccine

EXPLANATION:
Even though measles, mumps, and rubella (MMR) vaccine contains live attenuated viruses, it is sometimes recommended for people like HIV/AIDS. It is contraindicated if

the patient is severely immunocompromised including a HIV-infected patient with CD4 counts less than 200 cells/mL (or less than 750 cells/mL inb children).

Q-15

A 38 year old woman recently returned from Bangkok. She did not have any malaria prophylaxis before leaving the UK on her trip. She presents with a high fever, generalized macular blanching rash, tender and swollen cervical lymphadenopathy and generalized myalgia. What is the SINGLE most likely diagnosis?

A. **Cerebral Malaria**
B. **Dengue fever**
C. **Typhoid**
D. **Diphtheria**
E. **Lymphoma**

ANSWER:
Dengue fever

EXPLANATION:
In PLAB 1, these are the most important epidemiology points that you need to know for infectious diseases

• Malaria: Africa
• Dengue fever: Far East Asia
• Typhoid: South America
• Diphtheria: India

Even if you did not know this, the signs and symptoms point toward dengue fever. Here is a summarised list of the presentation of these diseases. Remember to tie in the signs and symptoms with the travel history:
• Malaria: fever, chills, rigors
• Dengue Fever: generalised rash, biphasic fever, retro-orbital pain
• Typhoid: severe headache, patients adopt a crouching position
• Diphtheria: presents with flu-like symptoms initially, enlarged anterior cervical lymph nodes

Q-16

A 45 year old man has developed an annular rash with a scaly edge on his thigh. The rash has been spreading over the last 3 weeks. He also complains of general aches and pains. What is the SINGLE most appropriate investigation?

A. **Antinuclear antibodies**
B. **Biopsy of the lesion**
C. **Skin scrap for mycology**
D. **Antibodies to Borrelia recurrentis**
E. **Antibodies to Borrelia burgdorferi**

ANSWER:
Antibodies to Borrelia burgdorferi

EXPLANATION:
The rash described is one of Lyme disease.

Q-17

An 8 week infant has been diagnosed as HIV positive. What is the SINGLE most appropriate immunization plan for the infant?

A. **Avoid MMR vaccinations and tetanus vaccinations**
B. **Administer all vaccines as scheduled except live attenuated vaccines**
C. **Administer only BCG vaccine**
D. **Administer all vaccines as scheduled except BCG vaccine**
E. **Avoid influenza vaccinations**

ANSWER:
Administer all vaccines as scheduled except BCG vaccine

EXPLANATION:
BCG should not be given to HIV positive patients. All other vaccinations can be given. MMR vaccinations should not be given if the CD4 count is below 200 cells/mL (or 750 cells/mL according to age-appropriate CD4 count by Children's HIV association). As the question stem does not state the CD4 count, administering all vaccines as scheduled except BCG vaccine is most appropriate.

There are debates around avoiding live immunisation for HIV in children however it is best to follow the guidelines from the Children's HIV Association (CHIVA)

The two vaccines that HIV positive patients should NOT have (regardless of CD4 count) are:

- *BCG*
- *Yellow fever*

Q-18

A 32 year old man has recently been to Thailand and returned with a sore throat, cervical lymphadenopathy, malaise and a mild fever. On examination of the throat, there is whitish exudate covering the tonsils. What is the SINGLE most likely infectious agent causing his symptoms?

A. **Human immunodeficiency virus (HIV)**
B. **Treponema pallidum**
C. **Salmonella typhi**
D. **Measles**
E. **Epstein-Barr virus**

ANSWER:

Epstein-Barr virus

EXPLANATION:
Sore throat and cervical lymphadenopathy are some of the main features of infectious mononucleosis.

If this was a HIV infection, there would be more of a generalized lymphadenopathy.

Infectious Mononucleosis
Infectious mononucleosis (glandular fever) is caused by the Epstein-Barr virus (also known as human herpesvirus 4, HHV-4). It is most common in adolescents and young adults.

Features
- Sore throat; tonsillar enlargement is common, classically exudative and may be massive
- Palatal petechiae
- Lymphadenopathy, especially neck glands
- Pyrexia
- Malaise
- Splenomegaly - may rarely predispose to splenic rupture
- A maculopapular, pruritic rash develops in around 99% of patients who take ampicillin/amoxicillin whilst they have infectious mononucleosis. Thus, they should not be given in any patient who might have infectious mononucleosis.

Diagnosis
- heterophil antibody test (Monospot test) (Paul Bunnell)

Other investigations:
- FBC
  - raised white cell count with lymphocytosis and a relative atypical lymphocyte count greater than 20%
  - ESR is elevated

Management is supportive
Simple analgesia for any aches or pains

Q-19

A 55 year old immunocompromised patient presents with dysphagia and pain on swallowing. He has a redness, fissuring and soreness at the angle of his mouth. What is the SINGLE causative organism?

A. Human herpesvirus 8
B. Molluscum contagiosum
C. Cytomegalovirus
D. Candida
E. Toxoplasma gondii

ANSWER:
Candida

EXPLANATION:
Angular cheilitis

- Redness, fissuring and soreness at the angle of the mouth.
- It can be due either to Candida spp. or to bacterial infection (mainly S. aureus)
- Contributing factors are older age, ill-fitting dentures, immunocompromised, vitamin B12 deficiency or iron-deficiency anaemia

Q-20

A 4 year old child is brought by his parents with a clean wound on his leg. He has never been immunised as his parents were worried about the side effects of the immunisations in the past. There are no contraindications to immunisation and the parents of the child are now open to the idea. The child's parents would like advice on the best method to reduce risk of infections. What is the SINGLE most appropriate action?

A. Offer full course of diphtheria, pertussis, tetanus (DTP) vaccine
B. Offer rabies immunisation
C. Offer 1 single injection diphtheria, pertussis, tetanus (DTP) vaccine
D. Offer intramuscular tetanus immunoglobulins
E. Offer oral antibiotics

ANSWER:
Offer full course of diphtheria, pertussis, tetanus (DTP) vaccine

EXPLANATION:
A full course of DPT vaccine would be appropriate to prevent tetanus in future. Children aged under 10 years if miss the vaccine can resume the schedule with the primary immunisation (first 3 doses). There should be a minimum for one month in between doses of the vaccine. This is then followed by the first booster immunisation which is 3 years after primary immunisation in children under 10 years of age. The second booster immunisation is given 10 years after the first booster.

TETANUS PROPHYLAXIS
Tetanus vaccine is currently given in the UK as part of the routine immunisation schedule at:

- 2 months
- 3 months
- 4 months
- 3-5 years
- 13-18 years

If high-risk wound – Give intramuscular tetanus immunoglobulin irrespective of whether 5 doses of tetanus vaccine have previously been given.

If incomplete or unknown vaccination – Give complete course of tetanus vaccine

What is considered a high risk wound?

- Wounds contaminated with soil
- Compound fractures
- Wounds containing foreign bodies
- Wounds or burns in people with systemic sepsis

In the UK, after the 5th dose of tetanus vaccine, immunity is considered for life and you do not need any further boosters. If the immunisation schedule is up to date or whose status is unknown, a reinforcing dose of tetanus vaccine (Revaxis 0.5 ml IM) is administered at time of treatment of injury and further doses to complete the recommended 5 dose schedule.

In adults who have not been immunised as a child, the primary course of tetanus vaccines, which is the first three doses can be given one month apart. This is followed by the 4th dose 10 years after the primary course and the 5th dose yeaers after the 4th dose.

Q-21

A 26 year old woman presents to her GP with a headache, photophobia and a fever. On examination, a generalized rash that does not blanch on pressure was observed. What is the SINGLE most appropriate initial management?

A. IM benzylpenicillin
B. Isolate the patient
C. Blood culture
D. IV Gentamicin
E. IV Ceftriaxone

ANSWER:
IM benzylpenicillin

EXPLANATION:
She has signs of meningitis but she presented to her GP thus benzylpenicillin IM (or IV) would be the correct answer. If you suspect meningitis and patient is not yet in the hospital give IM benzylpenicillin and send patient to the hospital urgently.

In a hospital setting, give intravenous third generation cephalosporin antibiotics (ceftriaxone or cefotaxime)

If this exact same question was given, but there was a diagnosis of Listeria, then IV amoxicillin and gentamicin would be the correct answer.

If this exact same question was given, but she is penicillin or cephalosporin allergic, then chloramphenicol would be the answer. If the patient has a history of immediate hypersensitivity reaction to penicillin or to cephalosporins the BNF recommends using chloramphenicol.

Investigations
Generally, treatment for meningitis should be started before doing any investigations due to the seriousness of the disease.

Rash
If patient has got a rash, then perform blood culture as the diagnosis is most likely meningococcal septicaemia. The causative organism is Neisseria meningitides.

If there is no rash then a lumbar puncture would be a better answer, but this can only be done if there are no signs of raised intracranial pressure (ICP). Patients with increased ICP from mass lesions often display decreased levels of consciousness, focal neurological signs or papilloedema on physical exam.

Management of contacts
Prophylaxis (oral ciprofloxacin or rifampicin) needs to be offered to household and close contacts of patients affected with meningococcal meningitis

Summary
Pre-hospital setting + Suspect meningococcal disease → IM benzylpenicillin
Hospital setting + Suspect meningococcal disease →IV cefotaxime
Meningitis caused by listeria → IV amoxicillin and gentamicin
Hypersensitivity reaction to penicillin or cephalosporins → chloramphenicol
Prophylaxis to close contact (meningococcal meningitis) → oral ciprofloxacin or rifampicin

Q-22

A 15 year old boy had a patchy rash over his body following antibiotic treatment for sore throat. On examination, he has cervical lymph node enlargement and mild splenomegaly which is tender on palpation. What is the SINGLE most likely antibiotic that would have caused the rash?

- **A. Ampicillin**
- **B. Erythromycin**
- **C. Cefuroxime**
- **D. Metronidazole**
- **E. Tetracycline**

ANSWER:
Ampicillin

EXPLANATION:
A maculopapular, pruritic rash develops in around 99% of patients who take ampicillin/amoxicillin whilst they have infectious mononucleosis.

Q-23

A 33 year old man has complaints of dysuria and three tender penile ulcers. He is sexually active and does not use any protection. What is the SINGLE most likely diagnosis?

A. **Chlamydia infection**
B. **Gonorrhoea infection**
C. **Primary syphilis**
D. **Trichomoniasis**
E. **Herpes infection**

ANSWER:
Herpes infection

EXPLANATION:
Genital herpes simplex which is caused by herpes simplex virus may present with painful multiple ulcers and also dysuria.

Syphilis ulcers are usually painless and thus is not the correct answer.

GENITAL HERPES
May be asymptomatic or may remain dormant for months or even years. When symptoms occur soon after a person is infected, they tend to be severe. They may start as multiple small blisters that eventually break open and produce raw, painful sores that scab and heal over within a few weeks. The blisters and sores may be accompanied by flu-like symptoms with fever and swollen lymph nodes. Often also accompanied by dysuria.

Genital herpes can be a chronic, lifelong infection. Majority of cases are caused by HSV-2 (HSV-1 is taking over). In the UK, HSV-1 is the commonest cause of genital herpes too. Historically, HSV-1 was known for its orolabial herpes (cold sores) and HSV-2 for its genital herpes. But now, HSV-1 is the most common cause of both orolabial herpes and genital herpes in the UK.

Signs:
Flu-like prodrome, then grouped vesicles/papules develop around genitals. These burst, and form shallow ulcers.

Management:
Oral aciclovir. Some patients with frequent exacerbations may benefit from longer term acyclovir

Just for laughs
What's the difference between love and herpes?
Herpes lasts forever

Q-24

A 34 year old man who has a new diagnosis of haematological malignancy presents in the emergency department with bruises all over his abdomen. He has a temperature of 38.6 C. His respiratory rate is 25 breaths/minute, heart rate is 102 beats/minute and blood pressure is 80/50 mmHg. His blood results show:

White cell count 23 x 10^9/L
Neutrophils 0.4 x 10^9/L

He is commenced on meropenem. What is the SINGLE most likely diagnosis?

A. **Septic shock**
B. **Neutropenic sepsis**
C. **Hepatitis**
D. **Cytomegalovirus**
E. **HIV**

ANSWER:
Neutropenic sepsis

EXPLANATION:
A temperature more than 38 C and neutrophil count of less than 0.5 x 10^9/L defines neutropenic sepsis

NEUTROPENIC SEPSIS
Neutropenic sepsis is a potentially fatal complication of anticancer treatment (particularly chemotherapy).
Febrile neutropenia is defined as:
• An oral temperature ≥38.5°C or two consecutive readings of ≥38.0°C for two hours and
• An absolute neutrophil count ≤0.5 x 109/L

Febrile neutropenia should also be suspected in:
• Recipients of chemotherapy within the last 4 weeks – *Chemo is the most common cause of neutropenic sepsis*
• Recipients of bone marrow transplant within the last year who are febrile

General Management for Neutropenic Sepsis
• Antibiotics must be started immediately (do not wait for the WBC)
• NICE recommend starting empirical antibiotic therapy with piperacillin with tazobactam (Tazocin) immediately
• if patient is still febrile and unwell after 48 hours → an alternative antibiotic such as meropenem is often prescribed +/- vancomycin
• if patient is not responding after 4-6 days → order investigations for fungal infections, rather than just starting antifungal therapy blindly

Patient unwell + recent – Start intravenous broad spectrum antibiotics! Don't wait!

Q-25

A 24 year old man presents with a deep penetrating wound on his foot after having stepped on a nail in a field. The wound is deep. He does not remember if he had tetanus vaccines when he was a child. What is the SINGLE most appropriate management to be given?

A. **Tetanus immunoglobulins only**
B. **Tetanus immunoglobulins and complete course of tetanus vaccine**
C. **Complete course of tetanus vaccine**
D. **Tetanus booster vaccine only**
E. **Antibiotic**

ANSWER:
Tetanus immunoglobulins and complete course of tetanus vaccine

EXPLANATION:
If uncertain history of previous vaccination and high risk wound (like in this case), give vaccine and tetanus immunoglobulin (TIG). This should be a complete course of 5 doses.

Q-26

A 16 year old girl has a sore throat. She feels tired and weak. Oropharyngeal examination shows tonsillar enlargement which is exudative. Her GP prescribed her amoxicillin after which she developed a pruritic rash. What is the SINGLE most likely diagnosis?

A. **Infectious mononucleosis**
B. **Kawasaki disease**
C. **Lymphoma**
D. **Cytomegalovirus**
E. **Group A streptococcal pharyngitis**

ANSWER:
Infectious mononucleosis

EXPLANATION:
A maculopapular, pruritic rash develops in around 99% of patients who take ampicillin/amoxicillin whilst they have infectious mononucleosis.

Q-27

A 16 year old girl attends clinic with a sore throat and palatal petechiae. A full blood count was done which shows:

Haemoglobin 109 g/L
White cell count 25 x 10^9/L
Platelets 88 x 10^9/L

A Paul Bunnell test was shown to be positive. What is the SINGLE most likely diagnosis?

A. **Glandular fever**
B. **Idiopathic thrombocytopenic purpura (ITP)**
C. **Measles**
D. **Rubella**
E. **Thrombotic thrombocytopenic purpura (TTP)**

ANSWER:
Glandular fever

EXPLANATION:
The clincher here is the positive Paul Bunnell test which is only seen in infectious mononucleosis (Glandular fever). The rest of the symptoms fit perfectly as well. Palatal petechiae and sore throat can occur with infectious mononucleosis. WBCs are classically high and the anaemia is secondary to cold agglutinins (IgM).

Q-28

A 35 year old lady presents with recurrent extremely painful ulcers on her vulva. Viral culture and DNA detection using polymerase chain reaction (PCR) of a swab from the ulcer has come back as negative. What is the SINGLE most appropriate investigations which will lead to the diagnosis?

A. **Anti-HSV antibodies**
B. **Dark ground microscopy of the ulcer**
C. **Treponema pallidum antibody test**
D. **Rapid plasma reagin test**
E. **Venereal Disease Research Laboratory test (VDRL)**

ANSWER:
Anti-HSV antibodies

EXPLANATION:
The probable diagnosis here is Genital Herpes Simplex. Usually Viral culture and DNA detection using polymerase chain reaction (PCR) of a swab from the base of an ulcer are used to diagnose genital herpes. In fact, now NAAT testing is the preferred diagnostic modality above PCR-based methods but both NAAT testing and PCR based methods are more sensitive than viral culture.

Anti-HSV antibodies are only used in certain scenarios. One of them is if there are recurrent/atypical genital ulcers with negative culture or PCR results.

Remember, serum HSV-specific antibodies should not be routine as this blood test cannot reliably differentiate between a recent or a previous infection. It may be helpful in specific situations like in this case.

Q-29

A 54 year old smoker presents to Accident & Emergency with the complaint of a productive cough. He says that he coughs up about a tablespoon full of yellow sputum every day. He also complains of chest tightness and mentions noticing a fever as well. These symptoms have been present for the past 5 days. He smokes two packs of cigarettes per day and has been smoking for the past 20 years. Physical examination reveals the presence of herpes labialis on the patient's lower lip. The patient's observations are as follows:

Temperature 38.7 C
Blood pressure 150/95 mmHg
Heart rate 95 beats per minute
Respiratory rate 20 breaths per minute
Oxygen saturation 96% on room air.

Auscultation of his chest reveals breath sounds that are distant but clear with crackles heard at the right lung base. A chest X-ray that was subsequently done reveals a right lower zone consolidation. What is the SINGLE most likely organism responsible for causing pneumonia in this patient?

A. **Gram positive diplococci**
B. **Gram negative diplococci**
C. **Legionella**
D. **Pneumocystic carinii**
E. **Pseudomonas**

ANSWER:
Gram positive diplococci

EXPLANATION:
This patient has the typical symptoms of pneumonia as well as the presence of herpes labialis. That, in addition with the consolidation seen on the chest X-ray, is very suggestive of a streptococcal infection which is a gram positive diplococci (found in pairs). Streptococcus pneumoniae is the commonest bacterial pneumonia and one of the clinical features that separates it from the rest of pneumonias is herpes labialis.

Q-30

A 36 year old Jewish man presents with multiple purple papular lesions on his face and upper trunk measuring 1-2 cm across. It has been slowly growing over the last couple of years. It is not painful or itchy. What is the SINGLE most likely diagnosis?

A. **Kaposi's sarcoma**

B. Hairy leukoplakia
C. Cryptosporidium
D. Cytomegalovirus infection
E. Cryptococcal infection

ANSWER:
Kaposi's sarcoma

EXPLANATION:
Kaposi's sarcoma
Kaposi's sarcoma (KS) is a connective tissue cancer caused by human herpesvirus 8 - now called Kaposi's sarcoma-associated herpesvirus (KSHV). The malignant lesion is characterised by neoplastic cells and abnormally growing blood vessels. KS is different to other neoplasms by virtue of the fact that lesions may begin in more than one place at the same time.

Types of Kaposi's sarcoma:
1. Classic: especially elderly Jewish or Mediterranean man. It is rare and progresses slowly over years.
2. Endemic or African KS: affects young adult men who live near the African equator and have a normal immune system.
3. KS in immunosuppression: Aggressive course with visceral involvement.
4. AIDS related: May be life-threatening with many skin, gut and lung lesions. It affects mostly homo- or bisexual men

Presentation
- Skin lesions may be nodular, papular or blotchy; they may be red, purple, brown or black.
- Lesions can also be seen under or on mucous membranes, with similar characteristics.
- The most common sites include the mouth, nose and throat.
- Usually painless but may become painful if inflamed or swollen.
- Lesions may also involve internal organs - eg, lungs (leading to dyspnoea), gastrointestinal tract (it can cause fatal bleeding) and lymphatics, resulting in lymphoedema

Q-31
A 35 week pregnat woman presents to the Antenatal Day Unit with productive cough and rigors. This is her first pregnancy and there have been no issues to date. She returned from Uganda two weeks ago from a family visit. She is suspected to have respiratory tuberculosis. What is the SINGLE most likely medication that should not be used in pregnancy?

A. Ethambutol
B. Pyrazinamide
C. Streptomycin

D. Isoniazid
E. Rifampicin

ANSWER:
Streptomycin

EXPLANATION:
The standard unsupervised six month treatment regimen may be used during pregnancy. Streptomycin should not be used in pregnancy because it has been shown to have harmful effects on the fetus.

This patient should be treated as the risks of untreated tuberculosis are greater to pregnancy than the medication. The risk towards the pregnancy are perinatal infection, low birth weight or growth retardation, and premature delivery. Treatment for tuberculosis is the same for pregnant and non-pregnant status: 4 drug therapy (Isoniazid, Rifampicin, Pyrazinamide, Ethambutol).

Q-32

A 36 year old lady with Hodgkin's lymphoma has chemotherapy 8 days ago. She presents with a temperature of 39.5 C and left sided abdominal pain. Her pulse rate is 96 beats/minute. Full blood count was sent and bloods were taken for culture. What is the SINGLE most appropriate next action?

A. Wait for results of culture and sensitivity to confirm antibiotic choice
B. Wait for results of full blood count to determine further management
C. Start oral antibiotics immediately
D. Start broad spectrum IV antibiotics immediately
E. Start IV fluids only

ANSWER:
Start broad spectrum IV antibiotics immediately

EXPLANATION:
There are clear signs of infection with risk that the patient could be having neutropenic sepsis thus broad spectrum IV antibiotic should be started empirically while waiting for blood reports

There are 2 main reasons neutropenia is seen in lymphoma:

1. Lymphoma in the bone marrow
• If lymphoma cells are in the bone marrow, they take up space that is normally used to produce healthy blood cells which can lead to neutropenia.

2. Side effects of treatment
• Although the aim of treatment is to kill the lymphoma cells, a side effect of many types of chemotherapy, and some radiotherapy treatments (eg radiotherapy to the pelvis), is

that some healthy cells are also destroyed. This may include blood cells that are developing in the bone marrow.
- Depending on the strength of your chemotherapy regimen, neutropenia is most commonly seen 10 to14 days after chemotherapy

Q-33

A 25 year old woman presents with a painful shallow ulcer on the vulva. It is associated with painful inguinal lymphadenopathy. She is sexually active. What investigation is likely to identify the cause of the ulcer.

A. Herpes simplex virus (HSV) antibodies
B. Syphilis serology
C. Swab for haemophilus ducreyi
D. Urine culture
E. Blood culture

ANSWER:
Swab for haemophilus ducreyi

EXPLANATION:
A single painful ulcer is likely to be Chancroid (in the PLAB exam), caused by Haemophilus ducreyi. The pain inguinal lymphadenopathy is also typical. *As the saying goes, "You do cry with ducreyi".*

Primary syphilis typically causes a painless ulcer (chancre)

Herpes simplex virus (HSV) leads to several inflamed papules and vesicles. It would be uncommon to have a single ulcer. In addition, the presence of HSV antibodies does not confirm the diagnosis (only past exposure), as many patients will acquire the infection but remain asymptomatic.

Blood and urine cultures are not required.

Q-34

A 7 year old school boy has been diagnosed with meningococcal meningitis. What is the SINGLE most appropriate prophylactic management?

A. Prophylactic rifampicin for the family
B. Prophylactic IV cefotaxime for family
C. Meningococcal vaccine for the family
D. Prophylactic benzylpenicillin for family
E. No prophylaxis needed

ANSWER:
Prophylactic rifampicin for the family

EXPLANATION:

Meningococcal Prophylaxis

Prevention of secondary case of meningococcal meningitis is with rifampicin or ciprofloxacin. It is usually given to all intimate, household or daycare contacts who have been exposed to the patient within 10 days of onset.

Q-35

A 74 year old female presents with headache and neck stiffness to the emergency department. Following a lumbar puncture, the patient was started on IV ceftriaxone. CSF culture reports as having Listeria monocytogenes. What is the SINGLE most appropriate treatment?

A. **Add IV amoxicillin**
B. **Change to IV ampicillin + gentamicin**
C. **Add IV ciprofloxacin**
D. **Add vancomycin**
E. **Continue IV ceftriaxone as monotherapy**

ANSWER:

Change to IV ampicillin + gentamicin

EXPLANATION:

The therapy after identificantion of Listeria monocytogenes in CSF is ampicillin 2 g 4 hourly + gentamicin 5 mg/kg divided into 8-hourly doses.

Q-36

A 13 year old girl complains of a 3 day history of hoarseness of voice associated with dry cough. She presents with a fever and malaise. On direct laryngoscopy, her vocal cords are seen to be grossly oedematous. What is the SINGLE most appropriate investigation?

A. **None required**
B. **Sputum for acid-fast bacilli**
C. **Blood culture**
D. **Cervical spine x-ray**
E. **Bronchoscopy**

ANSWER:

None required

EXPLANATION:

This is likely a case of a common cold. No further investigations or management is required.

Q-37

A 20 week pregnant lady presents with intermittent fever, coughs, headaches, myalgia, gastric upset and mild confusion. She arrived from Ghana 12 days ago.

She travelled there to visit her family. Before she left, she was prescribed chloroquine and proguanil and she took it as prescribed starting 1 week before entering Ghana. She is still taking chloroquine and proguanil as her doctor had asked her to continue it for 4 weeks after arriving in the United Kingdom. On examination, she has a yellowish tinge on her skin. What is the SINGLE most likely diagnosis?

A. **Malaria**
B. **Hepatitis**
C. **Dengue**
D. **Influenza**
E. **Side effects of medication**

ANSWER:
Malaria

EXPLANATION:
This lady has been taking malaria chemoprophylaxis but it is important to note that Malaria can still occur in people even though they take Malaria chemoprophylaxis. Chloroquine and proguanil can be used in pregnancy but these drugs are not appropriate for most areas because their effectiveness has declined, particularly in Sub-Saharan Africa.

Key message: Chloroquine and proguanil are safe in pregnancy, but they are no longer efficacious in areas of chloroquine resistance.

Mefloquine is now the drug of choice and recommended by the Royal College of Obstetricians and Gynaecologists (RCOG) for prophylaxis in pregnant woman in the second and third trimester traveling to chloroquine-resistant areas.

Evidence also suggests that pregnant women are twice as likely as non-pregnant women to be bitten by anopheline mosquitoes which is the reason we should encourage women not to travel to areas with malaria.

Clinical features that are seen with Malaria include:
• Intermittent fevers
• Chills
• Rigors
• Headache
• Cough
• Myalgia
• Gastrointestinal upset
• Splenomegaly
• Hepatomegaly

• Jaundice

Q-38

A 5 year old boy was brought to his GP with a temperature of 38.8 C and numerous pruritic vesicles on his chest and back. They appear in circular crops and initially started on his face before spreading to his chest and back. What is the SINGLE most appropriate management?

A. Intravenous aciclovir
B. Oral aciclovir
C. Oral antibiotics
D. Topical steroids
E. Reassurance

ANSWER:
Reassurance

EXPLANATION:
The diagnosis here is chicken pox. The management here would involve reassurance, and supportive management like paracetamol for the fever, antihistamine and calamine lotion for the pruritus.

There is no role of aciclovir in a healthy child or adult. Antibiotics are administered only in the case of superimposed infection.

Chickenpox
• Caused by primary infection with varicella-zoster virus. Reactivation of the dormant virus after a bout of chickenpox leads to herpes zoster (shingles)
• Highly infectious and its spread is via the respiratory route. Most chickenpox is mild to moderate and self-limiting but serious complications can occur in immunocompromised patients.

Infectivity → 4 days before rash and until 5 days after the rash first appeared
Incubation period → 10 to 21 days

Clinical features
• Pyrexia → Often the first feature
• Itchy, rash starting on head, chest and back before spreading
• Lesions are usually most concentrated on the chest and back
• Initially rash is macular → then papular → then vesicular → then dry crust
Clinical features tend to be more severe in adults

Management
• Pruritus → managed by sedating antihistamines and emollients. While some sources mention that calamine lotion is no longer recommended, as when it dries it ceases to be effective, it is still used and the advice that is given is to reapply it regularly
• Administer varicella zoster immunoglobulin (VZIG) to:

  - Immunocompromised with exposure or
  - Newborn with peripartum exposure or
  - Pregnant women with exposure and with no varicella antibodies
- Administer aciclovir to:
  - Pregnant women who develop chicken pox
  - Immunocompromised who develop chicken pox

Q-39

A 78 year old nursing home resident has intensely itchy rash. White linear lesions are seen on the wrists and elbows, and red papules are present on his penis. What is the SINGLE most appropriate management?

A. Topical permethrin
B. Referral to GUM clinic
C. Topical betnovate
D. Topical ketoconazole
E. Topical selenium sulfide hyoscine

ANSWER:
Topical permethrin

EXPLANATION:
In PLAB, when you see an elderly living in a nursing home with rashes, think of scabies

Permethrin 5% is probably the only treatment that would be asked in PLAB for scabies

Q-40

A 5 year old boy has a sudden onset of fever and bilateral swelling at the angles of the jaw. He has ear pain when he chews. The GP saw him yesterday for bilateral parotid pain and prescribed him paracetamol. He currently has a temperature of 38.8 C. What is the SINGLE most appropriate next step?

A. Corticosteroids
B. Antibiotics
C. Biopsy
D. Immediate surgery
E. Reassurance

ANSWER:
Reassurance

EXPLANATION:
Remember that there is no specific treatment for mumps but drugs such as paracetamol and ibuprofen may give symptomatic relief. In this case, reassurance is all that is needed. Mumps is a self limiting condition.

Mumps

- Mumps is an acute, generalised infection caused by a paramyxovirus, usually in children and young adults
- It can infect any organ but usually affects the salivary glands
- The virus is highly infectious with transmission by droplets spread in saliva via close personal contact
- Infected persons excrete the virus for several days before symptoms appear and for several days afterwards

Presentation

- Mumps can be asymptomatic
- Nonspecific symptoms lasting a few days, such as fever, headache, malaise, myalgia and anorexia, can precede parotitis
- Parotitis is usually bilateral although it can be unilateral
- Typically, there is pain at or near the angle of the jaw
- Fever may be as high as 39.5°C without rigors in small children
- Swelling causes distortion of the face and neck with skin over the gland hot and flushed but there is no rash
- With severe swelling, the mouth cannot be opened and is dry because the salivary ducts are blocked.
- Discomfort lasts for three or four days but may be prolonged when one side clears and the other side swells.
- Usually just the parotid glands are involved but, rarely, the submaxillary and sublingual salivary glands are affected

Orchitis

Orchitis may occur four or five days after the start of parotitis but it often appears without it. This can sometimes lead to the diagnosis being missed. Orchitis presents with chills, sweats, headache and backache with swinging temperature and severe local testicular pain and tenderness. The scrotum is swollen and oedematous so that the testes are impalpable.

Orchitis is usually unilateral but may be bilateral.

Q-41

A 33 year old known drug abuser has swelling and erythema in his arm where he injects. He has a fever and appears sick. He is asking for morphine as the pain is severe and seems to be disproportionate to the clinical appearance. Bullae is seen on the skin of his arm. He was started on intravenous flucloxacillin but the infection has not responded to antibiotics and seems to be worsening. What is the SINGLE most likely diagnosis?

A. Cellulitis
B. Erysipelas
C. Pyoderma gangrenosum
D. Penicillin allergic reaction
E. Necrotising fasciitis

ANSWER:
Necrotising fasciitis

EXPLANATION:
Necrotising fasciitis
Necrotising fasciitis is a life-threatening infection which rapidly spreads caused predominantly by group A β-haemolytic Streptococci,. It is defined as necrotising infection involving any layer of the deep soft tissue compartment (dermis, subcutaneous tissue, fascia or muscle).

Risk factors
- Intramuscular or subcutaneous drug injection
- Diabetes
- Immunosuppression

Presentation → According to days
- Day 1 to 2
  - Swelling, erythema, pain over affected area (mimics cellulitis)
  - Margins of infection are poorly defined, with tenderness extending beyond the apparent area of involvement (unlike cellulitis)
  - No response to antibiotics (unlike cellulitis)
- Day 2 to 4
  - Bullae, indicating skin ischaemia (unlike cellulitis)
  - Skin progresses to grey colour due to necrosis (unlike cellulitis)
  - Subcutaneous tissues have a wooden-hard feel (unlike cellulitis)
  - From intense pain to anaesthesia like pain → due to nerves being destroyed
- Day 4 to 5
  - Septic shock develops

As necrotising infection is deep within the skin and is not visible it is often difficult to diagnose. One important notable feature is if the pain is severe, and disproportionate to the physical signs, think necrotising fasciitis.

Q-42

A 33 year old lady was at high-risk for Hepatitis-B and was started on vaccination. After 2 injections, she was found to be pregnant. What is the most likely serological result during antenatal screening to suggest vaccine immunization?

A. **HbsAg-negative; anti HBc-negative; anti-HBs-negative**
B. **HbsAg-negative; anti HBc-positive; anti-HBs-positive**
C. **HbsAg-negative; anti HBc-negative; anti-HBs-positive**
D. **HbsAg-positive; anti HBc-positive; IgM anti-HBc-positive; anti-HBs-negative**
E. **HbsAg-positive; anti HBc-positive; IgM anti-HBc-negative; anti-HBs-negative**

ANSWER:
HbsAg-negative; anti HBc-negative; anti-HBs-positive

EXPLANATION:
HbsAg-negative; anti HBc-negative; anti-HBs-negative **(susceptible)**
HbsAg-negative; anti HBc-positive; anti-HBs-positive **(immune due to natural infection)**
HbsAg-negative; anti HBc-negative; anti-HBs-positive **(immune due to Hep-B vaccination)**
HbsAg-positive; anti HBc-positive; IgM anti-HBc-positive; anti-HBs-negative **(Acutely infected)**
HbsAg-positive; anti HBc-positive; IgM anti-HBc-negative; anti-HBs-negative **(Chronically infected)**

Q-43

A 5 year old child started having a fever two days ago associated with neck stiffness, chills, impaired consciousness and vomiting. He has a history of travel with his parents to Ghana and returned 6 weeks ago. Before he left to Ghana, he was started on malaria prophylaxis. A full blood count shows that the young child is anaemic. What is the SINGLE most likely diagnosis?

A. **Cerebral abscess**
B. **Cerebral malaria**
C. **Meningococcal meningitis**
D. **Subarachnoid haemorrhage**
E. **Cerebral tumour**

ANSWER:
Cerebral malaria

EXPLANATION:
Malaria prophylaxis does not provide full protection against all subtypes of malarial parasites.

The two top choices given here is cerebral malaria and meningococcal meningitis. The full blood count showing anaemia points towards cerebral malaria as the diagnosis rather than meningococcal meningitis.

Impaired consciousness is one of the signs of cerebral malaria. There are no specific symptoms of malaria so it is critical to consider the possibility of the diagnosis. Most missed malarial infections are wrongly diagnosed as nonspecific viral infections, influenza, gastroenteritis or hepatitis. Children, in particular, are more likely to present with nonspecific symptoms (fever, lethargy, malaise, somnolence) and to have gastrointestinal symptoms.

It is important to consider malaria in every febrile patient returning from a malariaendemic area within the last year, especially in the previous three months,

regardless of whether they have taken chemoprophylaxis, as prompt recognition and appropriate treatment will improve prognosis and prevent deaths.

Q-44

An 8 year old boy has red, itchy rash on his abdomen, face, arms and legs that has turned into fluid-filled blisters. A few days later they crusted over. What is the main mode of transmission of this condition?

A. **Airborne**
B. **Direct contact**
C. **Bloodborne**
D. **Vectorborne**
E. **Waterborne**

ANSWER:
Airborne

EXPLANATION:
The diagnosis here is chicken pox. It is caused by varicella-zoster virus. The mode of transmission of varicella zoster virus is mainly person-to-person by airborne respiratory droplets, but also occurs by direct contact with vesicle fluid of chickenpox cases or contact with the vesicle fluid of patients with herpes zoster.

Q-45

A 34 year old man from Zimbabwe is admitted with abdominal pain to the emergency department. An abdominal X-ray reveals bladder calcification and evidence of obstructive uropathy. What is the SINGLE most likely causative organism?

A. **Schistosoma mansoni**
B. **Sarcoidosis**
C. **Leishmaniasis**
D. **Tuberculosis**
E. **Schistosoma haematobium**

ANSWER:
Schistosoma haematobium

EXPLANATION:
Bladder involvement is caused by Schistosoma haematobium while Schistosoma mansoni is mainly responsible for intestinal forms of disease.

Urinary schistosomiasis (bilharzia)
This is caused by the parasitic trematode (or flatworm) called Schistosoma haematobium. It occurs in Africa (Egypt) and the Middle East.

An X-ray may show a calcified, contracted bladder and evidence of obstructive uropathy. An ultrasound in established disease may show hydronephrosis and a thickened bladder wall.

Complications
The two most important complications needed to know for the PLAB exam is
• Squamous cell carcinoma of the bladder → there can be a lag period of around 20 years between infection and the development of malignancy
• Bladder calcification, and ulceration

Q-46

A 33 year old lady who works at a nursing home presents with itching. On examination, linear tracks on the wrist are seen. She says that 2 days ago she had come in contact with a nursing home resident with similar symptoms. What is the SINGLE most likely mechanism of itching?

A. Infection
B. Destruction of keratinocytes
C. Allergic reaction
D. Intolerance
E. Decreased histamine

ANSWER:
Allergic reaction

EXPLANATION:
In scabies, pruritus develops as an allergic reaction to infection, around 4-6 weeks after infestation.

Most of the symptoms of scabies are due to your immune system's response to the mites, or to their saliva, their eggs or their poo (faeces). In other words, the rash and the itching are mostly caused by your body's allergic-like reaction to the mites, rather than the mites themselves.

Q-47

A 24 year old male has a history of urethral discharge and dysuria. He is sexually active with other men and has had four sexual partners in the last year. He does not practice safe sex. Urethral swabs were taken which results came back positive for chlamydia. What is the SINGLE most likely complication if left untreated?

ANSWER:
Epididymo-orchitis

EXPLANATION:
Chlamydia is the most prevalent sexually transmitted infection in the UK and is caused by Chlamydia Trachomatis.

Males tend to have either:
• Classical urethritis with dysuria and urethral discharge or
• Epididymo-orchitis presenting as unilateral testicular pain

Fever may also be a presenting feature in males

Q-48

A 23 year old homeless smoker has an ongoing productive cough. She takes recreational drugs and looks malnourished. She has lost 15 kg in the past year. There are severel nontender swellings on both sides of her neck. On examination, she has crackles in her right upper lobe but is otherwise well and stable. A chest X-ray reveals upper lobe infiltrates with cavitation on the right lung. What is the SINGLE most likely diagnosis?

A. Aspergillosis
B. Klebsiella pneumoniae
C. Pneumococcal pneumonia
D. Bronchogenic carcinoma
E. Tuberculosis

ANSWER:
Tuberculosis

EXPLANATION:
It is important to remember the risk factors of tuberculosis as well as how it presents.

Weight loss is seen in tuberculosis. One of the signs in tuberculosis is lymphadenopathy particularly cervical which is seen in this stem.

The examination findings and chest X-ray are consistent with almost every option given in the question. But only tuberculosis and lung cancer would have the associated weight loss. Given the age of only being 23, tuberculosis is the likely answer.

Risk factors for TB which are included in this stem are:
• Homeless
• Drug abuser
• Smoker

The reason for homeless and drug abusers being at risk of TB is that they often live in overcrowded areas and have poor housing which encourage the spread of TB. It is estimated that homeless are at 150 times at risk of TB than the UK average.

TUBERCULOSIS
Tuberculosis (TB) is an infection caused by Mycobacterium tuberculosis that most commonly affects the lungs.

Primary tuberculosis
• Primary infection of the lungs

• A small lung lesion known as a Ghon focus develops
• Primary infection is usually asymptomatic

Secondary (post-primary) tuberculosis
• Occurs if the host becomes immunocompromised the initial infection may become reactivated
• Presentation of secondary infection is variable and often nonspecific

Presentation
• Fatigue, malaise
• Chronic, productive cough
• Night sweats
• Weight loss

Diagnosis
• X-ray
  o Upper lobe infiltrates with cavitation
• Stain for Acid-Fast Bacilli (AFB)
• Culture is most specific but may take weeks
• Nucleic acid amplification test
  o Only performed as an additional test in specific scenarios such as if the patient has HIV, or rapid information about mycobacterial species would alter the management.

Do not use Mantoux test to diagnose acute cases of TB

Screening
• Mantoux testing → to diagnose latent tuberculosis infection
  o Used in people who are either household contacts, co-workers, or school contacts of patients with active tuberculosis
• Interferon Gamma testing
  o Used in patients who have had a bacillus Calmette-Guérin (BCG) vaccine. *This is because Mantoux test may be positive in patients who have had a BCG vaccine.*

Management of active tuberculosis
• Initial phase - first 2 months → *Mnemonic (RIPE)*
  o Rifampicin
  o Isoniazid
  o Pyrazinamide
  o Ethambutol

• Continuation phase - next 4 months
  o Rifampicin
  o Isoniazid

Mnemonic: *I saw a red pyre*
• ***I SA****w* - ***ISO****niazid*

• ***R**ed - **R**ifampicin*
• ***P**yr**E** - **P**yrazinamide, **E**thambutol*

Q-49

A 33 year old man comes from India with cough, fever and enlarged cervical lymph nodes. Histology reveals caseating granulomas found in the lymph nodes. What is the SINGLE most likely diagnosis?

A. Lymphoma
B. Tuberculous lymphadenitis
C. Thyroid carcinoma
D. Goitre
E. Thyroid cyst

ANSWER:
Tuberculous lymphadenitis

EXPLANATION:
Tuberculous lymphadenitis (or tuberculous adenitis) is a chronic specific granulomatous inflammation of the lymph node with caseation necrosis, caused by infection with Mycobacterium tuberculosis or Mycobacterium bovis.

Tuberculosis is responsible for up to 43 percent of peripheral lymphadenopathy in the developing world. In rural India, the prevalence of tuberculous lymphadenitis is significantly higher.

Q-50

A 33 year old man with Hodgkin's lymphoma has chemotherapy 9 days ago. He develops a temperature of 39.0 C and signs of a chest infection. Blood count shows:

Haemoglobin 113 g/L
White cell count 2.3 x 10^9/L
Neutrophils 0.8 x 10^9/L
Platelets 150 x 10^9/L

What is the SINGLE most likely management?

A. Co-amoxiclav
B. Piperacillin-tazobactam
C. Erythromycin
D. Piperacillin-Co-amoxiclav
E. Clarithromycin

ANSWER:
Piperacillin + tazobactam

EXPLANATION:
Piperacillin-Tazobactam may be used in the management of neutropenic patients with fever suspected to be due to a bacterial infection as in patient with post-chemotherapy neutropenia.

Q-51

A 4 year old girl is brought by her mother into the Paediatric Accidents & Emergency with a history of fever, headache and vomiting for the past 2 days. Her mother records her fever at home and says that her fever has not gone below 39 C for the past 24 hours. She is drowsy and difficult to wake up. She had a seizure causing twitching of the right side of the body at home for 4 minutes an hour ago. Her respiratory rate is 40 beats/minute, oxygen saturation is 90%, temperature is 39.2 C, and capillary refill time is 3 seconds. Her Glasgow Coma Scale is recorded as 11. During examination, she tends to turn away from any source of bright light. What is the SINGLE msot appropriate investigation that would lead to a diagnosis?

A. **Blood culture**
B. **Blood glucose**
C. **Chest X-ray**
D. **Computed tomography of head**
E. **CSF analysis**

ANSWER:
CSF analysis

EXPLANATION:
The fever, headache, vomiting and drowsiness are nonspecific but given there is absent history of symptoms of a urinary tract infection or respiratory infection, we should consider CNS involvement. The key phrase here is also photophobia which makes meningitis the top of your list of which a lumbar puncture is the method of choice for diagnosis.

MENINGITIS IN CHILDREN
Children with meningitis present with mostly nonspecific symptoms or signs.

Treatment for meningitis should be started before doing any investigations due to the seriousness of the disease.

The issue with the exam questions is it is often difficult to identify septicaemia and meningitis whereas in real life you could easily perform both blood cultures and a lumbar puncture which would point you towards a diagnosis. The following are some ways to help differentiate septicaemia and meningitis in children in the exam.

Clinical features	**Diagnosis**

Fever and vomiting	Septicaemia, Meningitis
Non-blanching rash	Septicaemia, Meningitis
Drowsy and confused	Septicaemia, Meningitis
Arthralgia and muscle aches	Septicaemia
Cold periphery	Septicaemia
Pale or mottled skin	Septicaemia
Shortness of breath	Septicaemia
Severe headache	Meningitis
Stiff neck	Meningitis
Photophobia	Meningitis

For exam purposes, a good trick which works most of the time is if the patient has got a rash, then perform blood culture as the diagnosis is most likely meningococcal septicaemia. The causative organism is Neisseria meningitides.

If there is no rash then a lumbar puncture (LP) would be the answer, but this can only be done if there are no signs of raised intracranial pressure (ICP).

Lumbar puncture contraindications to look out for during the exam:

- Glasgow Coma Scale less than 9 or a drop of 3 points or more
- Papilloedema
- Unequal, dilated or poorly responsive pupils
- Bulging tense fontanelle

Q-52

A 24 year old man develops itching worse at night and following a bath. Examination reveals a greyish white linear rash that can be seen on the flexor surface of the wrist and axillary folds. What is the SINGLE most likely diagnosis?

A. Scabies
B. Polycythaemia
C. Urticaria vasculitis
D. Atopic eczema
E. Lichen planus

ANSWER:
Scabies

EXPLANATION:
Do not get fooled by the itch that is worse at night following a bath. Although we see that commonly in polycythaemia, the greyish white lineaer rash on the wrist points towards scabies.

Q-53

A 17 year old man has acute pain and earache on the right side of his face. He has a temperature of 39.4 C and has extensive pre-auricular swelling that is

tender on palpation bilaterally. He also complains of headache, malaise, and dry mouth. What is the SINGLE most likely diagnosis?

A. **Acute mastoiditis**
B. **Acute otitis externa**
C. **Acute otitis media**
D. **Mumps**
E. **Otitis media with effusion**

ANSWER:
Mumps

EXPLANATION:
Please see Q-40

Q-54

A 33 year old African woman presents with episodes of fever with rigors and chills for the past year. Blood film shows ring form plasmodium with Schuffner's dots in red blood cells. What is the SINGLE most appropriate drug to eradicate this infection?

A. **Mefloquine**
B. **Doxycycline**
C. **Proguanil**
D. **Quinine**
E. **Primaquine**

ANSWER:
Primaquine

EXPLANATION:
Schuffner's dots are exclusively found in Plasmodium ovale and Plasmodium vivax. Thus primaquine should be used to eradicate them. The fact that they gave you the ethnicity, is another clue. Plasmodium ovale typically comes from Africa.

Plasmodium vivax → Fever spikes every 48 hours.
Plasmodium ovale → Similar to P. vivax, except untreated infection lasts less long.

Both may produce true relapses by new invasion of the blood from latent hypnozoites in the liver, up to a few years after complete clearance of parasites from the blood.

Ovale and vivax malaria have a hypnozoite stage and may therefore relapse following treatment.

Treatment of non-falciparum malaria
• Almost always chloroquine sensitive thus chloroquine is the drug of choice
• If chloroquine fails, resistant P. vivax can be treated with quinine

• Primaquine is used to destroy liver stage parasites and prevent relapse

Q-55

A drug addict has bitten a police officer. The police officer attends the Accident and Emergency alone. He had a tetanus booster injection 3 years ago after cutting his hand on glass while gardening. On examination, there is broken skin with blood. What would you advise the police officer?

A. HIV serology
B. Hepatitis & HIV serology
C. No test required at this stage
D. Tetanus toxoid
E. Post-exposure prophylaxis

ANSWER:
Post-exposure prophylaxis

EXPLANATION:
The patient is at risk of acquiring a blood-borne viral infection such as hepatitis B, hepatitis C and HIV. The biter is known to be a drug addict, and therefore is at a higher risk of being infected with a blood-borne virus. This wound is considered high risk, and post-exposure prophylaxis (PEP) should be started.

Testing for hepatitis B, hepatitis C, and HIV initially is recommended as a baseline test. This gives us clues to whether the police officer is already positive for HIV in which case the management differs. But the more important action is to start PEP as this can significantly change the outcome of the incident.

The police officer will also require follow up serology blood tests at 6 weeks, 3 months and 6 months.

All human bites should be treated with a 7 day course of oral co-amoxiclav. If the patient has a penicillin allergy, metronidazole plus doxycycline, erythromycin or clarithromycin.

He has had a tetanus booster within the last 5 years and therefore a further booster is not required.

EXAMPLE OF POST EXPOSURE PROPHYLAXIS (PEP) RISK ASSESSMENT
This is an example of how Emergency Departments would perform risk assessment for patients who may require PEP. This would differ slightly in every hospital and thus is unlikely to be asked in the exam due to the complexity of it.

PEP Risk Assessment

<u>Nature of incident must involve one of the following:</u>
- Sharp injury

- Blood splash to mucous membranes (e.g. eyes/mouth)
- Contamination of broken skin with blood
- Bite or Scratch (where skin is visibly broken)
- Any of the above involving urine or body fluid that is visibly blood stained.

Risk Assessment

			Score
Nature of exposure	Splash to broken skin	1	
	Splash to mucous membrane	1	
	Percutaneous penetration	2	
Type of body fluid	Non-bloody body fluid	0	
	Bloody body fluid	1	
Condition of sharp (if applicable)	Visibly clean	0	
	Visibly contaminated	1	
Type of sharp (if applicable)	Solid	0	
	Hollow	1	
Sharp Use (if applicable)	Suture/intramuscular/subcutaneous	0	
	Intravenous/arterial access	1	
Source patient	Unknown, or known but low risk	0	
	Known but unknown HIV status, but high risk	2	
	Known HIV positive	3	
		Total	

If total score is 3 or less – Prophylaxis not indicated
If total score is 4 to 7 – Consider prophylaxis
If total score is 8 to 10 – Offer prophylaxis

Q-56

A 28 year old man presents to Accident & Emergency with the complaint of coughing up blood. He coughed up about a teaspoon of fresh blood this morning and he coughed up a few drops on his way to the hospital. He has had no other episodes of haemoptysis in the past. Upon further questioning, it is revealed that he has had a chronic cough for the past two months. He has no history of recent travel outside of the United Kingdom. He drinks alcohol socially and smokes around four cigarettes a day. He admits to smoking marijuana occasionally with his friends. The patient works as a packer in a busy loading bay for a large manufacturing company. He is extremely nervous and thinks that he might have cancer as he read on the internet that one of the symptoms of cancer is the coughing up of blood. Upon physical examination, the patient looks unwell and cachectic. Dullness to percussion can be appreciated over the right upper zone of his chest. A chest X-ray reveals right upper lobe consolidation with a bilateral pleural effusion. What is the SINGLE most appropriate investigation for this patient?

A. Blood culture for cytomegalovirus (CMV)
B. Sputum for acid-fast bacilli (AFB)
C. Sputum for Pneumocystis jirovecii pneumonia (PIP)
D. Aerobic and anaerobic blood cultures

E. Pleural tap

ANSWER:
Sputum for acid-fast bacilli (AFB)

EXPLANATION:
Clues that point to tuberculosis in this stem are cachexic, chronic cough, haemoptysis. The chest X-ray findings are also consistent with tuberculosis. *In tuberculosis, the chest X-rays usually show upper lobe infiltrates with cavitation.*

Although marijuana is in the stem, smoking marijuana is not an independent risk factor for developing tuberculosis.

The patient would be asked to produce 3 samples of a deep cough sputum (with at least 1 early morning sample) and these are sent away for acid fast staining and culture.

Pleural aspiration as a diagnostic procedure is usually performed in unilateral pleural effusions where there is diagnostic uncertainty. Pleural aspiration is not routinely used as a diagnostic procedure for tuberculosis although it can detect TB.

Q-57

A 38 year old woman presents with dysphagia and a lump on her neck. On examination, there is a 5 cm by 4 cm erythematous neck swelling lateral to the thyroid cartilage. She has a temperature of 38.9 C, a respiratory rate of 28 breaths/minute and a heart rate of 110 beats/minute. What is the SINGLE most appropriate action?

ANSWER:
Intravenous antibiotics, incision and drainage

EXPLANATION:
Superficial neck abscesses are usually the result of an infection in a lymph node in the neck (lymphadenitis) turning into an abscess. Staphylococcus aureus is usually the culprit. Antibiotics can initially be given and if the abscess does not resolve then it may need to be drained. However, given this stem, it is clear that she is unwell and possibly septic and thus oral antibiotics would not be a good option here. Antibiotics need to be given intravenously, and the abscess needs to be drained.

Most cases of neck abscess require patients to be hospitalized and intravenous antibiotics to be given. Analgesia is also important to relieve pain from the abscess but the option to give oral antibiotics in combination with pain relief is an incorrect one in a scenario where the patient is potentially septic.

Draining of a superficial neck abscess is a simple procedure and is done under general anesthesia. Incision and drainage is important as the pus sample collected from the drainage is sent to the laboratory for culture and sensitivity. After the organism is identified, specific antibiotics can be used accordingly.

Q-58

A 38 year old female, 32 weeks pregnant presents with thick white marks on the inside of her mouth for 3 weeks. Her mouth including her tongue appears inflamed on examination. She smokes 20 cigarettes a day despite advice to quit. What is the SINGLE most likely diagnosis?

A. **Lichen planus**
B. **Aphthous ulcer**
C. **Molluscum contagiosum**
D. **Candidiasis**
E. **Leukoplakia**

ANSWER:
Candidiasis

EXPLANATION:
Smokers are more likely to develop oral thrush. The history of pregnancy is not too relevant. But the idea that the question writers want to portray is that in pregnancy, the immune system is weakened. Thus candidiasis is more likely.

Lichen planus may have lace like appearance and not thick white mark like in this case.

Aphthous ulcer is typically round or oval sores or ulcers inside the mouth.

Molluscum contagiosum present as firm, smooth, umbilicated papules on the trunk or extremities and not in the mouth like in the given stem.

Leukoplakia is an option but it is less likely that oral candidiasis. They may sometimes give a history of a white lesion in the mouth that cannot be rubbed off.

Q-59

A 22 year old lady comes to the hospital with complaints of fever, vertigo and pain in her right ear. On physical examination, there are vesicles at the right external auditory meatus. What is the SINGLE most likely diagnosis?

A. **Meniere's disease**
B. **Ramsay Hunt syndrome**
C. **Chicken pox**
D. **Acoustic neuroma**
E. **Cellulitis**

ANSWER:
Ramsay Hunt syndrome

EXPLANATION:
Please see Q-10

Q-60

A 32 year old breast feeding mother has a paniful, swollen, hard lump in her right breast which developed 2 weeks after having a normal vaginal delivery. She has a temperature of 38.1 C. A breast abscess is suspected. What is the SINGLE most likely organism?

A. **Staphylococcus aureus**
B. **Staphylococcus albus**
C. **Streptococcus agalactiae**
D. **Streptococcus pyogenes**
E. **Staphylococcus epidermidis**

ANSWER:
Staphylococcus aureus

EXPLANATION:
Infectious mastitis occurs when accumulated milk allows bacteria to grow. It typically develops within the first few weeks of breastfeeding. If treatment is delayed it may result in a breast abscess like in this case. The usual infecting organism is Staphylococcus aureus, although it may also be caused by Staphylococcus albus and streptococci.

If a breast abscess forms, advise the patient to discard the milk if it is pus-like. Flucloxacillin is usually the treatment of choice. It is safe for baby. Incision and drainage of abscess with cavity packed open with gauze is recommended if the underlying skin is thin or necrotic.

If the patient has mastitis, we would still encourage the patient to breastfeed as the blocked milk ducts may clear more quickly by breastfeeding as it keeps milk flowing. However, if the patient has an abscess, in some cases, breast-feeding may have to cease until the abscess is successfully treated.

Q-61

A 70 year old man presents to the Emergency Department with fatigue, fever and a productive cough. He is currently on his 4th course of chemotherapy for small cell carcinoma of his lungs of which finished 8 days ago. On auscultation, there are coarse crepitations on his right lung base. He has a temperature of 37.6 C, respiratory rate of 17 breaths/minute, pulse of 85 beats/minute and a blood pressure of 120/80 mmHg. His blood results come back showing the following:

Haemoglobin 122 g/L
White cell count 1.1 x 10^9/L
Platelets 90 x 10^9/L

What is the SINGLE most appropriate action?

A. **Start oral broad spectrum antibiotics**
B. **Start intravenous broad spectrum antibiotics**
C. **Request a granulocyte colony stimulating factor**
D. **Request a sputum culture**
E. **Reassure and send home**

ANSWER:
Start intravenous broad spectrum antibiotics

EXPLANATION:
This stem should ring bells of neutropenic sepsis. The question writers have deliberately left out the count for neutrophils. This is usually reported together with the white cell counts as it is part of the request for a full blood count. Nonetheless, the white cell count is shown to be low here which is consistent with neutropenic sepsis.

Neutropenic sepsis should not be taken lightly. It has a mortality between 2 to 21%. They can deteriorate rapidly and become hypotensive within hours. If the patient has received chemotherapy within the last 4 weeks and is now haivng a fever and feeling unwell, he should immediately be started on intravenous broad spectrum antibiotics. This should ideally be started even before the results of the full blood count come back.

Q-62

A 69 yeatr old woman lives in a nursing home following a stroke. She recently developed a reddish scaly rrash on her trunk. She has many scratch marks on her limbs and trunk with linear burrows seen on her hands and feet. What is the SINGLE most appropriate treatment?

A. **Aqueous cream**
B. **Chlorpheniramine**
C. **Coal tar**
D. **Hydrocortisone treatment**
E. **Permethrin**

ANSWER:
Permethrin

EXPLANATION:
Please see Q-12

Q-63

A 67 year old man who is currently on chemotherapy treatment for a malignancy suddenly develops febrile neutropenia. He has ben commenced on tazocin and gentamicin. He has recently commenced meropenem but his fever still remains at 39 C on the 4th day. Two blood tests and urine cultures have come back negative. Investigation done this morning show:

Haemoglobin 104 g/L
White cell count 0.5 x 10^9/L

Platelets 35 x 10^9/L

What is the SINGLE best management?

A. **Continue intravenous antibiotics and add oral antifungals**
B. **Continue intravenous antibiotics and intravenous antifungals**
C. **Stop antibiotics**
D. **Continue present antibiotics**
E. **Repeat blood culture**

ANSWER:
Continue intravenous antibiotics and add intravenous antifungals

EXPLANATION:
Continue inpatient empiric antibiotic therapy in all patients who have unresponsive fever unless an alternative cause of fever is likely. It is quite the norm to add on IV antifungals for neutropenic sepsis as well.

If there was an option to order investigations for fungal infections in this question, that would be correct as well.

General Management for Neutropenic Sepsis
- antibiotics must be started immediately (do not wait for the WBC)
- NICE recommend starting empirical antibiotic therapy with piperacillin with tazobactam (Tazocin) immediately
- if patient is still febrile and unwell after 48 hours → an alternative antibiotic such as meropenem is often prescribed +/- vancomycin
- if patient is not responding after 4-6 days → order investigations for fungal infections, rather than just starting antifungal therapy blindly

Q-64

A 30 year old man from Australia returned from a business trip to Indonesia 6 days ago presenting with complaints of fever, headache, vomiting, joint and muscle ache. His headache is felt behind the eyes and has been present for the past 2 days. What is the SINGLE most likely diagnosis?

A. **Malaria**
B. **Chicken pox**
C. **Diphtheria**
D. **Typhoid fever**
E. **Dengue**

ANSWER:
Dengue

EXPLANATION:

Dengue is characterised by an abrupt onset of fever often accompanied by severe headache and retro-orbital pain, myalgia, arthralgia, nausea, vomiting, and abdominal pain

Retro-orbital pain is a well recognized feature of dengue fever.

In PLAB 1, these are the most important epidemiology points that you need to know for infectious diseases

• Malaria: Africa
• Dengue fever: Far East Asia
• Typhoid: South America
• Diphtheria: India

Even if you did not know this, the signs and symptoms point toward dengue fever. Here is a summarised list of the presentation of these diseases. Remember to tie in the signs and symptoms with the travel history:

• Malaria: fever, chills, rigors
• Dengue Fever: generalised rash, biphasic fever, retro-orbital pain
• Typhoid: severe headache, patients adopt a crouching position
• Diphtheria: presents with flu-like symptoms initially, enlarged anterior cervical lymph nodes

Q-65

A 46 year old man is being investigated for indigestion. A jejunal biopsy shows deposition of macrophages in the lamina propria-containing granules which stain positive for Period Acid-Schiff (PAS). What is the SINGLE most likely diagnosis?

A. Bacterial overgrowth
B. Coeliac disease
C. Tropical sprue
D. Whipple's disease
E. Small bowel lymphoma

ANSWER:
Whipple's disease

EXPLANATION:
A jejunal biopsy shows deposition of macrophages in the lamina propria-containing granules which stain positive for Periodic Acid-Schiff (PAS) are diagnostic for Whipple's disease.

Whipple's disease
Whipple's disease is a rare disease featuring GI malabsorption which usually occurs in middle-aged white males, most commonly in Europe. It is fatal if untreated and is caused by Tropheryma whippelii, which, combined with defective cell-mediated immunity, produces a systemic disease.

Features:
- Often starts insidiously with arthralgia (mainly peripheral joints)
- GI symptoms commonly include colicky abdominal pain, weight loss, steatorrhea/diarrhoea, which leads to malabsorption.
- Systemic symptoms such as chronic cough, fever, sweats, lymphadenopathy and skin hyperpigmentation also occur
- Cardiac involvement may lead to endocarditis
- CNS features include a reversible dementia, ophthalmoplegia, and facial myoclonus

Tests:
- Diagnosis requires a high level of clinical suspicion
- Jejunal biopsy shows stunted villi. There is deposition of macrophages in the lamina propria-containing granules which stain positive for Periodic Acid-Schiff (PAS).

Q-66

A 40 year old man who recently traveled to Sudan 5 weeks ago presents with dark urine, rigors and a fever. On examination, a tender hepatomegaly was noted. What is the SINGLE most likely diagnosis?

A. Malaria
B. Brucellosis
C. Leptospirosis
D. Schistosomiasis
E. Ebola

ANSWER:
Malaria

EXPLANATION:
This is a very interesting question with a huge debate between Malaria and Schistosomiasis.

Initially, one may pick Schistosomiasis as Schistosomiasis is widely distributed in udan with more than 5 million people, mostly children, requiring treatment. 5 weeks here fits the timeline of schistosomiasis as symptoms usually takes from four to six weeks from the time of infection. They may feel generally unwell at this point however in majority of cases blood in the urine only occurs somewhere between 10 to 12 weeks after the infection. The blood in urine is due to the worms of Schistosoma haematobium migrating to the veins around the bladder and ureters.

Furthermore, one must remember that bladder involvement is caused by Schistosoma haematobium while Schistosoma mansoni is mainly responsible for intestinal forms of disease. Hepatomegaly is not a clinical feature of infection with Schistosoma haematobium (which causes the bloody urine). It can be seen in infections with Schistosoma mansoni but again these are two different infections. Infections with

Schistosoma mansoni does not cause bloody urine.

In short, a patient suffering from urinary schistosomiasis (caused by Schistosoma haematobium) will develop terminal haematuria, while another patient infected with Schistosoma mansoni may develop hepatomegaly but ultimately these symptoms are caused by different species.

Considering the clinical features, the best answer is Malaria. Blackwater fever is a complication of malaria infection in which red blood cells burst in the bloodstream (haemolysis), releasing hemoglobin directly into the blood vessels and into the urine. This accounts for the dark urine. Malaria is also known to cause hepatomegaly.

Q-67

A 16 year old girl has had an enlarging mass in the right side of her neck for the past 2 weeks with a sore throat. She feels tired and weak. She has several smaller associated lymph nodes that are palpable at her axilla. Oropharyngeal examination shows tonsillar enlargement which is exudative. What is the SINGLE most likely diagnosis?

- **A. Infectious mononucleosis**
- **B. Leukaemia**
- **C. Lymphoma**
- **D. Mumps**
- **E. Tuberculosis**

ANSWER:
Infectious mononucleosis

EXPLANATION:
Please see Q-18

Q-68

A 28 year old man presents with a deep penetrating wound on his foot after having stepped on a nail in a field. He said he had the full course of tetanus vaccine when he was in school and again at 18 years old. What is the SINGLE most appropriate management to be given?

- **A. Tetanus immunoglobulins only**
- **B. Tetanus immunoglobulins and tetanus vaccine**
- **C. Complete course of tetanus vaccine**
- **D. Tetanus booster vaccine only**
- **E. Antibiotic**

ANSWER:
Tetanus immunoglobulins only

EXPLANATION:

In the UK, if the patient has received a full five-dose course of tetanus vaccine at the recommended intervals, or is up-to-date with their tetanus immunisation schedule, no further doses of vaccine are recommended even with a tetanus-prone wound however, high-risk wounds still need intramuscular human tetanus immunoglobulins.

There are some exceptions for when tetanus boosters are indicated for patients who have completed their five-dose course of tetanus vaccines but are traveling to remote areas, but this is unlikely to be asked during the exam.

Q-69

A 33 year old woman has a 2 day history of numerous painful ulcers on her vulva. She is sexually active and has multiple partners in the past. What is the SINGLE most likely cause of her ulcers?

A. **Chlamydia**
B. **Trichomonas vaginalis**
C. **Varicella-zoster virus**
D. **Herpes simplex virus**
E. **Treponema pallidum**

ANSWER:
Herpes simplex virus

EXPLANATION:
The probable diagnosis here given the symptoms of numerous painful ulcers is genital herpes which is caused by HSV type 2.

The two distractors here are Treponema pallidum and Varicella-zoster virus.

Treponema pallidum which causes syphilis presents with PAINLESS papules that later forms PAINLESS ulcers.

Varicella-zoster causes shingles if reactivation occurs later in life which presents with vesiculation and ulceration in a dermatomal distribution.

Q-70

A 30 year old woman had unprotected sexual intercourse 48 hours ago with a man who is HIV positive and takes antiretroviral therapy. His last viral load a week ago was 1000 copies/mL. What is the SINGLE most appropriate action?

A. **Reassure patient, no action required as sexual partner's viral load is too low.**
B. **No immediate action required as missed time period for post exposure prophylaxis**
C. **Advise post exposure prophylaxis for 5 days**
D. **Advise post exposure prophylaxis for 28 days**
E. **Serological testing immediately and wait for results prior to treatment**

ANSWER:
Advise post exposure prophylaxis for 28 days

EXPLANATION:
Post exposure prophylaxis (PEP) should always be given for 28 days. Some doctors in A&E might give 5 days of PEP and ask the patient to go to sexual clinic to get assessed and to be given the remaining 23 days of PEP if required. This is because A&E can be busy at times , and to do a full risk assessment of HIV exposure and council the patient might be difficult hence they throw the decision to someone with more expertise on the topic. However, for the purpose of the exam, always recommend that the duration of PEP be 28 days.

Serological testing immediately is appropriate as a baseline test. This would be the 4th generation laboratory venous blood HIV test. This can give us clues to whether the woman is already positive for HIV in which case management may be different. However, we should also start PEP immediately and not wait for results of serology.

The viral load in this stem is NOT low. IF the source is on antiretroviral therapy (ART) with a confirmed and sustained (> 6 months) undetectable

HIV Post-exposure prophylaxis

- Drugs used in PEP are a combination of oral antiretrovirals to be given as soon as possible (i.e. within 1-2 hours, but may be started up to 72 hours following exposure) for 28 days. This reduces the risk of contracting HIV. *A few guidelines recommend PEP within 48 hours after exposure, but in the UK you can get PEP for up to 72 hours after exposure, it is just less effective if given late.*
- The first-line regimen is Truvada and Raltegravir for 28 days
- Follow-up HIV testing is recommended at 8-12 weeks after exposure

TYPES OF HIV TESTS
Always consider the window period!
4th generation serological testing

- Detects anti-HIV antibodies and the p24 antigen (a virally-derived protein that is present in the early stages of HIV infection before antibodies do)
- Window period for this test is 4 weeks
- Detects majority of individuals who have been infected with HIV at one month (4 weeks) after specific exposure.
- Recommended in the BHIVA/BASHH/BIS UK guidelines for HIV testing
- If negative, still need to offer HIV serology test at 12 weeks to confirm negative results.

Point of care testing

- Uses capillary blood (finger prick) or saliva (mouth swab) – Sample do not need to be sent to a laboratory and results will be available within a few minutes
- Measures anti-HIV antibodies

- Has a lower specificity and sensitivity compared with 4th generation serological testing
- The window period is up to 12 weeks but the result is available within minutes
- Offer in situations where venepuncture is declined or difficult to give people results of test (e.g. unwilling to leave contact details)
- If positive or 'reactive' (non-negative), will need to be confirmed by serological testing.

Home self-sampling kit

- Kits ordered online
- Saliva sample or capillary blood (finger prick) is taken at home by patient and sent off in the post for testing

Home self-teting kit

- Kits ordered online
- Saliva sample or capillary blood (finger prick) is taken at home by patient and tested at home
- Results will be available within minutes

Q-71

A 3 year old boy presents with a two day history of being unwell. He has a two hour old rash made up of urticarial and purpuric spots. His level of consciousness is decreased. He has a blood presssure of 80/50 mmHg, a respiratory rate of 30 breaths/minute, oxygen saturation of 94% on room air, a temperature of 39 C and a capillary refill time of 3 seconds. A urine dipstick was found to be unremarkable. What is the SINGLE investigation most likely to lead to a diagnosis?

A. Blood culture and sensitvity
B. Erythrocyte sedimentation rate (ESR)
C. Chest X-ray
D. Urine for culture and sensitivity
E. Cerebrospinal fluid analysis

ANSWER:
Blood culture and sensitivity

EXPLANATION:
A very straight forward question. The child is clearly septic with the likely diagnosis of meningococcal septicaemia. Blood culture is the investigation of choice.

Q-72

A 35 year old woman has numerous painful blisters and sores on her vulva. She also complains of a flu-like illness with mild fever starting a few days ago. The pain in the vulva is so severe that she refuses to go to the toilet to urinate. She is prescribed pain relief. What other treatment should be offered.

A. Doxycycline

B. **Gentamicin**
C. **Penicillin**
D. **Aciclovir**
E. **Interferon**

ANSWER:
Aciclovir

EXPLANATION:
The diagnosis here is genital herpes. The pain caused by genital herpes is so severe that it can cause urinary retention. Genital herpes is treated with aciclovir.

Q-73

A 68 year old woman has a sudden onset of pain and loss of hearing in her left ear and unsteadiness when walking. There are small lesions visible on her palate and left external auditory meatus. What is the SINGLE most likely diagnosis?

A. **Acute mastoiditis**
B. **Cholesteatoma**
C. **Herpes zoster infection**
D. **Oropharyngeal malignancy**
E. **Otitis media with effusion**

ANSWER:
Herpes zoster infection

EXPLANATION:
Please see Q-10

Q-74

A 3 year old boy going to nursery has developed chicken pox. What advice will you give the parents?

A. **Stop sending to nursery until rash disappears completely**
B. **Continue sending to nursery without a break**
C. **Resume nursery once rash starts crusting over**
D. **Resume nursry once fever resolves**
E. **Start oral aciclovir and resume nursery**

ANSWER:
Resume nursey once rash starts crusting over

EXPLANATION:
The most infectious period is 1-2 days before the rash appears, but infectivity continues until all the lesions are dry and have crusted over (usually about 5 days after the onset of the rash). Therefore, children with chickepox should be kept away from school or

nursery until all the vesicles have crusted over.

Q-75

A 14 year old boy has pain and swelling at the angles of the jaw bilaterally. He has a temperature of 38.4 C. He has been complaining of dry mouth and sore ears and he finds it difficult to talk. On examination, his scrotum is also swollen and oedematous and the testes are impalpable. What is the SINGLE most likely diagnosis?

A. **Acute mastoiditis**
B. **Epididymo-orchitis**
C. **Acute otitis media**
D. **Mumps**
E. **Measles**

ANSWER:
Mumps

EXPLANATION:
Please see Q-40

Q-76

A 7 year old boy presented 10 hours after having a foot injury while playing football in the garden. A metal spike had gone through his shoes and pierced the bottom of his foot. His immunisations are up to date. What is the SINGLE most appropriate management?

A. **Administer antibiotics and immunoglobulins**
B. **Administer antibiotics, immunoglobulins and vaccine**
C. **Administer antibiotics and vaccine**
D. **Administer immunoglobulins and vaccine**
E. **Administer antibiotics only**

ANSWER:
Administer antibiotics and immunoglobulins

EXPLANATION:
It is clear that this injury is to be considered a high risk wound. Intramuscular human tetanus immunoglobulin need to be administered. Antibiotics would also be useful to add on here to prevent wound infection.

Q-77

A 29 year old lady with a history of intravenous drug use was investigated for symptoms of malaise and loss of appetite. Blood tests showed:

HBsAg negative

Anti-HBC positive
Anti-HBs negative
HCV antibody reactive
HCV RNA detected

In additionto this, liver biopsy produced a histopathological sample that demonstrated moderate necrosis and inflammation with definite steatosis. What is the SINGLE most likely cause for these findings?

A. **Past Cytomegalovirus infection**
B. **Current Human Immunodeficiency Virus infection**
C. **Previous Hepatitis E virus infection**
D. **Current Hepatitis B virus infection**
E. **Current Hepatitis C virus infection**

ANSWER:
Current Hepatitis C virus infection

EXPLANATION:
Option E. Current Hepatitis C virus infection is the correct answer given that the serology is indicative of likely resolved hepatitis B infection as well as presence of HCV RNA. The histopathological findings in this case are helpful to you if you can remember this from your early days in medical school, however the serology is enough to get the answer. So don't be thrown by details like this. Given that the patient is an intravenous drug user, you should consider blood borne viruses. Remember hepatitis C is associated with cirrhosis and eventual hepatocellular carcinoma.

Option A. Past Cytomegalovirus infection is not correct as there is no indication in the stem or the results that this infection is present.

Option B. Current Human Immunodeficiency Virus infection is not correct as there is no indication in the stem regarding HIV infection although it is a blood borne virus. Therefore it is tehre to try to confuse you.

Option C. Previous Hepatitis E virus infection is not the correct answer as there is no mention of hepatitis E virus in the results and this is usually transmitted via faecal-oral route in less developed countries. There is no indication of this in the question.

Option D. Current Hepatitis B virus infection is not the correct answer as the blood test results show an equivocal test result which is commonly due to resolved infection. This is very probable in this case as this is a blood borne infection and this patient has a major risk factor for contracting this in her lfe. A relatively low proportion (around 5%) of people with hepatitis B progress to chronic infection.

Q-78

A 58 year old woman attends clinic for advice as her grandson who lives with her has developed chicken pox with the rash appearing 2 days ago. She is currently undergoing chemotherapy for breast cancer and has been using long term

corticosteroids to manage her inflammatory bowel disease. She has never had chicken pox before. On examination, there is no evidence of any rash. What is the SINGLE most appropriate management?

- **A. Intravenous aciclovir**
- **B. Oral aciclovir**
- **C. Immunisation against varicella zoster**
- **D. Varicella zoster immunoglobulin**
- **E. Reassurance**

ANSWER:
Varicella zoster immunoglobulin

EXPLANATION:
The patient is clearly immunocompromised. She is on chemotherapy AND she is taking long term steroids. She is at a high risk of developing severe complictions from varicella infection. As she is currently asymptomatic, the best management would be immunoglobulins. If she had developed the infection, then we would administer aciclovir.

Q-79

A 65 year old man visited his local GP with complaints of difficulty and pain in swallowing. These symptoms have been occurring for approximately two weeks now. His appetite has also decreased and he has noticed some white patches on his tongue. His medical history is significant for non-insulin dependent diabetes mellitus, diagnosed two years ago. He claims that his condition is well controlled and that he is compliant with his medication. He also casually mentions that he quit smoking six years ago. During the consult, the patient appears to be in a generally good state of health. He reported a recent use of antibiotics for an upper respiratory tract infection that he recovered from a week ago. On examination, the patient's vital signs, including his blood glucose level, were all found to be within normal limits. Examination of the head and neck region revealed no palpable lymph nodes. An extra-oral examination performed proved to be insignificant. An intra-oral examination of the patient revealed an extensive white plaque on the midline of the posterior dorsal portion of the tongue measuring approximately 1.5 centimetres in diameter. What is the SINGLE most likely treatment option for this patient?

- **A. Fluconazole oral suspensionj**
- **B. Chlorhexidine mouthwash**
- **C. Intravenous amphotericin B**
- **D. Oral itraconazole**
- **E. Oral ketoconazole**

ANSWER:
Fluconazole oral suspension

EXPLANATION:

This patient is suffering from oral thrush which is also known as oral candidiasis. It is an infection caused by a yeast germ called Candida albicans. This patient has quite a few risk factors for oral thrush. Firstly, he is an elderly man who is diabetic and thus, immunocompromised. He also had a recent course of antibiotics which also contributes to the susceptibility of getting oral thrush.

The clincher to diagnose oral candidiasis in this patient is his positive examination findings. The patches generally progress to form larger plaques and the presence of candida may become painful and cause discomfort in eating food.

The most appropriate treatment option in this patient is an oral fluconazole suspension. Note that fluconazole also comes in capsules which is also suitable. It helps to clear fungal infections in people with a poor immune respone who develop extensive oral thrush.

Chlorhexidine mouthwash is an antibacterial mouthwash. It is mainly used to treat gingivitis and is used for the maintenance of oral hygiene. So, that is not the correct option.

Q-80

A 30 year old homeless lady has cough, sputum and a fever for the past few months. She complains of night sweats and has lost 13 kg in the past 6 months. A chest X-ray was performed which showed apical involvement with infiltrates and cavitation in the upper lobe of the right lung. What is the next SINGLE most appropriate test to perform?

A. **Acid-Fast Bacilli smear**
B. **Mantoux test**
C. **Interferon Gamma test**
D. **Bronchoscopy**
E. **Computed tomography**

ANSWER:
Acid-Fast Bacilli smear

EXPLANATION:
It is important to remember the risk factors of tuberculosis as well as how it presents.

Weight loss is common because of the chronicity of the infection. Night sweats also occurs with TB.

Homeless people are at higher risk of TB as they often live in overcrowded areas and have poor housing which encourage the spread of TB. It is estimated that homeless are at 150 times at risk of TB than the UK average.

Stain for Acid-Fast Bacilli (AFB) is the most appropriate next test.

Mantoux test and interferon gamma test are used to diagnose latent tuberculosis infection and not acute cases of tuberculosis.

Bronchoscopy is sometimes used when there is a need to obtain bronchoalveolar lavage or lymph node samples. It is used if a patient has non-productive cough or an unhelpful sputum culture but the physicians still have a high index of clinical suspicion for tuberculosis.

Q-81

A 36 year old homosexual man has multiple purple nodular lesions on his face and upper trunk measuring 1-2 cm across. It is not painful or itchy. What is the SINGLE most likely diagnosis?

A. **Kaposi's sarcoma**
B. **Squamous cell carcinoma**
C. **Basal cell carcinoma**
D. **Melanoma**
E. **Cryptococcal infection**

ANSWER:
Kaposi's sarcoma

EXPLANATION:
Please see Q-30

Q-82

A 30 year old man is seen in the emergency department with vomiting, muscle pain, rash at his axilla and sensitivity to light. He has a temperature of 38.9 C. The medical staff are suspecting he is suffering from meningitis. Which is the SINGLE most appropriate empirical antibiotic to be started immediately?

A. **Intramusculaer benzylpenicillin**
B. **Intravenous cefotaxime**
C. **Intravenous gentamicin**
D. **Intravenous aciclovir**
E. **Intravenous amoxicillin**

ANSWER:
Intravenous cefotaxime

EXPLANATION:
In a hospital setting, give intravenous third generation cephalosporin antibiotics (ceftriaxone or cefotaxime)

If this exact same questions was given but she presented to her GP (or was found outside the hospital), then benzylpenicillin IM or IV would be the correct answer. If you

suspect meningitis and patient is not yet in the hospital give IM/IV benzylpenicillin and send patient to the hospital.

If this exact same question was given, but there was a diagnosis of Listeria, then IV amoxicillin and gentamicin would be the correct answer

If this exact same question was given, but she is penicillin or cephalosporin allergic, then chloramphenicol would be the answer. If the patient has a history of immediate hypersensitivity reaction to penicillin or to cephalosporins the BNF recommends using chloramphenicol.

Investigations
Generally, treatment for meningitis should be started before doing any investigations due to the seriousness of the disease.

Rash
If patient has got a rash, then perform blood culture as the diagnosis is most likely meningococcal septicaemia. The causative organism is Neisseria meningitides.

If there is no rash then a lumbar puncture would be a better answer, but this can only be done if there are no signs of raised intracranial pressure. Patients with increased ICP from mass lesions often display decreased levels of consciousness, focal neurological signs or papilloedema on physical exam.

Management of contacts
Prophylaxis (oral ciprofloxacin or rifampicin) needs to be offered to household and close contacts of patients affected with meningococcal meningitis

Summary
Pre-hospital setting + Suspect meningococcal disease → IM benzylpenicillin
Hospital setting + Suspect meningococcal disease →IV cefotaxime
Meningitis caused by listeria → IV amoxicillin and gentamicin
Hypersensitivity reaction to penicillin or cephalosporins → chloramphenicol
Prophylaxis to close contact (meningococcal meningitis) → oral ciprofloxacin or rifampicin

Q-83

A 30 year old man presents to the emergency department with difficulty breathing. He has returned from India 5 days ago. On examination, his throat reveals grey membranes on the tonsils and uvula. He has fever and enlarged anterior cervical lymph nodes. What is the SINGLE most likely diagnosis?

A. Diphtheria
B. Infectious mononucleosis
C. Acute follicular tonsillitis
D. Scarlet fever

E. Agranulocytosis

ANSWER:
Diphtheria

EXPLANATION:
History of travel to India with grey membrane in tonsil and uvula, and a low grade fever, supports the diagnosis of diphtheria. Note that the pseudomembrane may cause respiratory obstruction as seen in this question.

Diphtheria
Risk factors
- In countries where hygiene is poor, cutaneous diphtheria is the predominant clinical manifestation and source of infection.
- Poor living conditions and lack of immunisation, especially where there is not an immunisation programme, increase risk

Presentation
- Very early symptoms may be similar to the common cold.
- Often diphtheria presents with a nasal discharge that is initially watery and becomes purulent and blood-stained. The nostril can be sore or crusted with the pseudomembrane sometimes visible within the nostril.
- Incubation period is usually 2-5 days, but may be up to 10 days.
- In diphtheria of the upper respiratory tract, there is a membranous pharyngitis (often referred to as a pseudomembrane) with fever, enlarged anterior cervical lymph nodes and oedema of soft tissues giving a 'bull neck' appearance.
- The pseudomembrane may cause respiratory obstruction.
- Swallowing may be made difficult by unilateral or bilateral paralysis of the muscles of the palate.
- The exotoxin also affects other parts of the body, including the heart and nervous systems. It may cause paralysis and cardiac failure.

Q-84

A 21 year old man has generalized skin lesions. The skin lesions consist of macular, papular and vesicles and concentrated more on his back and chest. Pinkish fluid is seen secreted from a few of the lesions. He has a temperatutre of 39.1 C. What is the SINGLE most appropriate medication to prescribe?

A. Topical antibiotics
B. Topical steroids
C. Oral antibiotics
D. Oral steroids
E. Topical steroid and antibiotic gel

ANSWER:
Oral antibiotics

EXPLANATION:
The skin lesions seen in different stages are quite classical for chicken pox. As this man has a temperature of 39.1°C, it is likely that there is a secondary infection that requires oral antibiotics. Usually cases of chicken pox only require symptomatic treatment but if chicken pox blisters become infected with bacteria, they would require antibiotic treatment. With a temperature of 39.1°C, oral antibiotics is more suitable than topical.

Q-85

A 24 year old college student presents to A&E with nausea, vomiting, headache, neck stiffness and a fever of 38.4 C. What is the SINGLE most appropriate empirical antibiotic to be started immediately?

A. **Intravenous Ceftriaxone**
B. **Intramuscular Benzylpenicillin**
C. **Intravenous Gentamicin**
D. **Intravenous Tazobactam**
E. **Intravenous Amoxicillin**

ANSWER:
Intravenous Ceftriaxone

EXPLANATION:
She has signs of meningitis. Intravenous Ceftriaxone needs to be administered immediately. In a hospital setting, give intravenous third generation cephalosporin antibiotics (Ceftriaxone or Cefotaxime)

If this exact same questions was given but she presented to her GP (or was found outside the hospital), then Benzylpenicillin IM or IV would be the correct answer. If you suspect meningitis and patient is not yet in the hospital give IM/IV benzylpenicillin and send patient to the hospital.

If this exact same question was given, but there was a diagnosis of Listeria, then IV amoxicillin and gentamicin would be the correct answer

If this exact same question was given, but she is penicillin or cephalosporin allergic, then chloramphenicol would be the answer. If the patient has a history of immediate hypersensitivity reaction to penicillin or to cephalosporins the BNF recommends using chloramphenicol.

Q-86

A 3 year old child was treated for bacterial meningitis and has recovered from it. She is now afebrile. What is the SINGLE most appropriate investigation to perform?

A. **CT scan**

B. EEG
C. Blood culture
D. Repeat lumbar puncture
E. Hearing test

ANSWER:
Hearing test

EXPLANATION:
One of the delayed complications of meningitis is decreased hearing, or deafness. Hearing loss may be partial or total. People who have had meningitis will usually have a hearing test after a few weeks to check for any problems

Q-87

A 23 year old homosexual man presents to the genitourinary medicine clinic with urethral discharge. A few weeks ago, he had a painless ulcer on his penis which healed. He is sexually active. What is the SINGLE most appropriate investigation to confirm the diagnosis?

A. Midstream urine sample for culture
B. Blood culture
C. Serology for syphilis
D. Polymerase chain reaction (PCR)
E. Dark ground microscopy

ANSWER:
Serology for syphilis

EXPLANATION:
This man has had a painless ulcer (chancre) which healed. This is the primary stage of syphilis. The reason the stem included that he is homosexual is that syphilis is more common in MSM (men who have sex with men).

If syphilis is suspected, bloods for VDRL, TPHA or treponemal antibody absorption should be sent off depending on local policy. These are serology tests. Some GUM clinics perform microscope or laboratory test on a skin ulcer sample if the ulcer is present however the most important test for syphilis is carried out on a blood sample.

Polymerase chain reaction (PCR) or dark field microscopy can only be carried out from a sample of the lesion or an infected lymph node. Since the ulcer is healed, a sample cannot be obtained.

If there was an ulcer visible, a dark field microscopy would allow a point of care syphilis diagnosis. The GUM physician would visualize the live treponemes, obtained from a variety of cutaneous or mucous membrane lesions while in the clinic and could treat the patient right there and then. This obviously has a huge advantage. However if the

patient presents to a GP surgery, a PCR would be performed as GPs do not have facilities or capabilites to perform a dark field microscopy. So the answer for most appropriate investigations of syphilis if a patient presents with an ulcer would depend on which type of clinic he visits – a GP surgery or a GUM clinic.

A midstream urine sample would detect a urinary tract infection, not a sexual transmitted disease.

Q-88

A 20 year old man with a known diagnosis of otitis media presents with a severe headache, and sensitivity to light. He is shivering, sweating and has a temperature of 38.9 C. What is the SINGLE most likely complication?

- **A. Giant cell arteritis**
- **B. Meningitis**
- **C. Myringitis**
- **D. Trigeminal neuralgia**
- **E. Labyrinthitis**

ANSWER:
Meningitis

EXPLANATION:
One of the very serious but rare complications of otiis media is meningitis. This patient has clear signs that resemble meningitis.

Q-89

A 44 yearold man with rheumatoid arthritis has come to clinic with concerns as his partner who he has lived with has developed shingles 2 days ago. He has been taking long term prednisolone and methotrexate to manage his rheumatoid arthritis. He gives a history that he has had chicken pox when he was 5 years old. On examination, there are no lesions noted on his skin. What is the SINGLE most appropriate action?

- **A. Intravenous acyclovir**
- **B. Prescribe oral acyclovir**
- **C. Temporary cease prednisolone and methotrexate**
- **D. Obtain serology for varicella immunity**
- **E. No further action needed**

ANSWER:
Obtain serology for varicella immunity

EXPLANATION:
This patient is clearly immunocompromised. The management for

immunocompromised patients exposed to chicken pox differs greatly. Some physicians may consider offering oral aciclovir to the immunocompromised when exposure is significant. However, NICE CKS clearly states that “People who have had a significant exposure to chickenpox and who re immunocompromised should be tested for varicella zoster antibody, regardless of their history of chickenpox”

In an immunocompromised healthy person, specialist advice should be obtained regarding confirmation of the diagnosis and the need to start urgent aciclovir.

Q-90

A 7 year old child is being investigated for active respiratory tuberculosis. He has dry cough and is unable to produce sputum. His parents have been informed about the possibility of a bronchoalveolar lavage which can be useful in diagnosing tuberculosis however the parents decine this invasive test. What is the SINGLE next method to acquire a sample to diagnose tuberculosis?

A. **Venipuncture**
B. **Throat swab**
C. **Gastric lavage**
D. **Liver biopsy**
E. **Lumbar puncture**

ANSWER:
Gastric lavage

EXPLANATION:
The diagnosis of tuberculosis is usually made in one of three ways:
1. Smear of sputum → Staining with Ziehl-Neelsen (ZN) stain and microscopy for acid-fast bacilli
2. Culture of sputum → Takes 4-8 weeks due to slow bacterial growth
3. Histology with caseating granulomas on biopsy

This young child is unable to cough up sputum and thus there is no sample to perform a stain for Acid-Fast Bacilli (AFB). Bronchoalveolar lavage would be the next step to attempt to acquire a sample given the high index of suspicion for tuberculosis. As the parents of the child have declined this procedure, gastric lavage would be able to acquire a sample. Some patients with tuberculosis do not raise any sputum but instead swallow small amounts of sputum. Gastric washings reflect TB swallowed overnight. It is rarely performed if bronchoscopy is readily available but it is commonly used in children.

Q-91

A surgeon was pricked by a needle used during an appendectomy. Basic first aid for the surgeon has been performed. After the operation, the patient was

informed of the incident and gave her consent to be tested for blood-borne infections for the benefit of the surgeon. The patient states that she is a dental nurse, practices safe sexual intercourse and denies use of any intravenous drugs. She has never been tested for blood-borne infections. The surgeon remembers being immunised for hepatitis B but cannot remember the last time he received a booster for hepatitis B. What is the SINGLE most appropriate action for the patient and the surgeon on the day of the incident?

A. **Test patient for HIV antibodies, hepatitis C virus antibodies, hepatitis B surface antigen. Test surgeon for hepatitis B surface antigen.**
B. **Test patient for HIV antibodies, hepatitis C virus antibodies, hepatitis B surface antigen. Test surgeon for hepatitis B surface antigen and offer hepatitis B booster.**
C. **Test patient for hepatitis C virus antibodies, hepatitis B surface antigen. Test surgeon for HIV antibodies**
D. **Test patient for HIV antibodies, hepatitis C virus antibodies. No further action required for the surgeon.**
E. **Test patient for HIV antibodies, hepatitis C virus antibodies, hepatitis B surface antigen. Advise surgeon to start post-exposure prophylaxis.**

ANSWER:
Test patient for HIV antibodies, hepatitis C virus antibodies, hepatitis B surface antigen. Test surgeon for hepatitis B surface antigen and offer hepatitis B booster.

EXPLANATION:
Basic first aid for needle stick injuries includes washing with soap under running water and encouraging bleeding in that area. When there is a needle stick injury to health care professionals, occupational health must be contacted.

The patient should be informed that there has been a needle stick injury and permission should be asked prior to taking bloods for HIV antibodies, hepatitis B surface antigen and hepatitis C virus antibodies. The reason for consent is to ensure that the patient is given appropriate information about the implications of the test if they come back positive.

The patient is considered low risk, therefore post-exposure prophylaxis is not necessary for the surgeon.

In this case, hepatitis B surface antigen blood test for the surgeon would suffice. Hepatitis C virus and HIV antibodies are usually not indicated at time of injury as it takes time for the antibodies to develop if the surgeon gets infected. The serum is stored for future use if required.

Additional information: The surgeon should return in 6 weeks for a full set of seroloogy which now incudes hepatitis C virus and HIV antibodies. If this comes back negative, and the patient's initial blood test was also negative, the surgeon can be discharged

with no further follow up. If for any reason, the patient did not provide consent for bloods to be taken, then the surgeon would need to have his bloods tested immediately after the injury, at 6 weeks, at 12 weeks and at 24 weeks.

Another take-home point is that the surgeon should be offered a hepatitis B booster as he has been previously immunised but unable to remember when was the last booster he received.

*Additional information: A useful mnemonic to remember is the rule of **"3"** when it comes to needle stick injuries. The rates of transmission to the recipient following innoculation of blood through a hollow bore needle are as follows:*

- *0.**3**% if the donor is HIV-positive*
- ***3**% if the donor is hepatitis C antibody-positive*
- ***30**% if the donor is hepatitis B surface antigen positive*

Q-92

A 19 year old woman attends the genitourinary medicine clinic with a few cauliflower-like growths of varying size at the vulva after returning from Spain several weeks ago. She is concerned and would like treatment. She has no previous medical conditions. What is the SINGLE most appropriate treatment?

A. Gardasil
B. Cryotherpay
C. Podophylin
D. 5-fluorouracil
E. Interferon

ANSWER:
Cryotherapy

EXPLANATION:
Genital warts are benign epithelial skin tumours commonly seen as cauliflower-like growths. They are most commonly caused by HPV types 6 and 11. Transmission is through sexual intercourse. The incubation period is between 3 weeks to several months.

Gardasil is a quadrivalent vaccine that protects against 4 types of HPV: 6, 11, 16 and 18. HPV 6 and 11 are responsible for benign genital warts, and HPV 16 and 18 are responsible for most cervical cancers in the UK. Gardasil does not treat established genital warts.

Patients can decide not to be treted as in around 30% of patients, warts can resolve spontaneously within 6 months. Treatment options include podophyllotoxin, imiquimod and ablative methods such as cryotherapy and excision under local anaesthetic.

NICE has stated that the following treatments are not recommended:

- Podophyllin

- 5-fluorouracil
- Interferon

Podophyllin and 5-fluorouracil are no longer recommended because they have high rates of adverse effects.

Q-93

A 44 year old woman with HIV attends the HIV clinic. Her last blood test shows her CD4 count to be at 160 cells/mm^3. Her CD4 count has been persistently below 200 cells/mm^3. The clinician suggests starting prophylactic antibiotics to prevent pneumocystis carinii pneumonia. What is the SINGLE most appropriate antibiotic?

A. Amoxicillin
B. Co-amoxiclav
C. Azithromycin
D. Co-trimoxazole
E. Erythromycin

ANSWER:
Co-trimoxazole

EXPLANATION:
The British HIV Association (BHIVA) recommends using co-trimoxazole as pneumocystic carinii pneumonia prophylactic treatment of choice for HIV-seropositive patients with persistent CD4 count less than 200 cells/mm^3.

Azithromycin has a role in prophylaxis against Mycobacterium avium complex in patients with HIV. It is used when CD4 counts fall below 50 cells/mm^3.