Two strains of *Escherichia coli* are isolated and both are resistant to ampicillin.

Strain A retains its resistance to ampicillin when grown from multiple generations in the absence of ampicillin. However, strain B loses its resistance when grown in the absence of ampicillin.

Which of the following best explains the loss of antibiotic resistance in strain B?

(Please select 1 option)

- Changes in the bacterial DNA gyrase
- Downregulation of the resistance gene
- Loss of a plasmid containing the resistance gene  □ This is the correct answer
- Mutations in the resistance gene  □ Incorrect answer selected
- Transposition of another sequence into the resistance gene

Bacteria develop resistance to antibiotics by gaining genes that encode for particular proteins that offer protection to the organism.

Sometimes this is by mutation and at other times the gene may be acquired from another bacterial species.

The genes are usually found in plasmids: circular segments of DNA separate from the bacterial chromosome.

Plasmids can easily spread from one bacteria to another; a sort of resistance package that bacteria can share.
Question 2 of 164

Which of the following is true of *Giardia lamblia* infection?

(Please select 1 option)

- [ ] Causes steatorrhoea  ☑️ Correct
- [ ] Diagnosed by stool culture
- [ ] Is eradicated by mebendazole
- [ ] Is often symptomatic
- [ ] Is usually spread by contaminated meats

*G. lamblia* is usually acquired by the faeco-oral route.

Many individuals excreting cysts are asymptomatic and are thus carriers. Others have diarrhoea, steatorrhoea, abdominal pain, and nausea.

It is diagnosed by stool microscopy; if negative, the parasite is found in duodenal aspirates or biopsy. Testing of serum antibodies against *G. lamblia* trophozoites is not useful in diagnosing current infection.

It is eradicated with metronidazole (or quinacrine, tinidazole, ornidazole, furazolidone, paromomycin). Mebendazole is used in treating hookworm infections (for example, *Ascaris*, whipworm, and threadworm).
Varicella zoster infection causes herpes zoster and chickenpox.

Herpes zoster is due to reactivation of the virus lying dormant in the cells of dorsal root ganglion.

Autonomic involvement can cause urinary retention.

Pregnancy increases risk of pneumonitis.

Chicken pox in the first and second trimester can produce a syndrome of skin scarring, hypoplastic limbs, eye and central nervous system impairments.

Pneumonitis is uncommon in children with an incidence of 0.3% in immunocompetent adults. The risk is higher in smokers.

Antiviral treatment includes aciclovir and vidarabine.
Question 1 of 63

A 23-year-old obese female with known tuberculosis presents with ulcerating nodules on the back of her legs.

Which of the following is the most likely diagnosis?

(Please select 1 option)

<table>
<thead>
<tr>
<th></th>
<th>Erythema induratum (EI)</th>
<th>Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Erythema marginatum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Erythema nodosum</td>
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<tr>
<td></td>
<td>Lupus pernio</td>
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<tr>
<td></td>
<td>Lupus vulgaris</td>
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</tr>
</tbody>
</table>

EI is a form of panniculitis characterised by chronic, recurrent, tender, subcutaneous, and sometimes ulcerated nodules on the lower legs that may also appear elsewhere.

Females are more frequently affected, with a female:male ratio of 7:1 and it is more frequent in younger females.

It is found in association with tuberculosis.

Erythema nodosum also a panniculitis is also commonly associated with tuberculosis and presents with painful erythematous nodules in recurrent crops over the legs and arms. The lesions however do not ulcerate.

Another possibility, although not provided in the stems, is pyoderma gangrenosum.
On the other hand, lupus vulgaris is a chronic, progressive, and destructive form of cutaneous tuberculosis in patients with a moderate or high degree of immunity. It occurs more commonly in females than in males.

The classical lesions consist of reddish-brown plaques not nodules. The lesions progress by peripheral extension and central healing, atrophy, and scarring. The areas of predilection are head and neck (80%), followed by arms, legs, then trunk.

This rash is not the typical description of erythema marginatum (finer rash) or multiforme (blisters, targets).

Lupus pernio occurs in association with sarcoid.
Work Smart

Question 4 of 164

Which of the following is true of anthrax?

(Please select 1 option)

- Eschars are usually painless  □ Correct
- Gastrointestinal anthrax is the most usual form of disease in humans
- It causes trivial disease in the host herbivore population
- It is caused by an aerobic, Gram negative rod
- Sputum culture has a high yield in inhalational anthrax

Anthrax is caused by the Gram positive, aerobic, non-motile *Bacillus anthracis*.

It produces serious disease in the herbivore host and carnivores acquire the disease from either consuming the spores from the dead animal or by contact.

In humans, cutaneous disease is most common and a painless, black, indurated eschar frequently forms. Mortality from cutaneous disease is 20% if untreated whereas inhalational anthrax may have a mortality of 90% if untreated.

Inhalational anthrax is associated with a poor yield from sputum culture with the greatest yield from blood culture.
A 20-year-old Caucasian student returns from Ghana with a spiking temperature and nocturnal sweats. She has 0.5% of red blood cells infected with *Plasmodium falciparum*.

Which of the following is correct, as it relates to quinine therapy in this case?

(Please select 1 option)

- Glucose levels should be monitored in those being treated with quinine  
  - Correct

- Pregnancy is a contraindication for quinine

- Quinine is contraindicated in those taking mefloquine prophylactically

- Quinine must always be given parenterally initially

- The dose of quinine should be reduced in liver impairment

Severe malaria is indicated by more than 1% of RBC infected.

Hypoglycaemia is an important side effect of quinine therapy and should be monitored in those having intravenous quinine.

Intravenous infusion of quinine is reserved for severe or cerebral malaria (most deaths from *M. falciparum* occur in first 96 hours of starting treatment).

The initial dose should NOT be reduced in those severely ill with renal/hepatic impairment.

High doses of quinine in pregnancy are teratogenic in the first trimester. However, in malaria, the benefit of treatment outweighs the risk. [WHO Guidelines (2006)](https://www.who.int/chpr/disease/anti-malaria-drugs/en/) recommend artemisinins are the first line in the second and third trimester. In the first trimester, both artesunate and quinine are
considered treatment options. In severe malaria, any available treatment should be started without delay as both the mother and foetus’ life are in danger.
Work Smart

Question 5 of 164

Which of the following is correct regarding toxoplasmosis?

(Please select 1 option)

- Can present with fits in patients with AIDS
- Infection in the first trimester of pregnancy is seldom harmful to fetus
- Infection is usually by respiration
- Prophylactic immunoglobulins should be given to pregnant women if their IgM anti-toxoplasma antibodies detected
- Raw eggs are an important source of infection

Transmission of *Toxoplasma gondii* occurs after ingestion of cysts from contact with cat faeces or raw/undercooked meat. The definitive host is the cat.

Oocysts excreted with cat faeces can remain in soil for months.

First-trimester toxoplasmosis can cause IUGR, developmental delay (with intracerebral calcification), and hearing loss. Risk of fetopathy is reduced by more than 50% if spiramycin, which can prevent maternal-fetal transmission, is given to mothers (not prophylactic IgM).
Work Smart

Question 6 of 164

Which of the following does not lead to chronic liver disease?

(Please select 1 option)

- Alpha1 antitrypsin deficiency
- Cystic fibrosis  □ Incorrect answer selected
- Haemochromatosis
- Haemosiderosis  □ This is the correct answer
- Hepatitis C

Sixty percent to 80% of patients with hepatitis C develop chronic hepatitis and 20% of these will progress to cirrhosis.

Liver disease from chronic cholestasis occurs in cystic fibrosis.

Alpha1 antitrypsin deficiency causes both cirrhosis and emphysema.

Haemochromatosis is autosomal recessive and is characterised by excessive iron deposition in various organs causing organ failure (diabetes, heart failure, chronic liver disease, hypogonadism, skin pigmentation and arthritis).

Haemosiderosis usually arises due to parenteral iron overload, for example, in patients with aplastic anaemia after multiple transfusions. It is not commonly associated with cirrhosis. If cirrhosis does develop as a result of massive iron overload the condition is known as secondary haemochromatosis.
Reverse transcriptase-PCR is used to amplify which of the following?

(Please select 1 option)

- Antibodies
- DNA
- Plasmids
- Protein
- RNA [Correct]

Reverse transcriptase PCR is a means of amplifying ribonucleic acid (RNA).

The RNA is transcribed into complementary deoxyribonucleic acid (cDNA).

Using the enzyme reverse transcriptase, the cDNA is then amplified by conventional polymerase chain reaction (PCR).
Work Smart

Question 2 of 50

Which of the following is true of the antibiotic combination quinupristin and dalfopristin?

(Please select 1 option)

- Administered orally
- Effective against multi-resistant *S. aureus*  
  - Correct
- Effective against resistant mycobacterium TB
- Indicated in subjects with chronic renal impairment
- Particularly effective in the treatment of pseudomonas infection in cystic fibrosis

Quinupristin and dalfopristin are a synergistic combination of a streptogramin A and B respectively.

They are effective against Gram positive aerobes and are particularly useful against resistant *Strep. pneumoniae* and *Staph. aureus*.

They can only be administered via a central line.
A 18-year-old homosexual male developed progressive pneumonia not responding to antibiotics. Methenamine silver staining of the sputum showed small circular cyst and Giemsa staining demonstrated the small, punctate nuclei of the trophozoites and intracystic sporozoite.

Which is the most likely organism?

(Please select 1 option)

- Cryptococcus neoformans
- Leishmania donovani
- **Pneumocystis jirovecii** ✗ Correct
- Toxoplasma gondii
- Trypanosoma cruzi

The organism is *Pneumocystis jirovecii*.

The organism may be identified on microscopy after:

- methenamine silver staining for the cyst phase of the organism
- giemsa staining that demonstrates the small, punctate nuclei of the trophozoites and intracystic sporozoites, or
- fluorescence-tagged monoclonal antibody.
A 63-year-old female presents with a one day history of confusion with headaches. On examination she is confused, with a Glasgow coma scale of 13 and a temperature of 39.5°C. She has nuchal rigidity and photophobia. CSF examination reveals a glucose of 0.5 mmol/l (3.3-4.4), a white cell count of 2500 per mm and Gram positive cocci in pairs.

Which of the following is correct?

(Please select 1 option)

- A characteristic rash would be expected
- Nerve deafness would be a common complication in this case  
  - This is the correct answer
- Rifampicin should be given to close contacts  
  - Incorrect answer selected
- The most likely infective organism is *Staphylococcus aureus*
- The organism is likely to be penicillin resistant

This patient has pneumococcal meningitis, caused by the Gram positive coccus *Strep. pneumoniae*. This is the second commonest cause of bacterial meningitis (commonest in the elderly) and is associated with the highest mortality (20%) and highest morbidity, such as deafness which may occur in 50%.

Contacts do not require treatment and there is no rash associated with pneumococcal meningitis.
Meningococcus is Gram negative.
Work Smart

Question 3 of 50

Which of the following is the most common cause of traveller's diarrhoea?

(Please select 1 option)

- **Entamoeba histolytica**
- **Escherichia coli**  This is the correct answer
- **Giardia lamblia**  Incorrect answer selected
- **Shigella flexneri**
- **Yersinia enterocolitica**

Enterotoxigenic *E coli* is the commonest cause of traveller's diarrhoea and is usually a self-limiting condition.

Usually, no treatment or investigation is required for this brief diarrhoeal illness.

Other causes that may be associated with prolonged diarrhoea include *Giardia* and amoebiasis.

Chronic diarrhoea merits investigation.

Next question  Go to summary

Answer Statistics
Question 4 of 50

A 40-year-old single man returned from holiday in Europe with mild bloody diarrhoea which had lasted for two weeks.

He had lost 2.5 kg in weight, had occasional lower abdominal cramping discomfort and a painful swelling of his left knee.

Which is the most likely diagnosis?

(Please select 1 option)

- Amoebiasis
- Campylobacter infection **Correct**
- Crohn's disease
- Gonococcal septicaemia
- Ulcerative colitis

_Campylobacter_ infection is one of the commonest causes of inflammatory diarrhoea. Abdominal pain is often a prominent feature of the illness frequently localising to the right iliac fossa. Diarrhoea may be mild or very severe often with passage of blood. Symptoms may last a week or longer.

Reactive arthritis and Reiter's syndrome can develop following infection with a number of enteric pathogens including _Shigella_, _Salmonella_, _Campylobacter_ and _Yersinia_.

Further Reading:

A 45-year-old man returned from a two week trip in Zimbabwe.

Fourteen days later he presented with fever, sore throat, headaches and a widespread maculopapular rash.

On examination, there was generalised lymphadenopathy and a widespread maculopapular rash.

What is the most likely diagnosis?

(Please select 1 option)

- Acute HIV infection  □ Correct
- Schistomsomiasis
- Strongyloidiasis
- Tick typhus
- Typhoid fever

It is essential to exclude acute human immunodeficiency virus (HIV) in this case. Acute retroviral syndrome is said to occur in 60-80% of patients between two and 12 weeks following exposure to HIV.

Typical symptoms include fever, pharyngitis, lymphadenopathy and a widespread macular rash. The illness closely resembles infectious mononucleosis.

During seroconversion it is likely that the HIV antibody test will be negative; the diagnosis is made by polymerase chain reaction (PCR) of peripheral blood for HIV ribonucleic acid (RNA); in acute HIV the
viral load is very high.

"The time from exposure to onset of symptoms is usually 2-4 weeks, but the incubation may be as long as 10 months in rare cases\textsuperscript{1,3}. Typical symptoms in a review of 209 cases\textsuperscript{2} included fever (96%), adenopathy (74%), pharyngitis (70%), rash"

Reference:

Question 11 of 164

A 40-year-old man presented with pityriasis versicolor.

Which is the most appropriate treatment?

(Please select 1 option)

- Methotrexate
- Oral terbinafine
- Phototherapy with ultraviolet light (UVB) **Incorrect answer selected**
- Psoralen with ultraviolet light (PUVA) therapy
- Topical selenium sulphide **This is the correct answer**

Pityriasis versicolor (also called tinea versicolor) is a skin lesion caused by a fungus called *Malassezia furfur*.

The treatment is topical selenium sulphide.

Oral itraconazole is also effective.

Answer Statistics
Work Smart

Question 12 of 164

You review a 30-year-old HIV positive man with *Pneumocystis jirovecii* pneumonia (PCP).

Blood gases reveal a PO$_2$ of 55 mmHg (75-100) whilst breathing 28% oxygen.

Which of the following would be indicated in the treatment?

(Please select 1 option)

- Atovaquone
- Clindamycin
- Leucovorin
- Pentamidine
- Trimethoprim-sulphamethoxazole

This patient has severe PCP as suggested by the hypoxia (PO$_2$ less than 70). He should be treated with high percentage oxygen and the drug of choice is high dose IV co-trimoxazole (trimethoprim-sulphamethoxazole).

If allergic to co-trimoxazole, IV pentamidine or clindamycin are appropriate.

IV leucovorin and oral atovaquone are further options but are not first line therapies.

Prednisolone has been shown to reduce mortality substantially in patients with a PO$_2$ <60 mmHg.
Question 5 of 50

A 75-year-old man has a history of chronic lymphocytic leukaemia. He has had treatment with several courses of chemotherapy and has now been admitted to hospital with pneumonia.

His medical history revealed that he had suffered several previous upper respiratory tract infections over the previous six months.

Which of the following components of his immune system is likely to be deficient?

(Please select 1 option)

- Complement
- Immunoglobulin G
- Macrophages
- Mast cells
- T lymphocytes

Chronic lymphocytic leukaemia (CLL) is commonly complicated by panhypogammaglobulinaemia.

Although intravenous immunoglobulin prevents recurrent infections it does not prolong survival.
A 27-year-old man presents with fever, urethritis and arthralgia. He is found to have a swollen ankle with a pustular rash on the dorsal aspect of his foot. What is the most likely diagnosis?

(Please select 1 option)

- Disseminated gonorrhoea - Correct
- Lyme disease
- Reactive arthritis
- Staphylococcal arthritis
- Tuberculous arthritis

The most likely cause for this acute presentation is disseminated gonorrhoea - with a pustular rash on the dorsum of his foot, fever, urethritis and oligoarthritis.

Gonorrhoea is the second most common bacterial STI in the UK after chlamydia. It is caused by Neisseria gonorrhoeae, a Gram negative diplococcus. Transmission occurs by inoculation of infected secretions, with a typical incubation period of two to five days.

Primary infection is symptomatic in 90-95% of men, but only 50% of women. It typically presents with urethral or vaginal discharge, dysuria and abdominal pain. Anal and pharyngeal disease is usually asymptomatic. Spread can occur to involve the epididymis, prostate, endometrium and pelvic organs although this is rare (<10%).
Even less common is haematological dissemination, which results in skin lesions, arthralgia, arthritis and meningitis. There is an increased risk of acquiring HIV infection if you are infected with gonococcus.

Culture is the traditional first line diagnosis test, but rapid diagnosis can be undertaken using light microscopy of genital specimens to detect the bacteria.

Increasingly, nucleic acid amplification tests are used but if positive it should be followed by culture to confirm diagnosis and check antibiotic sensitivities. Treatment is with antibiotics depending on local sensitivities.

Lyme disease is caused by a tick-borne spirochaete, Borrelia burgdorferi. It is a multisystem inflammatory disease initially characterised by a spreading erythema migrans rash and can disseminate to the musculoskeletal, neurological or cardiovascular system. Stages of the disease have varying manifestations, but none would fit the description above.

Reactive arthritis, formally known as Reiter's syndrome, is an autoimmune condition that develops in response to an infection. Classically this is described as a triad of urethritis, conjunctivitis and arthritis. Precipitating infections include gastrointestinal organisms such as Salmonella and genitourinary infections, especially Chlamydia. Skin rash as described above is not typically present.

Staphylococcus and tuberculosis are both causes of septic arthritis. Patients are often systemically unwell and urethritis would not be expected.

Reference:
British Association for Sexual Health and HIV. National Guideline on the Diagnosis and Treatment of Gonorrhoea in Adults 2005.
Work Smart

Question 13 of 164

Four members of a football team develop diarrhoea due to *Salmonella enteritidis*.

Eating which food was the most likely source of the infection?

(Please select 1 option)

- [ ] Chicken at a fast food outlet 20 hours earlier [Correct]
- [ ] Fried rice at a takeaway 4 hours earlier
- [ ] Raw eggs in milk 6 hours earlier
- [ ] Raw oysters at a hotel 24 hours earlier
- [ ] Soft cheeses 48 hours earlier

The incubation time for *Salmonella enteritidis* is 12-48 hours and the likely sources are poultry and eggs.

Raw oysters are associated with infections such as the Norwalk agent.
A 25-year-old Turkish woman arrived in the United Kingdom with a three-month history of weight loss and intermittent fevers.

On examination, the patient was emaciated, febrile (39°C) and pale, and an enlarged liver (5 cm below the costal margin) and spleen (10 cm below the costal margin) were present.

Investigations revealed:

<table>
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<tr>
<th>Test</th>
<th>Result</th>
<th>Normal Range</th>
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</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>72 g/L</td>
<td>(115-165)</td>
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<tr>
<td>White cell count</td>
<td>$2.4 \times 10^9$/L</td>
<td>(4-11)</td>
</tr>
<tr>
<td>Platelet count</td>
<td>$117 \times 10^9$/L</td>
<td>(150-400)</td>
</tr>
</tbody>
</table>

Thick and thin films no parasites identified.

CXR normal.

What is the most likely diagnosis?

(Please select 1 option)

- HIV infection
- Infectious mononucleosis
- Malaria ✗ Incorrect answer selected
- Miliary tuberculosis
- Visceral leishmaniasis ✗ This is the correct answer
The clinical history given here is typical of visceral leishmaniasis.

Leishmaniasis is a vector-bourne disease caused by obligate intra-macrophage protozoa, transmitted to humans by phlebotomine sandflies. It is endemic in large areas of the tropics, subtropics and Mediterranean basin. There are four main clinical syndromes: cutaneous, mucocutaneous, visceral (also known as kala-azar) and post kala-azar dermal leishmaniasis.

In cutaneous leishmaniasis patients generally present with ulcers or nodules. These usually heal spontaneously, but slowly, in immunocompetent individuals with resultant disfiguring scars.

Mucocutaneous leishmaniasis is characterised by progressively destructive ulcerations of the mucosa extending from the nose and mouth to the pharynx and larynx, which are not self-healing. Leishmania braziliensis is responsible for the majority of these cases.

Post kala-azar dermal leishmaniasis is characterised by a macular, maculopapular or nodular rash and is a complication of visceral leishmaniasis frequently observed after treatment. It can also occur in immunosuppressed individuals and is highly infectious.

Visceral leishmaniasis, as described here, is fatal if left untreated. It is caused by the *Leishmania donovani* complex (*L. donovani* sensu stricto in East Africa and India, and *L. infantum* in Europe, North Africa and Latin America). Following an incubation period of 2-6 months, patients present with persistent systemic infection (fever, malaise, loss of appetite and weight loss) and parasitic infection of the blood and reticulo-endothelial system (resulting in lymphadenopathy and hepatosplenomegaly). Anaemia is usually caused by persistent inflammation and hypersplenism and can be exacerbated by bleeding.

Diagnosis can be difficult. Pancytopenia is often present and is supportive of the diagnosis. There is also often marked polyclonal hypergammaglobulinaemia. Visualisation of the parasite (amastigote form) from lymph nodes, bone marrow or spleen is used as a confirmatory test. PCR can be used to detect the parasite in the blood. Anti-leishmanial antibodies can be detected, but they remain positive up to several years after cure and therefore cannot be used to detect relapse. In addition, there is a significant incidence of asymptomatic infection, and therefore seroprevalence in healthy populations.

Treatment of visceral leishmaniasis relies on specific therapies and aggressive management of concomitant infection, anaemia, hypovolaemia and malnutrition. First line antimonials are sodium stibogluconate and meglumine antimoniate. Adverse effects include cardiac arrhythmias and acute pancreatitis. Amphotericin B is increasingly being used. Vaccines are being developed, and novel drugs (including miltefosine and paromomycin) have been introduced. An elimination programme has been introduced to the Indian subcontinent.

Whilst opportunistic infections in HIV can present like this, there are no other indications in the question to suggest this is the diagnosis.
The history is too long for infectious mononucleosis.

Malaria is not common in Turkey, and we are told there are no parasites seen (although remember 3 negative films are needed to exclude the diagnosis).

Miliary TB is a possibility but does not classically cause this level of hepatosplenomegaly.

References:

Work Smart

Question 15 of 164

A 30-year-old man developed a febrile illness three days after returning from a holiday in Thailand. He was admitted complaining of severe myalgia.

On examination, he was febrile (39°C) with a diffuse macular rash on the trunk. There was no lymphadenopathy.

Investigations revealed:

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Reference Range</th>
</tr>
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<td>Haemoglobin</td>
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<td>White cell count</td>
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<td>Serum total bilirubin</td>
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<td>(1-22)</td>
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<tr>
<td>Serum alanine aminotransferase</td>
<td>120 U/L</td>
<td>(5-35)</td>
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</table>

What is the most likely diagnosis?

(Please select 1 option)

- Acute HIV infection (seroconversion illness)
- Dengue fever  □ Correct
- Hepatitis E
- Secondary syphilis
- Typhoid
The symptoms are most consistent with dengue fever.

While acute retroviral syndrome (acute HIV) is associated with a widespread macular rash, it is also usually associated with pharyngitis and generalised lymphadenopathy.

Hepatitis E presents in a similar manner to hepatitis A, that is, as an acute febrile illness with jaundice.

The history is too acute for secondary syphilis, which is not typically associated with myalgia.

Typhoid fever is usually a diarrhoeal illness associated with subtle 'rose spots' on the abdomen.

Dengue fever is caused by an arthropod-borne Flavivirus. The disease has an incubation period of approximately seven days, followed by headaches and retro-orbital pain. Symptoms evolve rapidly and severe musculoskeletal pain is a prominent feature, with a maculopapular rash.
A 30-year-old renal transplant recipient presented with non-Hodgkin’s lymphoma.

Which virus is most likely to be of aetiological significance?

(Please select 1 option)

- Adenovirus
- Cytomegalovirus
- Epstein-Barr virus  □ Correct
- Herpes simplex type 1
- Varicella zoster

EBV-associated lymphoproliferative disease may occur in individuals with inherited or acquired immunodeficiency syndromes.

Approximately 1% of renal transplant recipients develop post-transplant lymphoproliferative disease (PTLD) in the first year following their transplant.
A 52-year-old woman was admitted with malaise and leg weakness.

Her illness started with a sore throat while travelling in eastern Europe.

On examination, she was febrile (39.1°C) with several areas of exudates on her pharynx and extensive cervical lymphadenopathy. There was weakness of the legs with absent tendon reflexes.

What is the most likely diagnosis?

(Please select 1 option)

- Acute myeloid leukaemia
- Cytomegalovirus infection
- Diphtheria ✅ This is the correct answer
- Glandular fever ☐ Incorrect answer selected
- Streptococcal tonsillitis

This history of severe exudative pharyngitis in a person who has recently travelled to eastern Europe is highly suggestive of diphtheria.

The disease, caused by *Corynebacterium diphtheriae*, causes a severe pharyngitis with extensive soft tissue swelling and lymphadenitis that produces a characteristic 'bull neck' appearance.

Exotoxins produced by the organism may cause myocarditis or neurological defects. The degree of neurological toxicity varies but may be severe, causing cranial neuropathies, predominantly motor peripheral neuropathy (occasionally sensory neuropathy).
An epidemic of diphtheria began in Russia in the early 1990s and remains a significant public health problem in Russia and in the former Soviet states.

Answer Statistics

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Times answered: 7623

Test Analysis

Correct: 1
Incorrect: 11
Partially Correct: 5
Correct

Score: 58.82%
Total Answered: 17

Feedback
A 19-year-old man returned to the United Kingdom two weeks after working in a refugee camp in sub-Saharan Africa.

On examination he was febrile, dyspnoeic and widespread inspiratory crackles were present. He had an extensive maculo-papular rash, conjunctivitis, generalised stomatitis and some bluish-grey spots on the buccal mucosa.

What is the most likely diagnosis?

(Please select 1 option)

- Epidemic typhus  □ Incorrect answer selected
- Epstein-Barr virus infection
- Leptospirosis
- Measles  □ This is the correct answer
- Parvovirus infection

Although seldom seen in countries in which a vaccine is available, measles is a major health problem in refugee camps in Africa.

The clinical picture described is characteristic.

The major complications of measles involve the respiratory tract and central nervous system.

Pneumonia may be caused by the virus itself or through bacterial superinfection.
Work Smart

Question 19 of 164

A 70-year-old woman developed herpes zoster ophthalmicus.

Which one of the following is most likely to be a complication of this condition?

(Please select 1 option)

- Hyphaema
- Keratitis ✓ Correct
- Keratoconus
- Posterior subcapsular cataract
- Scleromalacia

Keratitis due to varicella zoster virus (VZV) may subsequently lead to iridocyclitis and secondary glaucoma.
A 20-year-old-woman presented with a solitary, crusted, thickened lesion on her face one month after returning from a holiday in Central America.

What is the most likely diagnosis?

(Please select 1 option)

- Cutaneous anthrax
- Cutaneous leishmaniasis **Correct**
- Impetigo
- Leprosy
- Onchocerciasis

The patient has American ('New World') cutaneous leishmaniasis.

The causative agents are of the *Leishmania* species, including *L. braziliensis*, *L. mexicana*, *L. panamensis* and others.

The incubation period is very variable ranging from two weeks to several months.

A variety of clinical manifestations are described, including single or multiple lesions or mucosal disease (espundia). Lesions usually occur on sun-exposed areas.

Treatment is usually with pentavalent antimonial drugs.
Question 21 of 164

Which one of the following statements concerning T-lymphocytes is correct?

(Please select 1 option)

- Are infected by Epstein-Barr virus in infectious mononucleosis
- Are the primary host response in bacterial infection
- Compose the majority of lymphocytes in plasma
- Produce IgG
- T cell lymphoma has a better prognosis than B cell lymphoma

The primary host response to bacterial infections is dependent on mononuclear phagocytes and neutrophils.

T lymphocytes are involved in cell-mediated acquired immune responses, whereas B lymphocytes are involved in humoral immunity and produce immunoglobulins.

T lymphocytes compose the majority of circulating lymphocytes in plasma.

Epstein-Barr virus infects B lymphocytes and squamous epithelial cells of the oropharynx. The virus can transform B cells and epithelial cells to produce Burkitt's lymphoma, a subset of Hodgkin's lymphoma, nasopharyngeal carcinoma and oral hairy leukoplakia.

T cell lymphoma makes up about 10-20% of non-Hodgkin's lymphomas and has a worse prognosis than B-cell lymphoma.
Work Smart

Question 22 of 164

Twenty of 30 patients in an adult ward develop colicky abdominal pain and diarrhoea without vomiting between 21:00 and 01:00 hours.

Meat stew was served for lunch at noon.

Which of the following is the likely diagnosis?

(Please select 1 option)

- **Bacillus cereus**
- **Clostridium perfringens** ✔ This is the correct answer
- **Enterotoxigenic Escherichia coli**
- **Enterovirus**
- **Staphylococcus aureus** ✗ Incorrect answer selected

This food poisoning with no vomiting and an incubation period between 9-13 hours is typical of **Clostridium perfringens**.

The history is too long for a typical *Staph. aureus* infection (vomiting a typical feature, incubation period one to six hours) and rather short for enterovirus (24 hours).

*B. cereus* can cause two patterns of disease. The classic emetic form is caused by the ingestion of toxin and is characterised by nausea and vomiting, similar to *Staphylococcus aureus*. Rice products are generally the cause of this form.

The diarrhoeal form is caused by the ingestion of the organism, which releases toxin within the
stomach. This can produce an illness similar to *C. perfringens* with watery diarrhoea and abdominal cramps. Meats, milk, vegetables, and fish have been associated with this form of the illness. This form is much less common, and the incubation period is classically shorter (1-6 hours) and therefore in this case *C. perfringens* is much more likely to be the diagnosis.

*Escherichia coli* infection has an incubation period of 12-24 hours and is also associated with marked vomiting.

Supportive treatment is all that is generally required with symptoms resolving after 24 hours.

Score: 54.55%
Work Smart

Question 7 of 50

Which of the following is true concerning whooping cough (pertussis)?

(Please select 1 option)

- Is a greater threat to children during the second six months of life, after maternal antibody has declined, than during the first six months
- Is associated with convulsions less frequently than is the case with other febrile conditions
- Is characteristically associated with a polymorph leucocytosis
- The vaccine may lead to hemiplegia
- Rapidly resolves with antibiotic treatment

Whooping cough (pertussis) is caused by the bacterium *Bordetella pertussis*. *B. pertussis* is a very small gram-negative aerobic coccobacillus that appears singly or in pairs. Infection is characterised by paroxysms of coughing. Lymphocytosis is typically found.

The pertussis vaccine is estimated to be 63% to 94% effective in the diphtheria-pertussis-tetanus (DPT) shot. A rare complication is a hemiseizure-hemiplegia syndrome, which is thought to be related to post-immunisation hyperthermia rather than direct neurological toxicity.

The incidence of pertussis is highest in infants, but it is also seen in adolescents and adults. It is infants under the age of 3 months who are at the highest risk of severe complications, hospitalisation and death.

Febrile convulsions are seen with equal prevalence to other childhood infectious diseases.
Although it is a bacterial disease, antibiotics do not alter the clinical course once the disease is established. Erythromycin, clarithromycin and azithromycin may be given however as they have been shown to reduce the period the patient is infective for.

Answer Statistics

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Times answered: 8320

Test Analysis

Correct Incorrect Partially
Correct

Score: 57.14%
Total Answered: 7

Feedback
Work Smart

Question 23 of 164

Which of the following concerning *Corynebacterium diphtheriae* is correct?

(Please select 1 option)

- □ Can cause skin infection
- □ Correct
- □ Infection is often complicated by myocardial fibrosis after recovery from severe infection
- □ Is most unlikely to cause infection in an individual with a positive Schick test
- □ Mitis strain is generally more virulent than the intermedius strain
- □ Toxin is better absorbed through the anterior nasal than the pharyngeal mucosa

*Corynebacterium diphtheriae* is a Gram positive, non-spore-forming, pleomorphic bacteria that is also a facultative anaerobe. It causes diphtheria in humans. There are three recognised strains of *C. diphtheria*: gravis, intermedius, and mitis. Intermedius is thought to be the one most associated with the exotoxin and is more virulent than the mitis strain. Diphtheria is transmitted from person to person, with human beings the main reservoir. The Schick test involves the intradermal injection of a small amount of diphtheria toxin into the arm of a person. If positive a wheal develops, which indicates the patient is susceptible to diphtheria. It is no longer used in routine clinical practice in the UK.

Typically, diphtheria attacks the respiratory system, but may also affect the skin, conjunctiva, and external genitalia. Signs and symptoms include sore throat, fever, and swelling of lymph nodes in the neck and general malaise. As the disease progresses, diphtheria toxin is secreted. This destroys the membrane surface of the affected areas and replaces them with a greyish, tough, leathery
"pseudomembrane" made of dead tissue, leukocytes, and bacteria. The classical signs which may be described in examination questions include the dense grey pseudomembrane, which can occur in any portion of the respiratory tract (characteristically the posterior pharynx) and a 'bulls neck' which results from cervical lymphadenopathy and mucosal swelling.

Cutaneous diphtheria presents with non-healing ulcers covered with a grey membrane, which can develop bacterial co-infection. If isolated, the disease is indolent, but the ulcers can act as a reservoir which can subsequently lead to pharyngeal infection.

Anterior nasal diphtheria usually presents in a similar fashion to the common cold, as absorption of the toxin here is minimal. Pharyngeal, tonsillar, and laryngeal diphtheria results in higher absorption of toxin into the bloodstream and therefore more severe manifestations.

If absorbed systemically, the toxin can also affect the heart, nerves, and other organs in the body causing heart failure, nerve damage, or suffocation. Cardiac involvement is usually in the form of a cardiomyopathy and myositis, which is evident from the 10-14th day and may lead to arrhythmias. This accounts for 50% of deaths, but myocardial fibrosis affects a minority infected with diphtheria.

Management of suspected cases should include isolation, securing a definitive airway, cardiac monitoring, and erythromycin or penicillin promptly. Antitoxin is available in the USA.

Diphtheria is a notifiable disease in the UK.

Further Reading: Medscape. Diphtheria in Emergency Medicine.
Which of the following concerning IgG is correct?

(Please select 1 option)

- It comprises the majority of circulating antibody in serum
- It differs from other isotypes in not being able to cross the placental barrier
- It has a molecular weight of 50,000 kd
- It is monovalent

Normal range 8-19 g/L. Next is IgA, 1-5 g/L, followed by IgM 0.5-2 g/L.

It is, in fact, the only antibody capable of crossing the placental barrier, which it does through gaining attachment via its Fc portion.

Each light chain has a molecular weight (MW) of 25,000 and each H chain a MW of 50,000. Therefore, since the whole molecule consists of 2 L and 2 H chains, the MW is 150,000 kd.

It exists as a monomer with 2 F\text{ab} portions, each of which can interact with an antigenic determinant. Therefore it is divalent.

It is the major antibody produced in the secondary immune response. IgM is the major antibody produced during the primary response.
Work Smart

Question 8 of 50

Which of the following is true of cutaneous anthrax?

(Please select 1 option)

- Causes a black eschar which overlies pus
- Is very likely to occur in subjects exposed to anthrax spores
- Lesions are associated with marked oedema (Correct)
- Lesions are usually painful and tender
- Mortality is approximately 20% despite antibiotic therapy

Anthrax is caused by *Bacillus anthracis* a Gram positive rod.

Cutaneous anthrax is caused by direct contact of the bacteria into an open wound (usually touching an infected animal). Cutaneous anthrax is associated with a black eschar without pus, tends to be painless and to have widespread oedema.

Without antibiotics, mortality is of the order of 20%, but with antibiotics, mortality is low, which contrasts with pulmonary anthrax.

Further Reading:

Work Smart

Question 9 of 50

Which of the following is a feature of vancomycin-resistant enterococci?

(Please select 1 option)

- Are commonly vancomycin-dependent
- Cause resistant infective diarrhoea
- High dose ampicillin is the treatment of choice
- May be found in healthy community volunteers not recently hospitalised
- Produce an enzyme that inactivates vancomycin

Only some strains are vancomycin-dependent. An explanation for this curious process is that there is an inability to produce cell walls because the vancomycin-sensitive precursor genes have been turned off and the resistant ones only appear in the presence of vancomycin.

When they cause clinical problems they are usually urinary tract infections (UTI), bacteraemia, wound infections, neonatal infections, endocarditis, etc. rather than resistant infective diarrhoea.

Ampicillin is the treatment of choice only if the MIC (minimum inhibitory concentration) of ampicillin is not too high. Anecdotal evidence exists for its use in *E. faecalis* endocarditis. (20 g/day).

Vancomycin-resistant enterococci may be found in healthy community volunteers not recently hospitalised. Two percent in the United Kingdom general practice, 28% in Belgium. Community reservoir in meat, poultry and perhaps cheese.

Vancomycin-resistant enterococci alter peptidoglycan precursors used to build cell walls. Vancomycin
binds to D-ala-D-ala but the resistant enterococci have D-ala-D-lac or D-ala terminating precursors. They acquire genes that produce enzymes to change the precursors.

Reference:
Affinity maturation of an ongoing immune response is a feature of the antibody response. There is no evidence that a similar process occurs in the T cell response.

T cells recognise antigen only when presented by (self) MHC molecules on an antigen presenting cell.

MHC class II molecules present antigen to CD4+, alpha/beta+ T cells. It is still not clear how gamma/delta+ T cells recognise antigen, however, most gamma/delta+ T cells do not appear to be restricted by (self) MHC molecules.

Major histocompatibility complex (MHC) molecules present short antigen-derived peptides, not the intact antigen.

Additional 'costimulatory' signals are required to activate a resting T cell. Interaction of the T cell
reactor (TcR) of a resting T cell with an appropriate Ag/MHC complex in the absence of costimulatory
signals may lead to the induction of anergy.
Question 10 of 50

A 25-year-old male homosexual is admitted with dyspnoea and weight loss of two months duration.

He is diagnosed with *Pneumocystis jiroveci* as a consequence of HIV infection.

Which of the following concerning *Pneumocystis jiroveci* is true?

(Please select 1 option)

- Elevated serum antibodies to *P. jiroveci* are helpful diagnostically
- It is always associated with x ray changes
- It is best treated with intravenous pentamidine
- It is caused by a bacterium
- May have an extra pulmonary presentation

Although rare, *Pneumocystis jiroveci* can present in a number of extrapulmonary locations. These include the central nervous system, bone marrow, lymph nodes, eyes, thyroid and gastrointestinal tract. This can result in pancytopenia, retinal cotton wool spots and thyroid masses.

There is polyclonal B-cell activation in AIDS.

5-15% have a normal chest radiograph.

It is best treated with intravenous cotrimoxazole not intravenous pentamidine.

It is caused by a fungus, not a bacterium.
Work Smart

Question 11 of 50

Which of the following is true of tetanus?

(Please select 1 option)

- Cephalic tetanus causes severe dysphagia [This is the correct answer]
- Clostridium-specific intravenous immunoglobulin is of no benefit once spasm has started
- Failure to culture Clostridium tetani from the wound would make the diagnosis doubtful
- Infection confers lifelong immunity [Incorrect answer selected]
- There is a characteristic EEG

Cephalic means involving the cranial nerves usually from a wound on the head and neck. It may be confused with rabies but hydrophobia never occurs.

While Clostridium-specific intravenous immunoglobulin is ineffective once the toxin is attached to nervous tissue it may prevent progression.

The absence of a wound does not exclude tetanus.

Patients need to be actively immunised after recovery.

The toxin tetanospasmin does not cross the blood-brain barrier, it diffuses through the blood to bind to receptors containing gangliosides on the neuronal membranes of presynaptic nerve terminals in muscles. The toxin does reach the brain by axonal transport.
A 16-year-old boy from India presents with fever of four months duration and splenomegaly.

What is the most likely diagnosis?

(Please select 1 option)

- Coccidioidomycosis
- Giardiasis
- Tropical sprue
- Typhoid
- Visceral leishmaniasis  □ Correct

Visceral leishmaniasis (kala-azar) is an endemic disease in several regions of India and sub-Saharan Africa. It is caused by the parasite *Leishmania donovani* and spread by *Phlebotomus* sandflies.

Leishmaniasis is common in immune-suppressed patients, particularly those infected with HIV. In 2011 there was a substantial increase of cases in the Mediterranean region. It has been estimated that 15% of HIV-positive drug users in Spain are infected with *Leishmania donovani infantum*.

Giardiasis and tropical sprue present with gastrointestinal symptoms and malabsorption.

Typhoid is an acute illness.

Coccidioidomycosis is largely confined to the Americas. Most patients present with pulmonary symptoms although the disseminated disease can occur particularly in the immune-suppressed.
Question 27 of 164
Which of the following is true of Koplik's spots?

(Please select 1 option)

- Appear as red papules on the palmar surface of the hands
- **Diagnostic of measles**
- Located opposite the incisor teeth
- Only appear when fever is over 39°C
- Typically appear two days after the rash

Koplik's spots are small, irregular, bright red spots with blue-white centres, occurring on the inside of the cheek next to the premolars.

Seen only in measles, they are diagnostic.

The spots usually occur briefly after the fever begins and a couple of days before the generalised rash appears. Not infrequently, the spots disappear as the eruption develops.
A 28-year-old male presents with a four-day history of profuse bloody diarrhoea after returning from a holiday in the Far East.

Which of the following regarding his illness is true?

(Please select 1 option)

- A negative amoebic fluorescent antibody test excludes a diagnosis of acute amoebic dysentry
- Cysts to *E. histolytica* in the stools are only seen in acute amoebic dysentry
- Cholera is a likely diagnosis
- Giardiasis is a likely diagnosis
- Shigellosis is a likely diagnosis  □ Correct

Shigellosis is a possible cause of profuse bloody diarrhoea as cholera and giardiasis are associated with watery diarrhoea.

Trophozoites and cysts are seen in acute amoebic dysentery, however, cysts may also be excreted in asymptomatic carrier states.
Work Smart

Question 28 of 164

Regarding pneumonia caused by *Legionella pneumophila*, which of the following is true?

(Please select 1 option)

- ![ ] Is associated with hyponatraemia  □ Correct
- ![ ] Is best treated with intravenous amoxicillin and clavulanic acid
- ![ ] Is common in AIDS patients
- ![ ] Is readily diagnosed by standard aerobic culture of sputum
- ![ ] Should be managed on the ward in a respiratory isolation cubicle

*Legionella pneumophila* is a Gram negative bacillus that is ubiquitous in the environment.

Human infection occurs when a sufficient inoculum of bacteria are aerosolised and inhaled. It usually affects middle-aged and elderly patients, often with underlying lung disease. It is more common in men (3:1).

A variety of environmental sources have been identified as reservoirs of Legionella and have been responsible for infection in humans, including air conditioners, humidifiers, shower units and hot tubs. Other factors that predispose to infection include smoking, alcoholism, old age, chronic illness and immunosuppression. It is not common in AIDS, but in severe disease, there is an increased risk.

The infection causes a flu-like illness with a dry cough, headache, confusion and delirium. Gastrointestinal upset is common, with diarrhoea and ileus. Focal neurological signs can develop. Bloods often show a normal white cell count with lymphopenia (with or without thrombocytopenia, or
Pancytopenia). Sodium is often low, due to a syndrome of inappropriate antidiuretic hormone. 50% of patients have abnormal renal and liver function, and acute kidney injury can develop. Creatinine kinase can be raised.

Legionellae do not grow on standard culture media, but require specific supplemented media; they grow best at a low pH. Diagnosis is most commonly with antigen testing in the urine, but direct fluorescent antibody staining or serology can be used.

Erythromycin or clarithromycin are the antibiotics of choice; alternatives include doxycycline, cotrimoxazole or ciprofloxacin.

Further Reading:
Medscape. Legionnaires Disease.
Question 29 of 164

Which of the following statements concerning zoonotic diseases is true?

(Please select 1 option)

- Brucellosis is characterised by neutrophil leucocytosis
- Brucellosis is a recognised cause of spondylitis
- Serological evidence of toxoplasmosis is rare in adults
- Toxoplasmosis causes vasculitic anterior uveitis
- Toxoplasmosis causes visceral larva migrans

Brucellosis is a zoonosis, spreading from infected animals particularly cattle. There are four species: melitensis, abortus, suis, and canis.

Pasteurisation of milk has dramatically decreased the incidence in the UK.

*Brucella* are Gram negative bacilli which are fastidious. There is usually a history of exposure, and the symptoms are rather non-specific with fever, malaise, arthralgia and depression. Thirty five per cent have hepatosplenomegaly.

Leukopaenia is common, and 75% have a positive blood culture (90% of bone marrow cultures will be positive).

*Toxoplasma* is most frequent in farming communities where contact occurs with cats, and patients eat raw meat. Clinical manifestations include:
• Focal choroidoretinitis
• Granulomatous uveitis
• Optic atrophy
• Retinal detachment
• Cataract
• Posterior uveitis
• Glaucoma.
Work Smart

Question 30 of 164

Regarding the epidemiology of infections, which of the following statements is true?

(Please select 1 option)

- Diphtheria has been eradicated in most parts of the world.
- Polio has been eradicated in most parts of the world. □ Correct
- Resistant vivax malaria is a major problem in Kenya.
- Tetanus has been eradicated in most parts of the world.
- The AIDS epidemic seems to be declining worldwide.

Falciparum is the major resistance problem in sub-Saharan Africa.

Most vivax is chloroquine sensitive, though resistant strains are appearing in New Guinea and Indonesia.

Diphtheria is still prevalent in many parts of the world.

An upsurge in polio is now nearing eradication.

Tetanus is still common.

AIDS is increasing inexorably.
Molluscum contagiosum is caused by a deoxyribonucleic acid (DNA) pox virus.

The lesions are small, skin coloured papules with central umbilication. There is little surrounding inflammation and they may be spread following scratching to other sites.

Chickenpox lesions in the early stages may be mistaken for molluscum. However, the presence of associated macules and later vesicles and pustules help to differentiate them.

These lesions also affect the mucus membranes, and usually disappear within a few weeks, while molluscum can persist for up to a year.

© 2002 Dr Colin Melville
Which statement regarding tinea capitis is correct?

(Please select 1 option)

- It is effectively treated with topical nystatin ointment
- It is most commonly caused by the fungus *Trichophyton tonsurans*  □ Correct
- It often results in permanent alopecia
- Its presence should suggest immunological deficiency
- Usually causes patches that fluoresce dull green under Wood's lamp

Tinea capitis is a dermatophyte infection of the scalp. There are a number of causative organisms, but currently, in the UK and USA is most often caused by *Trichophyton tonsurans*, and occasionally by *Microsporum canis*. It is commonest in areas of socio-economic deprivation.

There is initially a small papule at the base of the hair follicle which spreads peripherally forming a scaly circular plaque (ringworm) within which there are brittle, broken infected hairs (exclamation mark hairs).

Confluent patches of alopecia develop and there may be pruritus. Sometimes a severe inflammatory response produces an elevated boggy granulomatous mass (kerion), studded with sterile pustules. There may be fever and regional lymphadenopathy, and occasionally permanent scarring and alopecia may result.

The crusted patches fluoresce dull green under Wood's light if caused by *Microsporum canis*, but do
not fluoresce if caused by *Trichophyton tonsurans*. Microscopic examination of a potassium hydroxide (KOH) preparation shows tiny spores and the fungi may be grown in Sabouraud medium with antibiotics.

Oral griseofulvin for two to three months is required, or ketoconazole for resistant cases.

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Question 33 of 164

Which is true regarding eczema herpeticum?

(Please select 1 option)

- Is invariably fatal if untreated
- Is more severe in reactivation disease

- Is typically associated with a high fever for over a week
  - This is the correct answer

- Only a single crop of vesicles usually appear
  - Incorrect answer selected

- Usually has an indolent onset

Eczema herpeticum is the result of primary infection of eczematous skin with *Herpes simplex* virus (HSV). The severity varies from mild to fatal.

There is usually an abrupt onset with crops appearing over seven to nine days. These may become coalesced. Typically, the child has a high fever for seven days, and recurrent attacks can occur.

Death can result from physiological disturbances (loss of fluid electrolytes and protein through the skin) or dissemination of the virus to the brain and other organs or from secondary bacterial sepsis.

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A young teenager presents with fever and headache. He has received oral amoxicillin for three days.

Which of the following findings would virtually exclude a partially treated bacterial meningitis?

(Please select 1 option)

- A CSF glucose of 45% of blood glucose
- A negative CSF culture
- A negative CSF Gram stain
- A negative Kernig's sign
- A CSF white cell count of 3

The assessment of children with suspected bacterial meningitis who have already received antibiotic therapy from their GP is a common diagnostic problem.

Partial treatment may reduce the incidence of positive CSF Gram stains to less than than 60%, and it also reduces the ability to grow the bacteria, particularly meningococcus.

CSF glucose, protein, neutrophils and bacterial antigen testing or polymerase chain reaction (PCR) should be completely unaffected. A normal white cell count would make the diagnosis very unlikely.

In normal CSF the glucose is usually >65% of blood glucose.

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Question 13 of 50

Which of the following forms of encephalitis is caused by a neuroimmunological response?

(Please select 1 option)

- Cytomegalovirus
- Enteral viruses
- Herpes simplex
- HIV infection
- Measles

Encephalitis may be caused by:

- Direct invasion by a neurotoxic virus (encephalitis)
- Post-infectious encephalopathy: delayed brain swelling because of an immunological response to the antigen, i.e. a neuroimmunological response
- Slow virus infection, for example, human immunodeficiency virus (HIV) or subacute sclerosing panencephalitis (SSPE).

Direct infection is most commonly caused by enteral viruses, herpes simplex virus (HSV) 1 and 2, varicella, cytomegalovirus (CMV), and Epstein-Barr virus (EBV).

It is also occasionally caused by respiratory viruses, human herpes virus 6 (HHV6), rubella, or mumps.
A post-infectious illness may also be caused by measles or varicella zoster (cerebellar ataxia).

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Times answered: 8765

Test Analysis

Correct Incorrect Partially Correct

Score: 61.54%
Total Answered: 13

Feedback
Regarding diphtheria which of the following statements is correct?

(Please select 1 option)

- About 50 cases per year are seen in the UK
- It is characterised by an inflammatory exudate forming a greyish membrane on the buccal mucosa
- It is predominantly spread from cutaneous lesions
- It produces a toxin which affects the myocardium, nervous and adrenal tissues
- Three doses of toxoid provides 75% protection

Diphtheria is spread by droplets, through contact with soiled articles (fomites), and, in areas of poor hygiene, from cutaneous spread.

The inflammatory exudate forms a greyish membrane on the tonsils and respiratory tract which may cause respiratory obstruction.

Incubation is between two and five days, and patients may be infectious for four weeks.

The toxin affects the myocardium, nervous and adrenal tissues.

The immunisation has been tremendously successful, and most cases seen in the United Kingdom are imported from the Indian subcontinent or Africa.

Recently, there has been a worrying epidemic of diphtheria in Russia and the newly independent
states of the former Soviet Union. In 1995, 52,000 cases and 1,700 deaths were reported.

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Times answered: 7122

Score: 54.29%
Total Answered: 35
Work Smart

Question 14 of 50

You are an occupational health physician and have been asked by an anxious employee about contraindications to pertussis immunisation.

Which of the following is a contraindication?

(Please select 1 option)

- Cow's milk protein intolerance.
- Eczema
- Fever to 39.5°C following the first dose. □ This is the correct answer
- Hydrocephalus □ Incorrect answer selected
- Redness of >2.5cm at the injection site after the first dose.

True contraindications to pertussis immunisation include:

- Acute illness - until recovered
- Previous reaction to pertussis:
  - Local: an extensive area of redness and swelling which becomes indurated, involving most of the anterolateral surface of the thigh or a major part of the circumference of the upper arm
  - General: fever equal to or more than 39.5°C within 48 hours of vaccine, anaphylaxis, bronchospasm, laryngeal oedema, generalised collapse, prolonged hypo responsiveness, prolonged inconsolable or high-pitched screaming of more than four hours, convulsions or
encephalopathy occurring within 72 hours.

A personal family history of allergy is not a contraindication, nor are stable neurological conditions such as cerebral palsy or spina bifida.

In patients who have had a previous reaction, immunisations should be completed with DT vaccine, and acellular vaccine considered.

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Answer Statistics

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Times answered: 8315

Test Analysis

Correct Incorrect Partially
Correct

Score: 57.14%
Work Smart

Question 15 of 50

You are considering starting a patient on griseofulvin.

Which of the following statements concerning its pharmacology is true?

(Please select 1 option)

- It is active against aspergillus
- It is active against *Candida albicans*
- It is associated with drug-induced Stevens-Johnson syndrome  □ This is the correct answer
- It should not be used in renal failure  □ Incorrect answer selected
- It used for a maximum of two weeks

Many drugs are implicated in causing Stevens-Johnson syndrome.

Griseofulvin is not active against *Candida albicans*. It is active against trichophytons (tinea) and other dermatophytes.

It is metabolised in the liver (note also it's an enzyme inducer). Only 0.1-0.2% excreted in urine.

Treatment with griseofulvin is often needed for a long period, sometimes years, depending on the rate of nail growth.

Further Reading:

A 41-year-old African man has a history of multiple episodes of sudden onset of severe abdominal pain and back pain lasting for hours. Each time this happens, his peripheral blood smear demonstrates numerous sickled erythrocytes.

A haemoglobin electrophoresis shows:

<table>
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<th>Hgb S</th>
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<td>Hgb F</td>
<td>5%</td>
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<td>Hgb A2</td>
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He now has increasing pain in his right groin radiating to the anterior aspect of the thigh and to the knee. His temperature was 38°C and examination of his hip revealed pain on internal rotation. A radiograph reveals irregular bony destruction of the femoral head.

What is the organism most likely to be responsible for these findings?

(Please select 1 option)

- Candida albicans
- Clostridium perfringens
- Group B Streptococcus
- Salmonella species
- Yersinia pestis

- This is the correct answer
- Incorrect answer selected
Salmonella osteomyelitis is seen in patients with sickle cell anaemia.

Other organisms that are frequent causes for osteomyelitis with sickle cell anaemia include *Staphylococcus aureus* and Gram negatives such as *Klebsiella*.

Why *Salmonella* species predominate in patients with sickle cell disease instead of *Staphylococcus aureus* is a matter of debate.

Reference:

Question 36 of 164

A 19-year-old male student attends the Emergency Department complaining of an urethral discharge one week after having casual unprotected sex.

Gram stain shows numerous neutrophils, some of which contain Gram negative intracellular Diplococci. The patient is treated with ceftriaxone, 250 mg as an intramuscular injection. Five days later, the patient re-attends with persisting discharge.

Which of the following is the most likely cause of this discharge?

(Please select 1 option)

- Chlamydia trachomatis □ Correct
- Penicillin-resistant Neisseria gonorrhoeae
- Re-infection with Neisseria gonorrhoeae
- Ureaplasma urealyticum
- Urethral stricture

Gonorrhoea is one of the commonest reported STDs in both men and women. In men, the symptoms manifest as urethritis and in women cervicitis or urethritis.

This patient has been adequately treated for gonorrhoea and a persistent discharge would be unusual unless there is antibiotic resistance in which case a culture assay will help to determine sensitivities.

More commonly patients present with co-infection with Chlamydia trachomatis.
In this case, the patient is likely to have a non-specific urethritis (NSU) due to *Chlamydia trachomatis*, requiring treatment with either doxycycline or erythromycin for 7-14 days.

**Answer Statistics**

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Times answered: 8068

**Test Analysis**

Correct Incorrect Partially Correct

Score: 55.56%
Total Answered: 36

Feedback
Work Smart

Question 37 of 164

Which of the following is correct regarding human varicella zoster immunoglobulin (VZIG)?

(Please select 1 option)

- Is invariably protective against severe varicella
- Is recommended for all patients with eczema exposed to chickenpox
- Is used to treat severe chicken pox infection
- Should be given to a 6 week old baby whose mother has developed chickenpox
- Should be given to an 18 week pregnant non-immune female who has been exposed to a case of chickenpox

Correct

Varicella has a secondary infection rate in household contacts of 90%. It is commonest in spring time, and the incubation period is 14-21 days. It shares the herpes virus family properties of latency and reactivation (zoster).

Risks to the fetus and neonate relate to the time of infection:

- Less than 20 weeks pregnancy: congenital varicella (limb hypoplasia, microcephaly, cataracts, growth retardation, skin scarring). High mortality.
- Second to third trimester: herpes zoster in an otherwise healthy infant.
- Minus seven days to plus seven days after delivery: severe and even fatal disease (30% mortality).

Varicella zoster immunoglobulin is prepared from pooled plasma of UK blood donors with a history of
recent chickenpox or herpes zoster.

Being an immunoglobulin, it is a protein concentrate and should be stored between 2°C and 8°C. Donors are screened for HIV, hepatitis B and hepatitis C.

VZIG prophylaxis is recommended for patients who fulfil all the following criteria:

- A clinical condition that increases the risk of severe varicella, (for example, immunosuppression, neonates, pregnant women)
- No antibodies to varicella zoster
- Significant exposure to chickenpox or herpes.

VZIG prophylaxis is of no benefit if chickenpox has already developed.

Severe or fatal varicella can occur despite VZIG prophylaxis. Active immunisation should, therefore, be used for susceptible immunosuppressed patients at long-term risk.

Clinical chickenpox occurs in 50% of those who receive VZIG prophylaxis, and 10% more will be affected sub-clinically.

Further Reading:

Work Smart

Question 17 of 50

Which of the following is correct regarding infection with *Salmonella typhi*?

(Please select 1 option)

- Children are particularly likely to become carriers
- Faecal culture is almost always positive during the first week of illness
- Most carriers are female
- Relapse does not occur if antibiotics are taken for two weeks
- Vaccinated individuals who develop the disease will have a mild illness

---

Children are rarely chronic carriers of the organism although for some unknown reason females are more commonly long term carriers than males (remember Typhoid Mary).

Faecal culture is positive in only 50% of cases during the first week of illness.

The gallbladder may act as a reservoir of infection and cause relapse in individuals treated with antibiotics. Cholecystectomy may be indicated.

Vaccinated individuals who develop the disease will have a higher threshold but the same disease.
Question 38 of 164

Which of the following is correct regarding herpes simplex encephalitis?

(Please select 1 option)

- ☐ Is associated with a polymorphonuclear pleocytosis in the CSF  ☑ Incorrect answer selected
- ☑ Produces a diffuse, evenly distributed inflammation of cerebral tissues
- ☑ Produces a typical EEG pattern with lateralised periodic discharges at 2 Hz  ☐ This is the correct answer
- ☐ Should be treated with aciclovir as soon as the diagnosis is confirmed by urgent CSF viral antibody titres
- ☐ Shows a peak incidence in the autumn

This EEG pattern is seen but is not diagnostic.

Winter is the peak incidence.

A lymphocytosis is characteristic in the cerebrospinal fluid (CSF).

Temporal lobe location is typical, not diffuse.

Immediate treatment is required on clinical suspicion - do not wait!
Work Smart

Question 18 of 50

Which of the following statement is true of infections with *Mycobacterium tuberculosis*?

(Please select 1 option)

- [ ] A positive tuberculin test indicates active disease
- [ ] In pregnant women treatment should not be given until after delivery
- [ ] Lymph node positive disease requires longer treatment than pulmonary disease
  - Incorrect answer selected
- [ ] Non-sputum producing patients are non-infectious
  - This is the correct answer
- [ ] Pyrazinamide has high activity against active extracellular organisms

Only untreated smear-positive pulmonary TB is likely to be infectious. Active disease may be indicated by grade III/IV response to tuberculin. Eighty percent of individuals with a history of BCG vaccination have grade I/II response.

All forms of pulmonary TB may be treated equally except tuberculous pleural effusion which may require drainage (with large effusions causing breathlessness) and adjunct corticosteroids to delay reaccumulation.

The length of treatment for other forms are:

- bone TB - 9 months
- meningitis - 1 year
- drug resistance - 2 years.
Streptomycin has high activity against extracellular organisms whilst pyrazinamide have high activity against intracellular organisms.

Answer Statistics

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Times answered: 8333

Test Analysis

Correct Incorrect Partially Correct

Score: 44.44%
Total Answered: 18
### Work Smart

**Question 19 of 50**

Which of the following statements is true of psittacosis (ornithosis)?

(Please select 1 option)

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<tbody>
<tr>
<td>☐</td>
<td>Infection responds rapidly to penicillin therapy</td>
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<tr>
<td>☐</td>
<td>It does spread from person to person [Correct]</td>
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<tr>
<td>☐</td>
<td>It is more of a risk to children than to adults who are exposed to birds</td>
</tr>
<tr>
<td>☐</td>
<td>It is only a risk from contact with psittacines (parrots), not other birds</td>
</tr>
<tr>
<td>☐</td>
<td>It usually causes many polymorphs to be present in the sputum</td>
</tr>
</tbody>
</table>

*Chlamydia psittaci* is endemic in birds including psittacine birds, canaries, finches, pigeons and poultry.

Pet owners, vets and zoo keepers are most at risk. It is rare in children.

Person to person transmission occurs, especially in a hospital environment.

Sputum Gram stain reveals a few leucocytes and no predominant bacteria. There are few signs and few laboratory/x ray findings.

Positive serology is with complement-fixing antibodies.

It is treated with tetracycline.
Non-bacterial thrombotic endocarditis (marantic endocarditis) is due to platelet-fibrin thrombi that are prone to embolising.

This form of non-infective endocarditis can be seen in persons who are very debilitated or who have a hypercoagulable state.

The deposition of fibrin on valve leaflets causes sterile vegetations that can embolise.
A 40-year-old man has had decreased mentation with confusion as well as increasing incoordination and loss of movement in his right arm over the past six weeks.

An MRI scan shows 0.5 to 1.5 cm lesions in cerebral hemispheres in white matter and at the grey-white junction that suggest demyelination.

A stereotactic biopsy is performed, and immunohistochemical staining of the tissue reveals JC papovavirus in oligodendrocytes.

Which of the following laboratory test findings is most likely to be associated with these findings?

(Please select 1 option)

- CD4 lymphocyte count of 90/microlitre
- HbA1c of 84 mmol/mol (9.8%)
- HDL cholesterol of 0.7 mmol/L
- Oligoclonal bands in CSF
- Serum sodium of 110 mmol/L

The findings are those of progressive multifocal leukoencephalopathy (PML), which is a condition that can develop in immunocompromised patients, such as those with AIDS.

PML is associated with papova (JC) virus infection.
Question 21 of 50

A 43-year-old woman develops a progressive, ascending motor weakness over several days. She is hospitalised and requires intubation with mechanical ventilation. She is afebrile. A lumbar puncture is performed with normal opening pressure and yields clear, colourless cerebrospinal fluid (CSF) with normal glucose, increased protein, and cell count of 5/microlitre, all lymphocytes. She gradually recovers over the next month.

Which of the following conditions most likely preceded the onset of her illness?

(Please select 1 option)

- Ketoacidosis
- *Staphylococcus aureus* septicaemia
- Systemic lupus erythematosus
- Viral pneumonia  □ Correct
- Vitamin B₁₂ deficiency

She has Guillain-Barré syndrome often preceded by an episode of infection such as viral (cytomegalovirus [CMV]) or bacterial (*Campylobacter*).
Question 40 of 164

A 50-year-old man presented to hospital feeling generally unwell for three days.

He had returned from a business trip to Thailand six weeks previously and had taken mefloquine as prophylaxis against malaria.

On examination he was afebrile, temperature 36.5°C, pulse was 100/minute and regular, his BP was 85/60 mm Hg.

Investigations showed:

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<th>Value</th>
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<td>WBC</td>
<td>19.0 ×10⁹/L</td>
<td>(4-11)</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>18.0 ×10⁹/L</td>
<td>(1.5-7.0)</td>
</tr>
<tr>
<td>AST</td>
<td>72 U/L</td>
<td>(1-31)</td>
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<tr>
<td>Alkaline phosphatase</td>
<td>255 U/L</td>
<td>(45-105)</td>
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</table>

What is the most likely diagnosis?

(Please select 1 option)

- Acute HIV infection (seroconversion illness) - Incorrect answer selected
- Dengue fever
- Gram negative bacteraemia - This is the correct answer
- Hepatitis B
Mefloquine-induced hepatitis

This is a difficult question.

The neutrophilia essentially excludes most viral causes.

The presentation is not typical of acute human immunodeficiency virus (HIV) (fever, pharyngitis, rash and lymphadenopathy).

Mefloquine can cause abnormal liver function tests but is not common.

Even though the patient is afebrile, the likeliest diagnosis is, therefore, Gram negative bacteraemia.

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**Answer Statistics**

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**Test Analysis**

Correct | Incorrect | Partially Correct

Correct
Work Smart

Question 41 of 164

A 50-year-old man comes to clinic and asks for advice about his risk of infection.

Twenty years ago he had been involved in a road traffic accident and had sustained a splenic laceration, requiring an emergency splenectomy.

Which of the following options offers the best advice?

(Please select 1 option)

☐ He does not need prophylactic antibiotics due to the amount of time that has elapsed since his surgery

☐ He has no increased risk of acquiring malaria when travelling to an endemic region

☐ He has no increased risk of infection since he has been well for 20 years following surgery

☐ He should receive pneumococcal vaccine  Correct

☐ There is no increased risk of infection in patients who undergo splenectomy due to trauma

Splenectomised patients are at increased risk of infection with encapsulated bacteria and infections that are filtered by the spleen (for example, malaria). Classically, the teaching has been that they are therefore required to take lifelong prophylactic antibiotics (often penicillin V). In current clinical practice, the need for such antibiotics is being questioned as there is a risk of bacterial resistance (especially if there is poor adherence) and side effects. Patients who are not felt to be at high risk of infection can be counselled regarding the risks and benefits of antibiotics and may choose to discontinue them. However, time is not usually a factor taken into account when assessing risk and therefore option 4 is a better choice than option 1.
When elective splenectomy is planned, vaccines to pneumococcus and meningococcus should be given two weeks pre-surgery to allow an antibody response to evolve.

Patients who have emergency splenectomies should be vaccinated post-operatively, though the response may not be as efficient.
Work Smart

Question 42 of 164

A 45-year-old woman was diagnosed with bacterial endocarditis.

What is the characteristic fundoscopic feature of this disease?

(Please select 1 option)

- Cherry red macula
- Janeway lesions
- Macular
- Retinal artery aneurysms
- Roth's spots  □ Correct

Roth's spots are the fundoscopic hallmark of bacterial endocarditis. They are white-centred retinal haemorrhages, caused by capillary fragility. In addition to subacute bacterial endocarditis, they can also be seen in leukaemia and retinal ischaemia.

Other peripheral features of endocarditis include Osler's nodes (tender subcutaneous nodules caused by immune complex deposition), and Janeway lesions (painless erythematous or haemorrhagic macular or papular lesions, on the palms and soles, caused by infective emboli in the skin).

A cherry-red spot on the macular is characteristic of central retinal artery occlusion. It is seen due to the relative pallor of the surrounding retina.

A macular star is caused by deposits of hard exudate (usually lipid) within the fibre layer of the retina, radiating out in a star-like pattern. It can occur in a number of conditions, including hypertensive
retinopathy and neuroretinitis.

Retinal artery aneurysms develop with age and can be associated with hypertension. They are usually benign but can result in macular haemorrhage, exudate or oedema, or vitreous haemorrhage.
A 35-year-old man returned from a two-week holiday complaining of pain in the loins and painful, swollen knees.

On examination, he was afebrile and had significant bilateral knee effusions. Mild penile erythema was also noted.

Laboratory investigations showed:

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<tr>
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<th>Result</th>
<th>Reference Range</th>
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<tbody>
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<td>WBC</td>
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<td>(4-11)</td>
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<td>Neutrophils</td>
<td>14.1 ×10⁹/L</td>
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<td>ESR</td>
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<tr>
<td>Rheumatoid factor</td>
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<tr>
<td>Urinalysis</td>
<td>No cells, casts or bacteria seen</td>
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What is the most likely diagnosis?

(Please select 1 option)

- Arthritis due to *Neisseria gonorrhoeae* infection - Correct
- Lymphogranuloma venereum
- Reactive arthritis
- Reiter's syndrome
The history is relatively acute with arthritis and urethritis plus there is a neutrophilia.

The diagnostic possibilities include Reiter's or gonococcal arthritis.

However, in this scenario, the acuteness of the illness on return from a holiday with no evidence of a preceding illness such as diarrhoea, and involvement of the larger joints, that is, knees, with effusions - suggests gonorrhoea.

Reference:

British Association for Sexual Health and HIV. BASHH Clinical Effectiveness Group Guidelines.
A 70-year-old man presented to his GP with a two-day history of increasing confusion. He also complained of a headache.

He was febrile on examination; nuchal rigidity was noted. A lumbar puncture was performed and CSF microscopy revealed WBC 800 cells/mL (< 5) 90% neutrophils. A few Gram positive diplococci were also noted.

What is the cause of his meningitis?

(Please select 1 option)

- Cryptococcus neoformans
- Haemophilus influenzae
- Listeria monocytogenes
- Neisseria meningitidis
- Streptococcus pneumoniae

A question on Gram staining properties of organisms causing meningitis.

Pneumococcal meningitis is commoner in older patients.

*Neisseria meningitidis* is a Gram negative diplococcus whilst *Haemophilus influenzae* is a Gram negative bacillus.

*Listeria monocytogenes* is a cause of neonatal meningitis, and is a small Gram positive bacillus that is carried in the intestine and vagina and may be transmitted to the neonate during the birth process.
Cryptococcus neoformans is a fungus and yeast cells may be seen on microscopic examination of the cerebrospinal fluid (CSF).

Answer Statistics

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Times answered: 7990

Test Analysis

Correct Incorrect Partially Correct

Score: 54.55%
Total Answered: 44

Feedback
A 22-year-old female student attended the Emergency Department complaining of fever and rigours for two days. She had returned from a sabbatical in Africa six weeks previously.

She was febrile (39.9°C) and a mild petechial rash was also noted.

Laboratory investigations showed:

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<th>Result</th>
<th>Normal Range</th>
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<td>WBC</td>
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<tr>
<td>Platelets</td>
<td>115 ×10⁹/L</td>
<td>(150-400)</td>
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<tr>
<td>Prothrombin time</td>
<td>Normal</td>
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What is the most likely diagnosis?

(Please select 1 option)

- Acute HIV infection (seroconversion illness)  □ Correct
- Cytomegalovirus (CMV) infection
- Dengue fever
- *Plasmodium falciparum* malaria
- Typhoid fever
A difficult question that partly hinges on the incubation times of these illnesses.

The incubation time is too long for dengue, typhoid and falciparum malaria.

The presentation is not typical of CMV.

Acute human immunodeficiency virus (HIV) presents two weeks to three months after exposure to the virus; the illness typically consists of:

- fever
- arthritis
- rash, and
- lymphadenopathy.

The presentation given here is not characteristic of acute HIV, but is the most reasonable of the options listed.

Answer Statistics

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Times answered: 8077

Test Analysis

Correct Incorrect Partially Correct
A 35-year-old man presented with cellulitis of his right leg.

On examination, he was mildly confused and febrile (40.1°C) with a pulse of 120/minute and BP 80/55 mmHg.

He was treated with intravenous benzylpenicillin and flucloxacillin. Group A *Streptococcus* was isolated from two sets of blood cultures. There was no significant clinical improvement after 24 hours.

What antibiotic should be added?

(Please select 1 option)

- Ciprofloxacin
- Clindamycin
- Gentamicin
- Rifampicin
- Vancomycin

The patient has a severe cellulitis with features of streptococcal toxic shock syndrome (TSS). *Streptococcal* TSS is mediated via streptococcal exotoxins.

Although Clindamycin is a bacteriostatic antibiotic, it acts by switching off protein synthesis within bacteria; this, in turn, will lead to decreased exotoxin expression, thereby removing the mediators of TSS.
Work Smart

Question 47 of 164

A 42-year-old man with advanced HIV disease presented with a tonic-clonic seizure. He had been diagnosed with HIV 10 years previously but had elected not to take antiretroviral therapy.

A CT scan of his brain showed a 2 cm ring-enhancing lesion in the right parietal lobe.

What is the probable causative agent?

(Please select 1 option)

- Cryptococcus neoformans
- Mycobacterium avium intracellulare
- Mycobacterium tuberculosis
- Pneumocystis jirovecii
- Toxoplasma gondii  

Correct

This is a typical presentation with AIDS-related cerebral toxoplasmosis.

The differential diagnosis of ring-enhancing lesions on CT in a patient with AIDS include:

- cerebral toxoplasmosis
- abscesses
- metastases
- atypical CNS lymphoma.

Cryptococcus typically cause meningitis.
CNS infections with the remaining organisms are rare in AIDS.

Further Reading:
Centers for Disease Control. Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents.

Answer Statistics

Score: 55.32%
Total Answered: 47
Work Smart

Question 22 of 50

A 56-year-old man from Thailand presented with abdominal pain and a mass in the right upper quadrant. He reported that he had been diagnosed with viral hepatitis several years previously.

Investigations showed:

| Serum alpha-fetoprotein | 13,500 IU/L | (< 10) |

Which of the following is the most likely underlying viral infection?

(Please select 1 option)

- [x] Hepatitis B virus  □ This is the correct answer
- [ ] Hepatitis C virus  □ Incorrect answer selected
- [ ] Hepatitis D virus
- [ ] Hepatitis E virus

The patient has chronic viral hepatitis and presents with an AFP elevated to such a degree that it is essentially diagnostic for hepatoma. The underlying cause is either HBV or HCV.

Since his country of origin is the only other detail given here this gives a clue to the cause of his hepatitis. There is a higher prevalence of HBV in the Far East, consequently, the most likely viral agent is HBV.
Work Smart

Question 23 of 50

A 26-year-old man with a history of alcohol and drug abuse was admitted with a 14-day history of fever, cough and fatigue.

He was emaciated. His temperature was 39.4°C. Cervical and axillary lymphadenopathy were present. Chest x ray revealed bilateral areas of pulmonary shadowing.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Alcoholic cardiomyopathy
- Pneumococcal pneumonia
- Pneumocystis pneumonia [Correct]
- Pulmonary tuberculosis
- Tricuspid endocarditis

This is a tricky question. It is leading you to consider a diagnosis of HIV in this gentleman, and subsequent opportunistic infections. His clinical presentation fits best with a diagnosis of Pneumocystis jirovecii.

Pneumocystis jiroveci is a eukaryotic microorganism. In immunosuppressed patients, it can cause pneumonia, which is most recognised in patients with AIDS but can also be seen in those with organ transplants or when undergoing chemotherapy. A CD4 count of less than 200 is associated with significant risk. In Europe, the USA and Australia P. jiroveci pneumonia in HIV-positive patients is
seen largely in those unaware of their HIV status. Unfortunately, it is a major cause of death in Africa, especially in children. Previously it was thought that disease was caused by reactivation of latent infection acquired in childhood, but de novo infection is increasingly recognised.

Pneumonia caused by *P. jiroveci* is potentially severe and fatal in immunosuppressed patients. Clinically it presents with several weeks' history of dry cough, fever and dyspnoea. Examination findings are often subtle but include tachypnoea, tachycardia, cyanosis and fine respiratory crackles. Typically, patients desaturate markedly on exertion. There may be reduced transfer factor, vital capacity and total lung capacity on spirometry. Bronchoalveolar lavage or induced sputum can be used to demonstrate the organism (open lung biopsy is the gold standard, but rarely performed in clinical practice). Giemsa, Papanicolaou and Grocott's stains are used.

There are a variety of different chest radiograph findings. Typically it causes bilateral symmetrical perihilar reticular or granular interstitial shadowing. Less often there can be asymmetric shadowing or progression to a reticular-alveolar pattern.

Occasionally lobar consolidation, nodular lesions, prominent pulmonary arteries, pneumothorax, pneumomediastinum, cysts or pneumatoceles can be seen. In patients who have been on prophylactic inhaled pentamidine, the infiltrates may predominantly affect the upper lobes. A normal chest x ray does not exclude the diagnosis. Pleural effusions and lymphadenopathy are not typical, but be aware of the possibility of multiple disease processes in an immunosuppressed patient.

If allowed to progress, *P. jiroveci* can disseminate via the lymphatic and haematogenous routes to affect the thyroid, liver, bone marrow, lymph nodes and spleen.

If PCP is suspected, treatment with full dose co-trimoxazole should be started as soon as possible. It should be given for 21 days in HIV-positive cases, but shorter doses can be used in other causes of immunosuppression. In patients who are intolerant or co-trimoxazole, intravenous pentamidine can be used. Some studies have shown that corticosteroids can reduce the risk of respiratory failure, and they are therefore used in some cases.

Prophylaxis should be used in immunosuppressed patients who are at risk of developing PCP: all those with a CD4 count of <200, patients started on high dose steroids, and those on chemotherapeutic regimens associated with significant immunosuppression. Co-trimoxazole is also the first line prophylactic agent.

Tuberculosis is another possible diagnosis, but would likely be miliary given the lymphadenopathy and respiratory symptoms. This usually presents with a more insidious onset, and the radiographic findings generally take a few weeks to develop. The incidence is dependent on the patient's exposure to TB, and it is, therefore, more common in patients who originate from areas of high prevalence.

Tricuspid endocarditis is definitely a possibility in an intravenous drug user presenting with these symptoms. Bilateral areas of pulmonary shadowing are possible due to septic emboli, but you may expect the question to report a murmur heart on auscultation.

Pneumococcal pneumonia typically has a shorter history than this, and bilateral disease is unusual.
Alcoholic cardiomyopathy presents with signs and symptoms of congestive cardiac failure, not those described here.

References:

A 28-year-old man who had been diagnosed two weeks previously with tuberculosis of the mediastinal lymph nodes and who had been started on chemotherapy with rifampicin, isoniazid and pyrazinamide was admitted because of the increasing dyspnoea and stridor.

Chest x-ray showed compression of both main bronchi by carinal lymph node enlargement.

What is the next step in management?

(Please select 1 option)

- Mediastinoscopy and biopsy
- Refer for tracheal stent insertion/tracheostomy
- Refer for urgent CT scan of the mediastinum
- **Start corticosteroids**  
  □ Correct
- The addition of ethambutol

The treatment of TB mediastinal lymphadenitis is the same as pulmonary TB.

The phenomenon of a 'paradoxical reaction' during treatment for TB has been recognised for many years. This can result in new lesions, or worsening of existing lesions. It is unpredictable in its timing and can occur anything from a few days to many months after the start of treatment.

Duration and severity are highly variable, and it can be difficult to differentiate from treatment failure, drug resistance or a superadded infection. Most cases are recognised in the setting of lymph node or cerebral disease. Enlargement is seen in 30% of cases. Occurrences are usually self-limiting.
Corticosteroids are effective in reducing lymph node enlargement and inflammation and hence will help the stridor and breathlessness.

As the compression is at the carina, tracheal stent or tracheostomy will not relieve the obstruction.

The diagnosis is already known, therefore mediastinoscopy and biopsy will not give any extra information. The same applies to a CT.

Whilst standard TB treatment is usually with ethambutol, rifampicin, isoniazid and pyrazinamide initially for two months, when the organism is known to be fully sensitive ethambutol need not necessarily be used. It is unlikely the omission of this drug has caused treatment failure and therefore adding it at this time is unlikely to relieve the symptoms.

Further Reading:

A 28-year-old man had been treated for pulmonary tuberculosis with rifampicin, isoniazid, pyrazinamide and ethambutol for four weeks.

Pre-treatment liver function tests (LFTs) were normal but his most recent investigations revealed:

<table>
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<tr>
<th>Test</th>
<th>Result (µmol/l)</th>
<th>Normal Range</th>
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</thead>
<tbody>
<tr>
<td>Serum total bilirubin</td>
<td>98</td>
<td>(0-18)</td>
</tr>
<tr>
<td>Serum alanine aminotransferase</td>
<td>620</td>
<td>(5-45)</td>
</tr>
<tr>
<td>Serum aspartate aminotransferase</td>
<td>450</td>
<td>(5-45)</td>
</tr>
<tr>
<td>Serum alkaline phosphatase</td>
<td>720</td>
<td>(40-110)</td>
</tr>
</tbody>
</table>

Which one of the following is the most appropriate next step?

(Please select 1 option)

- Stop all treatment [Correct]
- Stop ethambutol
- Stop isoniazid
- Stop pyrazinamide
- Stop rifampicin

All tuberculosis patients should have pre-treatment LFTs, should be supervised by a chest physician and should be informed of possible side-effects of treatment.
If there is no pre-existing liver disease, LFTs are only repeated (and treatment stopped) if fever, malaise, vomiting, jaundice or unexplained deterioration occurs during treatment.

Regular LFTs should be performed in patients with previously known chronic liver disease. If AST/ALT levels rise by five times normal/ bilirubin level rises, then rifampicin/isoniazid/pyrazinamide should be stopped.

If the patient is not unwell and/or has non-infectious TB, no treatment until LFT returns to normal.

If clinically unwell or sputum smear is positive within two weeks of starting treatment, consider streptomycin and ethambutol until LFT returns to normal.

Once LFT is back to normal, challenge dosages can be reintroduced sequentially in order of isoniazid, rifampicin and pyrazinamide with daily monitoring of patient's condition and LFT.

If there is a further reaction the offending drug should be excluded and a suitable alternative regimen used.
Transplacental transmission of all of the following organisms is a recognised cause of fetal malformations and disease except which of the following?

(Please select 1 option)

- Cytomegalovirus
- Mumps
- Rubella
- Toxoplasma gondii
- Varicella zoster virus

Cytomegalovirus in pregnancy can cause fetal abnormalities or abortion.

Varicella is rare in pregnancy but can be severe and cause the intrauterine death of the fetus.

Congenital toxoplasmosis usually results from an acute maternal infection during pregnancy.

Measles and mumps cause only mild maternal infection and do not pose a serious problem to the fetus.
A 15-year-old girl presents with fever, malaise and sore throat.

Examination reveals a temperature of 38.3°C with cervical lymphadenopathy.

Her results show:

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<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Normal Range</th>
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<tbody>
<tr>
<td>Haemoglobin</td>
<td>128 g/L</td>
<td>(115-165)</td>
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<tr>
<td>White cell count</td>
<td>9.8 ×10⁹/L</td>
<td>(4-11)</td>
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<tr>
<td>Neutrophils</td>
<td>3.7 ×10⁹/L</td>
<td>(1.5-7)</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>4.5 ×10⁹/L</td>
<td>(1.5-4)</td>
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Blood film reveals atypical mononuclear cells.

What is the most likely diagnosis?

(Please select 1 option)

- Acute lymphoblastic leukaemia
- Brucellosis
- Epstein-Barr viral (EBV) infection  □ Correct
- Hodgkin's disease
- Sarcoidosis
The diagnosis is EBV infection, infectious mononucleosis, which may be confirmed by the presence of immunoglobulin (Ig)M to EBV.

Answer Statistics

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Times answered: 7684

Test Analysis

Correct Incorrect Partially
Correct

Score: 55.1%
Total Answered: 49

Feedback
A 17-year-old male presented with a widespread maculopapular rash. He had been prescribed amoxicillin for exudative tonsillitis.

What is the most likely diagnosis?

(Please select 1 option)

- [ ] Acute HIV infection
- [ ] Cytomegalovirus infection
- [x] Infectious mononucleosis  □ Correct
- [ ] Parvovirus infection
- [ ] Streptococcal infection

This patient has the typical features of glandular fever and this is confirmed by the typical rash following the introduction of amoxicillin.

This rash is considered almost pathognomonic of glandular fever and will subside following the withdrawal of amoxicillin.

There are no other features in this patient's history to suggest an alternative diagnosis.
A 28-year-old shop worker is referred with a three-month history of recurrent episodes of disorientation and confusion.

Her boyfriend has found her wandering around the house on several occasions, apparently with no idea of where she is or how she got there. Her mood has been very low, with frequent emotional outbursts, and she has considered leaving her job because of problems with working the computer and managing customers' queries. Her boyfriend feels her condition is significantly worsening.

Physical examination is normal, apart from recurrent, asymmetrical, jerks in all four limbs.

Which of the following investigations is likely to be most useful in reaching a diagnosis?

(Please select 1 option)

- Chest x ray
- CT head
- EEG
- Liver function tests
- Visual evoked potentials

This kind of rapid cognitive decline in a young person with myoclonus is strongly suggestive of Creutzfeldt-Jakob disease (CJD).

A definitive diagnosis of any form of CJD requires pathological examination of brain tissue, which is usually only done post-mortem. During life, investigations are undertaken for two reasons: to exclude
other possible diagnoses, and to support the diagnosis of CJD. Supportive investigations are EEG, CSF examination and MRI.

The EEG in sporadic CJD may show significant abnormalities involving deep brain areas such as the thalami. The normal rhythms are gradually lost. Initially, the changes are diffuse, and non-specific, developing into generalised bi- or triphasic periodic sharp wave complexes with a frequency of 1-2 per second. High voltage sharp waves may be synchronous with myoclonic jerks. In an appropriate clinical context, this EEG pattern is strongly suggestive of a diagnosis of CJD.

Neither CSF examination nor MRI is options here, but both can also give supportive information. The CSF typically contains no inflammatory cells, but the total protein content may be raised. Analysis for brain-specific proteins, particularly 14-3-3, is supportive in the right clinical context.

In a proportion of cases, abnormalities of the signal in the anterior basal ganglia (caudate/putamen, and sometimes the cortex) can be seen on MRI, which can also support the diagnosis.

Chest x ray and liver function tests may help to exclude other diagnoses, but do not give supportive information for CJD.

Visual evoked potentials may be altered in CJD, but no specific pattern has yet been identified to support the diagnosis.

CT head generally demonstrates brain atrophy in CJD, but this is not a specific finding and is, therefore, less useful than an EEG.
Question 26 of 50

In the consideration of disseminated intravascular coagulation (DIC), which of the following statements is most correct?

(Please select 1 option)

- In DIC associated with sepsis secondary to retained products of conception, treatment of antibiotics will alleviate the process

- Organ failure is a common finding in DIC  □ Correct

- The intrinsic pathway is not involved in the pathophysiology of DIC

- The presence of DIC does not increase mortality from the underlying disease

- There are no randomised control trials to guide treatment in DIC

DIC is caused by the enhanced and abnormally sustained generation of thrombin.

Organ failure is a common finding, being as common as bleeding in DIC, and is likely to be due to fibrin deposition within the organ.

The presence of DIC significantly increases mortality rates in affected patients, and treatment of the underlying cause of the DIC, for example, sepsis, does not always lead to resolution of the condition.

Secondary bursts of thrombin formation seen in DIC are instigated by the intrinsic pathway.

For a well-informed review see the article below.

Further reading:
Toh CH, Dennis M. Disseminated intravascular coagulation: old disease, new hope. BMJ 2003;327:974-7

Answer Statistics

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Times answered: 8805

Test Analysis

Correct Incorrect Partially
Correct

Score: 53.85%
Total Answered: 26
A 15-year-old boy is referred by his GP with a two-week history of general malaise, fatigue and pharyngitis.

On examination, multiple small lymph nodes were palpable in the neck, axillae and groins.

Investigations revealed:

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<tr>
<th>Test</th>
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<th>Normal Range</th>
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<tbody>
<tr>
<td>Haemoglobin</td>
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<tr>
<td>WBC</td>
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<td>(4-11)</td>
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<tr>
<td>Platelets</td>
<td>160 ×10^9/L</td>
<td>(150-400)</td>
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<tr>
<td>Blood film</td>
<td>Lymphocytosis noted</td>
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</table>

What is the most likely diagnosis?

(Please select 1 option)

- Acute lymphoblastic leukaemia (ALL)
- Cytomegalovirus infection (CMV)
- Epstein-Barr virus infection (EBV) - Correct
- Hodgkin's disease (HD)
- Toxoplasmosis
Acute EBV typically presents with a history of one to two weeks of fatigue and malaise, fever, pharyngitis, and symmetrical, bilateral lymphadenopathy. Heterophil antibody tests are usually positive.

Mild transient thrombocytopaenia is not uncommon in EBV infectious mononucleosis.

CMV mononucleosis has a lower incidence of pharyngitis and cervical adenopathy.

Primary toxoplasmosis is acquired via ingestion of undercooked meat containing toxoplasma cysts or ingestion of fresh food contaminated by toxoplasma excreted in cats' faeces.

The infection is asymptomatic in 80-90% of immunocompetent patients.

Highly characteristic of toxoplasmosis is asymmetrical lymphadenopathy limited to an isolated lymph node group.

Patients with toxoplasmosis have little or no fever, fatigue, or pharyngitis.

CMV infectious mononucleosis may be indistinguishable in clinical presentation from EBV but is usually not accompanied by posterior cervical adenopathy; non-exudative pharyngitis is minimal or absent.

The diagnosis of ALL and HD is made by a combination of blood film examination, bone marrow aspiration and biopsy and lymph node biopsy.
Work Smart

Question 53 of 164

A 19-year-old man presented with purulent urethral discharge.

Microscopy of an urethral swab showed neutrophils but no organisms.

Which of the following antibiotics should be started?

(Please select 1 option)

- Ciprofloxacin
- Co-amoxiclav
- Doxycycline  □ Correct
- Metronidazole
- Penicillin

The diagnosis is non-gonococcal urethritis (NGU). A presumptive diagnosis of gonococcal urethritis is made if Gram-negative diplococci are seen within the neutrophils.

Doxycycline is the drug of choice for NGU. Alternative therapies include erythromycin, azithromycin, ofloxacin and ciprofloxacin.

*Chlamydia trachomatis* is the commonest cause of NGU accounting for 30-50% of cases.

All sexual partners at risk should be assessed and offered epidemiological treatment.
Work Smart

Question 54 of 164

One of the surgical wards in your hospital notes an outbreak of Methicillin-resistant \textit{Staphylococcus} aureus (MRSA) infections.

What is the best mechanism for reducing further transmission of this infection on the ward?

(Please select 1 option)

- Cleaning the floors and walls of the ward with chlorhexidine
- Close the ward for one month
- Encourage regular hand washing by ward staff \( \checkmark \) \textit{This is the correct answer}
- Screen ward staff using nasal swabs and exclude those with positive cultures for MRSA
- Treatment of culture-positive patients with vancomycin \( \checkmark \) \textit{Incorrect answer selected}

Cross-infection via hands of medical and nursing staff is a very important vehicle of transmission of MRSA. Hand washing before and after contact with patients is the single most effective measure to control hospital spread of this organism.

Screening of ward staff is appropriate only in certain situations and should not be carried out unless recommended by the hospital infection control team.

Vancomycin should never be used for MRSA decolonization.

The hospital infection control policy should outline which patients should be screened and when decolonization should be attempted.
Question 55 of 164

A 38-year-old woman is referred to the Emergency Department with bilateral weakness in her legs. She also complains of general malaise.

Three weeks previously she had returned from a four-week tour of Eastern Europe.

On examination, she appeared unwell and was pyrexial (38.9°C). She has large palpable cervical lymph nodes bilaterally. Her pharynx was inflamed with areas of exudate on the pharyngeal wall. Neurological examination revealed global weakness of both legs and absent reflexes.

What is the most likely diagnosis?

(Please select 1 option)

- Cytomegalovirus infection
- Diphtheria ✗ Correct
- Epstein-Barr virus infection
- Hodgkin’s disease
- Streptococcal tonsillitis

The breakdown of healthcare services in the former USSR was associated with a major resurgence of diphtheria.

Pharyngeal diphtheria presents with:

- fever
- sore throat
- cervical lymphadenopathy, and
- an adherent, grayish pharyngeal membrane.

The diphtheria toxin causes cardio- and neurotoxicity.

Treatment consists of antibiotic therapy and diphtheria antitoxin.

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### Answer Statistics

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Times answered: 8387

### Test Analysis

Correct Incorrect Partially Correct

Score: 56.36%
Total Answered: 55
### Work Smart

#### Question 56 of 164

Which one of the following measures would be most effective in reducing transmission of *E. coli* O157:H7 during an outbreak of diarrhoea caused by this organism?

(Please select 1 option)

<table>
<thead>
<tr>
<th>Option</th>
<th>Correct/Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking only boiled water</td>
<td></td>
</tr>
<tr>
<td>Ensuring that meat products are thoroughly cooked</td>
<td>This is the correct answer</td>
</tr>
<tr>
<td>Giving antibiotics to individuals who are positive for <em>E. coli</em> on stool culture</td>
<td></td>
</tr>
<tr>
<td>Hand washing before preparing food</td>
<td>Incorrect answer selected</td>
</tr>
<tr>
<td>Isolation of individuals with diarrhoea</td>
<td></td>
</tr>
</tbody>
</table>

Cattle are a major reservoir of *Escherichia coli* O157:H7 and contaminated meat is the most commonly implicated source of outbreaks.

Raw meat should be separated from cooked and ready-to-eat food. Hands should be washed after handling raw meat.

Antibiotics are not routinely indicated and patients should be educated on personal hygiene.
Work Smart

Question 57 of 164

Which of the following is a cause of isolated B-cell immune deficiency?

(Please select 1 option)

- Infection with measles
- Multiple myeloma
- Treatment with azathioprine
- Treatment with corticosteroids
- Treatment with cyclophosphamide

Excessive production of myeloma paraprotein is associated with progressive reduction in normal immunoglobulin levels and impairment of immune function.

Azathioprine, cyclophosphamide, corticosteroids, and measles infection all cause reversible impairment of cell-mediated immunity.
Work Smart

Question 58 of 164

One of the phlebotomists at your surgery sustains a needlestick injury while taking blood from a patient.

What is the single, most appropriate, immediate management?

(Please select 1 option)

- Administer prophylactic hepatitis B immunoglobulin regardless of vaccine status
- Exclude the nurse from performing exposure-prone procedures for three months until a negative HIV antibody test has been obtained
- Immediately take the nurse's blood to test for antibodies to hepatitis B, hepatitis C and human immunodeficiency viruses
- Prompt administration of antiretroviral therapy
- Wash the wound with soap under running water  □ Correct

First line management of needlestick injuries includes immediate washing of the affected area under running water.

All incidents should be reported to the occupational health department and have a careful risk assessment.

HBIG is given only if the donor is known hepatitis B positive and the victim is non-immune.

Antiretroviral therapy is given, after counselling, if the donor is known HIV positive and the exposure is deemed high risk.
Reference:


Answer Statistics

Times answered: 8370

Test Analysis

Score: 55.17%
Total Answered: 58
Question 27 of 50

A 21-year-old man with non-Hodgkin's lymphoma and haemolytic anaemia is assessed for splenectomy.

When should Pneumovax vaccine be administered?

(Please select 1 option)

- At least one week before surgery
- At least two weeks before surgery  □ This is the correct answer
- One week after surgery
- One month after surgery
- Perioperatively  □ Incorrect answer selected

The vaccine should be given a minimum of two weeks before elective splenectomy in order to ensure an optimal antibody response.

In emergency splenectomy, the patient should be immunised seven days after surgery or before discharge from hospital.

Unvaccinated patients who have had a splenectomy sometime earlier should be vaccinated at the first opportunity.

Vaccination is delayed for at least six months after immunosuppressive chemotherapy or radiotherapy during which time prophylactic antibiotics should be given.
A 25-year-old man presented with severe headache, myalgia and a blanching red macular rash. He had returned from Indonesia three days previously.

On examination, his blood pressure was 75/50 mmHg. A diagnosis of dengue fever was made.

Which of the following would be given immediately?

(Please select 1 option)

- A single dose of ivermectin
- Intravenous hydrocortisone 200 mg
- Intravenous normal saline  ✔ Correct
- Metronidazole
- Tetracycline

Dengue is transmitted by *Aedes aegypti* mosquito in endemic areas.

There are four serotypes.

Re-infection with a different serotype aggravates the infection and is associated with serious complications such as dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS). Treatment is supportive with fluid replacement, blood transfusion and correction of clotting.

Corticosteroids have no role.

In the first few days, the rash is macular, blanching and transient. The second rash which looks like
measles and is morbilliform, maculopapular, sparing palms and soles.

Do not confuse dengue fever with dengue haemorrhagic fever.

Reference:

Medline Plus. Dengue Fever.
A 17-year-old male presented to the Emergency Department complaining of difficulty breathing. He had been brought to hospital by ambulance, having collapsed shortly after being stung on the hand by a bee.

On examination, his blood pressure was 80/40 mmHg, and facial swelling was noted.

Which one of the following investigations is most likely to confirm the nature of the reaction?

(Please select 1 option)

- Haemolytic complement (CH50) level
- Plasma tryptase activity
- Serum complement C3 level
- Serum total IgE level
- Serum venom-specific IgE level

Type I hypersensitivity, also known as immediate or anaphylactic hypersensitivity, usually takes 15-30 minutes from the time of exposure to the antigen. The reaction may cause a range of symptoms from minor inconvenience to death.

The reaction involves preferential production of IgE in response to certain antigens which in turn initiates a sequence of events leading to the release of various pharmacologically active substances that are responsible for the clinical features.

Diagnostic tests include skin tests, measurement of total IgE and specific IgE antibodies against the
suspected allergens. However, this question asks which of the following tests would provide confirmatory information and that would be tryptase.

Tryptase is a neutral protease stored in mast cell secretory granules that is secreted by human mast cells. Levels in normal blood are undetectable (< 1 ng/mL). Elevated serum levels demonstrate that mast cell activation with mediator release has occurred whether triggered by IgE-mediated anaphylaxis or non-IgE-mediated anaphylactoid reactions. The greater the severity of anaphylaxis, the more likely that serum tryptase levels will be elevated.

Answer Statistics

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Times answered: 8306

Test Analysis

Correct Incorrect Partially Correct

Score: 53.33%
A 25-year-old woman presented with a history of confusion and fever that had worsened gradually over the preceding four days.

On examination, she was drowsy and had mild neck stiffness. Neurological examination revealed an extensor left plantar response. A CT scan of her brain showed an area of low attenuation in the right temporo-parietal region.

What is the most likely diagnosis?

(Please select 1 option)

- Cerebral toxoplasmosis
- Herpes simplex encephalitis [Correct]
- Listerial meningoencephalitis
- Pneumococcal meningitis
- Pyogenic brain abscess

Herpes simplex encephalitis (HSE) often presents subacutely over several days with declining cerebral function. The temporal or temporo-parietal regions are affected earlier and neuro-imaging usually demonstrates this. However, temporal lobe involvement is not pathognomonic of HSE.

Cerebral toxoplasmosis is the result of reactivation of toxoplasmosis in severely immunocompromised individuals.

Listeriosis is associated with the consumption of soft cheese.
Streptococcus pneumoniae causes acute pyogenic meningitis and is often associated with suppurative otitis media or sinusitis.

Brain abscesses are usually readily demonstrable by cranial CT scans.
A 15-year-old boy was treated with permethrin cream for scabies infestation, with the treatment being repeated after seven days as recommended. On follow-up three weeks later, he was found to have continuing infestation. What is the most likely reason for this?

(Please select 1 option)

- Facial skin was not treated
- Non-disposal of underwear
- Other household members were not treated
- The organism is resistant to permethrin
- The treatment was not repeated for a third time as recommended

Scabies is an intensely pruritic and highly contagious infestation of the skin acquired through close personal contact.

A delayed type IV hypersensitivity reaction to the mites, their eggs, or excreta occurs approximately 30 days after infestation and is responsible for the intense pruritus that is the hallmark of the disease.

Treatment is topical, and often with permethrin. Application should be repeated seven days after initial treatment to kill any mites hatched from eggs in that time, and if done properly, treatment failures are uncommon. Recurrence of the eruption usually means re-infection has occurred, and this is often from close household contacts. All household members and close personal contacts should,
therefore, be treated whether or not they are symptomatic and patients should be re-examined two weeks after treatment to evaluate effectiveness.

Answer Statistics

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Times answered: 8689

Test Analysis

Correct Incorrect Partially Correct

Score: 52.46%

Total Answered: 61
A 15-year-old girl presented with a 12-hour history of fever and global headache. On examination, she was febrile (37.5°C). She was fully conscious. Mild neck stiffness was noted but there were no other neurological signs.

Cerebrospinal fluid analysis showed:

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<tr>
<th>Parameter</th>
<th>Value</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell count</td>
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<td>(60% lymphocytes)</td>
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<tr>
<td>Protein</td>
<td>0.8 g/L</td>
<td>(0.15-0.45)</td>
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<td>4.3 mmol/L</td>
<td>(3.3-4.4)</td>
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<tr>
<td>Gram stain</td>
<td>No organisms seen</td>
<td></td>
</tr>
</tbody>
</table>

What is the most likely diagnosis?

(Please select 1 option)

- Bacterial meningitis
- Cryptococcal meningitis
- Lymphomatous meningitis
- Tuberculous meningitis
- Viral meningitis  □ Correct

Enteroviruses and mumps are the commonest causes of viral meningitis.
Cerebrospinal fluid changes with bacterial meningitis typically include:

- high protein
- low glucose, and
- neutrophil pleocytosis.

Cryptococcal meningitis is an infection of severely immunocompromised individuals, especially advanced human immunodeficiency virus (HIV) infection.

Tuberculous meningitis is an insidious illness, presenting over weeks and months.
A 55-year-old Caucasian man presented to hospital with fever, intermittent rigours, and worsening fatigue. He had returned from a business trip to West Africa six months previously.

What is the most likely diagnosis?

(Please select 1 option)

- Brucellosis
- Leishmaniasis
- *Plasmodium falciparum* malaria (Incorrect answer selected)
- *Plasmodium ovale* malaria (This is the correct answer)
- Typhoid fever

The Duffy blood group on the red blood cells acts as a receptor for *P. vivax*. West Africans lack the Duffy blood group and therefore *P. ovale* replaces *P. vivax* in this region.

Both *P. vivax* and *P. ovale* have a liver hypnozoite stage which can cause repeated relapses.

*P. falciparum* typically presents within the first three months of return.

Visceral leishmaniasis is not endemic in West Africa.

Brucellosis is a zoonosis transmitted through contaminated and untreated milk and by direct contact with infected animals. The incubation period of brucellosis is usually one to three weeks, but sometimes may be several months. It may have either a sudden or insidious onset and is accompanied by continued, intermittent, or irregular fever.
Typhoid fever presents within one to three weeks from return from an endemic area.
An 80-year-old man with a five-year history of diet-controlled type 2 diabetes mellitus presents with a one-month history of cough and weight loss. He was a non-smoker and had difficulty expectorating.

Investigation revealed a HbA1c of 53 mmol/mol (20-42) but his chest x ray showed a cavitating left apical shadow.

Which of the following investigations would be most useful in establishing the cause of this lesion?

(Please select 1 option)

- Bronchoscopy  □ This is the correct answer
- CT scan of the chest
- Gastric aspirate for acid-fast bacilli  □ Incorrect answer selected
- Percutaneous lung biopsy
- Sputum for acid-fast bacilli

The differential diagnosis of cavitating lung lesions is shown below.

The most likely diagnosis in this non-smoking man is post primary tuberculosis as a result of reactivation of quiescent disease. He has several risk factors including increasing age and diabetes.

The patient is unable to produce sputum, therefore, undertaking a bronchoscopy with bronchial washings for microscopy staining and culture is the investigation of choice. Gastric lavage for AFB is unpleasant for the patient has a lower yield than bronchoscopy and is therefore rarely undertaken now.
Causes of cavitating masses on CXR:

- lung abscess
- tuberculosis
- fungal infection (e.g., histoplasmosis, coccidioidomycosis)
- malignancy
- Wegener's granulomatosis commonly
- rheumatoid arthritis (multiple), and
- infarction.

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Times answered: 9069
A 40-year-old man presents with a long history of productive cough and breathlessness. He had complained of halitosis and exacerbations of productive sputum, chest pain and haemoptysis.

Examination revealed bilateral inspiratory crackles.

Which of the following treatments is likely to decrease the frequency of his exacerbations?

(Please select 1 option)

- Cyclical antibiotic therapy
- Inhaled corticosteroids
- Nebulised bronchodilators
- Postural drainage
- Surgical resection

This man has bronchiectasis as evidenced by his regular production of sputum associated with breathlessness, his repeated lung infections and the signs of bilateral inspiratory crackles.

Retained mucus is the most important reason why bronchiectatic patients become infected. Postural drainage is, therefore, the cornerstone to treating bronchiectasis and should be undertaken at least once per day and more frequently during exacerbations.

There have been trials looking at regular antibiotic therapy versus symptomatic treatment in patients with cystic fibrosis colonised with *Pseudomonas* (for example, Elborn JS et al. Thorax 2000;55: 355-358) but there is currently no evidence that this approach is of benefit in bronchiectasis.
Similarly, inhaled corticosteroids should not be used routinely in bronchiectasis until further evidence of their effect on lung function and exacerbation frequency is available.

Surgical resection as a curative procedure can be performed for localised disease when underlying causes such as primary ciliary dyskinesia have been excluded.

In this patient, the bilateral crackles suggest widespread disease.
A 75-year-old woman presents with an acute infective exacerbation of her longstanding chronic obstructive airways disease.

Blood gas analysis whilst she was receiving oxygen shows:

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<td>(11.3-12.6)</td>
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<tr>
<td>$PCO_2$</td>
<td>10.5 kPa</td>
<td>(4.7-6.0)</td>
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What is the most appropriate immediate management for this patient?

(Please select 1 option)

- CPAP
- Doxapram infusion
- Invasive ventilation
- Nebulised salbutamol with ipratropium
- Reduce inspired oxygen concentration  

This patient's blood gases show she is receiving too high a concentration of oxygen which is likely to have precipitated her hypercapnic acidosis.
Patients with chronic obstructive airways disease (COPD) should not, in general, receive more than 24-28% oxygen without arterial blood gas monitoring. Reduction of FiO₂ may be sufficient to improve this lady's acidosis.

Once this is done she should be treated with nebulised bronchodilators driven on air and if she fails to improve despite controlled oxygen and bronchodilators non-invasive ventilation (NIV) is indicated.
A 30-year-old man presents with acute, profuse, watery diarrhoea with some blood after returning from a holiday in Tanzania. He had been taking oral rehydration salts.

Which one of the following is the most appropriate treatment?

(Please select 1 option)

- Ciprofloxacin [Correct]
- Loperamide
- Metronidazole
- Prednisolone
- Vancomycin

The most likely cause of such traveller's diarrhoea is *Escherichia coli* and hence ciprofloxacin is recommended for first-line antibiotic therapy (when needed) before stool culture results are available.

Metronidazole would be suitable for *Giardia* infection but its course is usually more insidious.
A 42-year-old restaurateur who has been human immunodeficiency virus (HIV) positive for eight years presents with progressive shortness of breath on exercise.

The chest x ray shows normal lung fields with prominent pulmonary arteries. Pulse oximetry demonstrates that he desaturates on exercise.

Which is the most likely diagnosis?

(Please select 1 option)

- Anaemia
- Intracardiac shunt across an atrial septal defect
- Pneumocystis jiroveci pneumonia (PCP)  □ Correct
- Primary pulmonary hypertension
- Pulmonary embolic disease

The history of dyspnoea and desaturation on exercise in an HIV-positive patient would suggest PCP. 

*Pneumocystis jiroveci* is a eukaryotic microorganism. In immunosuppressed patients, it can cause pneumonia which is most recognised in patients with AIDS but can also be seen in those with organ transplants or when undergoing chemotherapy. A CD4 count of less than 200 is associated with significant risk.

In Europe, the USA and Australia *P. jiroveci* pneumonia in HIV-positive patients is seen largely in those unaware of their HIV status. Unfortunately, it is a major cause of death in Africa, especially in...
children. Previously it was thought that disease was caused by reactivation of latent infection acquired in childhood, but de novo infection is increasingly recognised.

Pneumonia caused by *P. jiroveci* is potentially severe and fatal in immunosuppressed patients. Clinically it presents with several weeks’ history of dry cough, fever and dyspnoea. Examination findings are often subtle but include tachypnoea, tachycardia, cyanosis and fine respiratory crackles. Typically, patients desaturate markedly on exertion.

There may be reduced transfer factor, vital capacity and total lung capacity on spirometry. Bronchoalveolar lavage or induced sputum can be used to demonstrate the organism (open lung biopsy is gold standard, but rarely performed in clinical practice). Giemsa, Papanicolaou and Grocott's stains are used.

There are a variety of different chest radiograph findings. Typically it causes bilateral symmetrical perihilar reticular or granular interstitial shadowing. Less often there can be asymmetric shadowing or progression to a reticular-alveolar pattern. Occasionally lobar consolidation, nodular lesions, prominent pulmonary arteries, pneumothorax, pneumomediastinum, cysts or pneumatoceles can be seen.

In patients who have been on prophylactic inhaled pentamidine, the infiltrates may predominantly affect the upper lobes. A normal chest x ray does not exclude the diagnosis. Pleural effusions and lymphadenopathy are not typical, but be aware of the possibility of multiple disease processes in an immunosuppressed patient.

If allowed to progress, *P. jiroveci* can disseminate via the lymphatic and haematogenous routes to affect the thyroid, liver, bone marrow, lymph nodes and spleen.

If PCP is suspected, treatment with full dose co-trimoxazole should be started as soon as possible. It should be given for 21 days in HIV-positive cases, but shorter doses can be used in other causes of immunosuppression. In patients who are intolerant of co-trimoxazole, intravenous pentamidine can be used. Some studies have shown that corticosteroids can reduce the risk of respiratory failure, and they are therefore used in some cases.

Prophylaxis should be used in immunosuppressed patients who are at risk of developing PCP: all those with a CD4 count of <200, patients started on high dose steroids and those on chemotherapeutic regimens associated with significant immunosuppression. Co-trimoxazole is also a first line prophylactic agent.

Pulmonary hypertension does develop with increased frequency in patients with HIV, but this is secondary rather than primary. Primary pulmonary hypertension is rare, and more commonly affects females.

Anaemia is a possibility, but the chest x ray findings and history of HIV make PCP more likely.

Atrial septal defects with intracardiac shunting can eventually lead to hypoxia (Eisenmenger syndrome), but this is less likely than PCP in patients known to be HIV-positive.
This history may also be consistent with multiple small pulmonary emboli, but again this is less likely than PCP in an HIV-positive patient.

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Times answered: 8997

Score: 54.29%

Total Answered: 35
Work Smart

Question 63 of 164

A 17-year-old boy is diagnosed with scabies.

Which of the following statements regarding scabies is correct?

(Please select 1 option)

- Is best treated by salicylate emulsion
- It can be spread by a droplet infection
- It causes itchiness in the skin even where there is no obvious lesion to be seen [Correct]
- It is caused by *Staphylococcus aureus*
- Typically affects the face

Scabies is an infestation of the skin with the microscopic mite *Sarcoptes scabiei*. Infestation is common, found worldwide, and affects people of all races and social classes.

Scabies spreads rapidly under crowded conditions where there is frequent skin-to-skin contact between people, such as in hospitals, institutions, child-care facilities, and nursing homes.

Scabies can spread by direct, prolonged, skin-to-skin contact, with a person already infested with scabies. Contact must be prolonged (a quick handshake or hug will usually not spread infestation).

Infestation is easily spread to sexual partners and household members. Infestation may also occur by sharing clothing, towels, and bedding.

Scabies is characterised by papular-like irritations, burrows or rash of the skin, especially the webbing between the fingers; the skin folds on the wrist, elbow, or knee; the penis, the breast, or shoulder
blades.

A number of treatments are available for the treatment of scabies, including permethrin ointment, benzyl benzoate, and oral ivermectin for resistant cases. Antihistamines and calamine lotion may be used to alleviate itching.
A 47-year-old woman presents with high fever, rigours, and myalgia. Nasal aspirate is positive for influenza virions.

Which of the following is true of her B cell response?

(Please select 1 option)

- Affinity maturation takes place in the blood stream
- Deficiency of either CD40 or CD40L still allows an IgG response
- Her B cells express immunoglobulin on their surface
- Memory cells are not formed as repeated infections with influenza often occur
- The antibody response to the virus does not require T cell help

B cells usually require T cell help for full activation.

B cells activated in the primary immune response initially produce IgM. With continuing T cell help, B cells then undergo heavy chain class switching and enter germinal centres in secondary lymphoid organs. The germinal centres are the sites of immunoglobulin affinity maturation and memory B cell formation.

Various factors including the nature of T cell help, antigen exposure site and cytokine profile, determine the isotype of heavy chain produced.

CD40 and CD40L are required for co-stimulation by T cells. Deficiency of either CD40 or CD40L impairs class switching.
Certain antigens, thymus thymus-independent antigen, can activate B cells in the absence of T cell help. T cell independent B cell responses are mainly to carbohydrate antigen, for example, pneumococcal polysaccharide. These antigens are not processed and presented in association with MHC molecules, and therefore cannot activate T helper cells.

Most TI antigens have highly repetitive epitopes (for example, LPS/endotoxin), which are able to cross link B cell surface immunoglobulin and activate these cells.

Some T cell independent antigens can cause proliferation of B cells regardless of their specificity: polyclonal B cell activation. B cell responses to T independent antigens consist mainly of IgM antibodies of low affinity without the production of memory cells.

The influenza virus will activate T and B cells, and result in memory cell production.

Genetic mutation in the virus is responsible for immune evasion and repeated infections.
A 40-year-old farmer presented to the Emergency Department with a 24-hour history of fever and increasing confusion.

On examination he was febrile 39.5°C. A generalised erythematous rash covering most of his body was observed. He also had a paronychial infection of his right index finger with lymphangitis extending caudally and with axillary lymphadenopathy.

His heart rate was measured at 120 beats per minute with a blood pressure of 80/60 mmHg.

What is the most likely diagnosis?

(Please select 1 option)

- Hantavirus infection
- Leptospirosis
- Orf
- Staphylococcal toxic shock syndrome
- Stevens-Johnson syndrome

The history is typical of staphylococcal toxic shock syndrome (TSS):

- shock
- fever
- confusion, and
- rash.
The primary source of infection, in this case, is the paronychia of his right index finger.

*Hantavirus* infections (viral zoonoses transmitted via rodents) typically have two distinct presentations, either:

- as a haemorrhagic fever with renal failure, or
- as an acute pulmonary syndrome.

The former manifestation is commonest in the Far East and Eastern Europe, while the latter is the predominant form in the southwestern United States and South America.

Leptospirosis does not typically cause a rash and is often associated with jaundice; leptospirosis would not explain the lesion on his finger.

Orf, a zoonotic infection caused by a pox virus, presents with painless ulcerated lesions on the hands of farmers but does not fully explain this clinical picture.

Stevens-Johnson syndrome typically starts with an erythema multiforme-type rash that spreads widely and involves the buccal mucosa and conjunctivae, often caused by antibiotic therapy; but does not fit the clinical picture presented here.
A 22-year-old woman is referred to hospital with a one-week history of fever, headache and fatigue. She had recently moved to the United Kingdom from Thailand to live with her new husband.

Based on her travel history which disease can be excluded from the following list of differentials?

(Please select 1 option)

- Cerebral toxoplasmosis
- HIV seroconversion illness
- Japanese B encephalitis
- Tuberculosis
- Yellow fever

Yellow fever is an RNA virus transmitted by female mosquitoes, which results in an acute haemorrhagic disease. It is found in tropical and subtropical regions of South America and Africa, but not in Asia.

Japanese B encephalitis has a high prevalence in south-east Asia.

All of the other diseases listed are widespread globally.

Further Reading:

A 42-year-old HIV-seropositive man presents to the Emergency Department with a two-week history of global headache. His partner says that he has become increasingly confused and disorientated. The patient’s latest CD4 count, taken three weeks ago, was 50 cells/mm$^3$. He had chosen not to take antiretroviral therapy but was taking co-trimoxazole as prophylaxis against *Pneumocystis jirovecii* pneumonia.

On examination, he had mild weakness of his left arm and leg in all muscle groups and a right homonymous hemianopia. Fundoscopy was normal with no evidence of papilloedema. A CT scan of his brain showed several areas of low attenuation in both cerebral hemispheres, but there was no enhancement with contrast and no mass effect.

What is the most likely diagnosis?

(Please select 1 option)

- Cerebral lymphoma
- Cerebral toxoplasmosis
- HIV encephalopathy
- Neurosyphilis
- Progressive multifocal leukoencephalopathy □ Correct

The most likely diagnosis is progressive multifocal leukoencephalopathy (PML), a demyelinating disease seen in advanced HIV/AIDS and caused by the JC virus.
Cerebral lymphoma and cerebral toxoplasmosis are often associated with mass effect on CT brain scanning. In CNS lymphoma there is usually a solitary lesion. Cerebral toxoplasmosis is frequently that show ring enhancement with IV contrast.

HIV encephalopathy may be associated with confusion but is not associated with this CT appearance. This is not a typical presentation of neurosyphilis in any of its forms.

Further Reading:

Work Smart

Question 68 of 164

A 16-year-old boy presented with fever, headache, and neck stiffness for 24 hours. He had an identical illness requiring admission to hospital one year previously.

Cerebrospinal fluid analysis shows white cells of 400/ml with a 90% neutrophilia and Gram stain revealed scanty Gram-negative diplococci.

Which component of the immune system is likely to be defective?

(Please select 1 option)

<table>
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<th>B lymphocytes</th>
<th>Complement pathway</th>
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This young man has a recurrent meningococcal meningitis, and deficiencies of complement C5-9 predispose to disseminated *Neisseria* infections (complement deficiencies). Deficiency of C3 also predisposes to infection by encapsulated organisms, such as *Neisseria* or *Pneumococcus*.

One must recognise that the diplococci seen on microscopy are those of *Neisseria meningitidis*. 
Question 69 of 164

A 15-year-old female is a close contact of a student who has developed meningitis C. The last contact she had with her friend was two days ago when her friend developed a headache.

She has not received any previous vaccination for meningitis.

What is the most appropriate action for this girl?

(Please select 1 option)

- No treatment is required and the girl can be reassured
- She should receive the meningococcal C vaccination only
- She should receive the meningococcal C vaccination plus ciprofloxacin
- She should receive meningococcal immunoglobulin only
- Treat with rifampicin only

This girl runs a reasonably high risk of developing meningitis and should receive meningitis C vaccination together with chemoprophylaxis.

UK Public Health guidance (referenced below) now recommends ciprofloxacin as first-line chemoprophylaxis in all age groups and in pregnancy. This has replaced rifampicin, as it can be given as a single dose, does not interact with oral contraceptives and is more readily available in community pharmacies. The risk of arthropathy in children (which is why it is not usually given to children) has been found to be very low, with only transient arthralgia which was considered to be coincidental in most cases.
Close contacts of those with confirmed serogroup C meningococcal disease who were only immunised in infancy or who have completed the immunisation course more than one year before should be offered an extra dose of the Meningitis C conjugate vaccine. The quadrivalent conjugate vaccine is reserved for contacts of cases of confirmed serogroup A, W135 or Y infection (or probable cases where these organisms are found on nasopharyngeal swab).

Reference & Further Reading:

Work Smart

Question 70 of 164

A patient is planning to travel through the southern states of America but is worried about West Nile virus.

Which of the following statements regarding West Nile virus is correct?

(Please select 1 option)

- Infection is non-fatal
- Is a member of the picornavirus family
- May be associated with poliomyelitis-like paralysis  ✔️ Correct
- Transplacental transmission does not occur
- Treatment with interferon is effective in West Nile virus encephalitis

West Nile virus is a mosquito-borne zoonotic arbovirus belonging to the genus *Flavivirus*. It is thought it is spread when a mosquito bites an infected bird and then bites a human. Few of those bitten develop symptoms and even fewer progress to severe disease.

West Nile virus can be spread via vertical transmission as well as blood transfusions and organ transplant.

If infected with the virus there are generally three different outcomes:

1. Asymptomatic (estimated 90%)
2. A mild febrile syndrome known as West Nile fever, or rarely
3. Neuro-invasive disease termed West Nile meningitis or encephalitis.
West Nile fever can present with several vague 'generally unwell' symptoms that tend to last three to six days such as:

- abdominal pain
- diarrhoea
- fever
- headache
- arthralgia
- nausea and vomiting
- rash
- sore throat, and
- lymphadenopathy.

The following symptoms are suggestive of West Nile encephalitis/meningitis and prompt medical attention is required:

Extrapyramidal signs include:

- confusion and seizures
- loss of consciousness or coma
- muscle weakness
- stiff neck, and
- weakness of one arm or leg (a poliomyelitis-like paralysis).

Diagnosis can be via blood or cerebral spinal fluid serology for West Nile antibodies. More rapid techniques using polymerase chain reaction may be used.

Due to the viral nature of the infection, the current best treatment is supportive. In general, it has an excellent prognosis. For those rare cases with severe infection, it may lead to brain damage and death. Approximately 10% of patients with brain inflammation do not survive.

In 2003 there were 276 deaths attributed to West Nile virus.

Interestingly, West Nile Virus is endemic in the avian population. The deaths of large numbers of birds in an area may thus herald an imminent epidemic of West Nile virus.
Work Smart

Question 71 of 164

Which of the following statements regarding Japanese encephalitis is most true?

(Please select 1 option)

- Is endemic in East Africa
- It is a DNA virus
- It is only recognised in travellers who have spent prolonged periods in endemic areas
- Previous exposure to a flavivirus predisposes to increased risk of death on infection with Japanese encephalitis
- Transplacental transmission occurs

Japanese encephalitis is an RNA virus which is endemic in India, East Asia, Malaysia and the Philippines.

Previous infection by a pathogen which is a member of the *Flavivirus* family seems to protect against serious disease or death when infection occurs with another member of the *Flavivirus* family. For instance, previous exposure to dengue lowers the risk of death when infected by Japanese encephalitis.

Infection with Japanese encephalitis has been reported in travellers who have spent only short periods in endemic areas, and transplacental transmission can occur.

An immunisation is available for travellers.
Dysentery is characterised by the passing of frequent (sometimes very frequent) stools, that may contain blood, mucus or pus.

*Shigella dysenteriae* is responsible for bacillary dysentery, a disease most often associated with crowded, unsanitary conditions. Other species of *Shigella* may produce milder forms of diarrhoeal disease.

Dysentery is an oral infection transmitted via faecal contamination of water or food. During the one to four day incubation period, penetration of bacteria into the mucosal epithelial cells of the intestine causes an intense irritation of the intestinal wall, producing cramps and a watery, bloody diarrhoea.

Amoebiasis is most commonly asymptomatic initially, with cysts being present in the faeces (although stool examination has low sensitivity). Symptoms can develop later in the disease course, with lower
abdominal pain and diarrhoea. Dysentry can then develop if left untreated.
A 38-year-old male with a diagnosis of HIV presents with lethargy, confusion, personality change, and a seizure.

CT shows multiple ring enhancing mass lesions in both cerebral hemispheres.

Which of the following treatments is indicated?

(Please select 1 option)

- Broad spectrum antibiotics
- Corticosteroids
- Ketoconazole
- Pyrimethamine and sulfonamide • Correct
- Rifampicin and pyrazinamide

Cerebral *Toxoplasma* infection gives rise to multiple ring enhancing lesions on CT and MRI scanning.

Multiple cerebral abscesses are commonly present, which may result in multifocal symptoms, including:

- visual field deficits
- focal seizures
- aphasia
- hemiparesis or hemisensory deficits
- cranial nerve palsies, and
- cerebellar dysfunction.

Non-focal symptoms such as a confusional state or personality disorder may manifest initially, but focal symptoms eventually appear as the disease progresses.

Answer Statistics

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Times answered: 8396

Test Analysis

- Correct
- Incorrect
- Partially Correct

Score: 50.68%

Total Answered: 73
A 72-year-old gentleman presents with increasing shortness of breath, fever and cough.

A chest x ray shows findings consistent with a right middle lobe pneumonia.

Which factor is associated with a worse prognosis?

(Please select 1 option)

- Blood pressure of 120/80 mmHg
- Respiratory rate of 18/min
- Temperature of 37.2
- Urea of 18 mmol/l  □ Correct
- White cell count of 15x10⁹

LBTS guidelines suggest:

- increasing age
- co-morbidity
- respiratory rate above 30/min
- BP less than 90 systolic
- hypoxaemia
- WCC <4 or >20 x10⁹/L (4-11 x10⁹)
- chest radiographic signs
- positive blood cultures
- confusion, and
• urea above 7 mmol/l

are indicators of a worse prognosis associated with community-acquired pneumonia.
A 51-year-old lady presented to hospital with a two-day history of malaise and headache.

On the day of admission, the headache had become more intense and was associated with pain in her neck.

Her husband reported that she had also been febrile and confused at times. She had previously been well and had no significant past medical history.

On examination, she was febrile 38.1°C, looked unwell and was photophobic. Kernig's and Brudzinski's signs were positive. The fundi were normal with no evidence of papilloedema.

Following a normal CT scan a lumbar puncture was performed and CSF analysis showed:

<table>
<thead>
<tr>
<th>White cells</th>
<th>200/mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red cells</td>
<td>2/mm³</td>
</tr>
<tr>
<td>CSF protein</td>
<td>0.9 g/L</td>
</tr>
<tr>
<td>CSF glucose</td>
<td>1.6 mmol/L</td>
</tr>
<tr>
<td>Plasma glucose</td>
<td>5.3 mmol/l</td>
</tr>
</tbody>
</table>

What is the most likely causative organism?

(Please select 1 option)

- [ ] Eschericia coli
- [ ] Listeria monocytogenes
- ☒ Mycobacterium tuberculosis  □ Incorrect answer selected
The most common causes of bacterial meningitis in persons over 50 years of age are:

- *Streptococcus pneumoniae*
- *Neisseria meningitidis*
- *Listeria monocytogenes*
- Gram negative bacilli.

Although this question tries to establish whether candidates are aware of the most common cause of meningitis in this group, some questions in the examination give additional clues as to the cause of meningitis.

Physical examination may provide clues to the aetiology of meningitis in affected patients:

- Morbilliform rash with pharyngitis and lymphadenopathy may suggest a viral aetiology (Epstein-Barr virus [EBV], cytomegalovirus [CMV], adenovirus, human immunodeficiency virus [HIV]).
- Macules and petechiae that rapidly evolve into purpura suggest meningococcaemia (with or without meningitis).
- Vesicular lesions in a dermatomal distribution suggest *Varicella zoster* virus.
- Genital vesicles suggest *Herpes simplex* virus (HSV)-2 meningitis.
- Sinusitis or otitis suggest direct extension into the meninges, usually with *Streptococcus pneumoniae* and *Haemophilus influenzae*.
- Rhinorrhoea or otorrhoea suggest a cerebrospinal fluid (CSF) leak from a basilar skull fracture, with meningitis most commonly caused by *Streptococcus pneumoniae*.
- Hepatosplenomegaly and lymphadenopathy suggest a systemic disease, including viral (for example, mononucleosis-like syndrome in EBV, CMV, and HIV) and fungal (for example, disseminated histoplasmosis) disease.
- The presence of a murmur suggests infective endocarditis with secondary bacterial seeding of the meninges.
- Evidence of parotitis is observed in some cases of mumps meningitis.

Kernig's Sign:

In a supine patient, flex the hip to 90° while the knee is flexed at 90°. An attempt to further extend the knee produces pain in the hamstrings and resistance to further extension.

Brudzinski’s Sign:

Passively flex the neck while the patient is in a supine position with extremities extended. This
manoeuvre produces flexion of the hips in patients with meningeal irritation.

Reference:

Answer Statistics

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Times answered: 8802

Test Analysis

Correct Incorrect Partially Correct

Score: 50.67%
Total Answered: 75
Question 36 of 50

A 17-year-old girl presents with three-day history of vaginal discharge and pruritus. She has recently completed treatment for UTI.

Which is the most likely causative organism?

(Please select 1 option)

- Bacterial vaginosis
- **Candida albicans**  Correct
- Chlamydia trachomatis
- Neisseria gonorrhoeae
- Trichomonas vaginalis

There is very little information given in this girl's case, save for the three-day history of vaginal discharge.

There is no information given with regard to discharge colour, sexual exposure, or whether the discharge is malodorous.

Without this information, you must consider the most likely organism as a cause of a vaginal discharge with few other symptoms, which is *Candida*.

You may feel this question is unfair but it reflects the questions in the examination that are 'probability' based.
A 41-year-old male has been diagnosed with infective endocarditis.

Which of the following is associated with the best prognosis?

(Please select 1 option)

- Aortic valve infection
- Intravenous drug abuse
- Prosthetic valve infection
- *Staphylococcus aureus* infection
- *Streptococcus viridans* infection  □ Correct

Features suggestive of a worse prognosis are:

- acute endocarditis (*Staphylococcus aureus*)
- heart failure
- IV drug abuse (often left and right-sided disease)
- prosthetic valve infection
- infection of the aortic rather than mitral valve, and
- associated rhythm disturbance.

Subacute bacterial endocarditis (*Streptococcus viridans*) has a better prognosis.
Work Smart

Question 37 of 50

Which of the following is the drug of choice for the treatment of *Chlamydia trachomatis* infection during pregnancy?

(Please select 1 option)

<table>
<thead>
<tr>
<th>Option</th>
<th>Choice</th>
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<tbody>
<tr>
<td>Amoxicillin</td>
<td>This is the correct answer</td>
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<td>Cephazolin</td>
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<td>Clindamycin</td>
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<td>Metronidazole</td>
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<tr>
<td>Tetracycline</td>
<td>Incorrect answer selected</td>
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</tbody>
</table>

*Chlamydia* infection in the non-pregnant state is usually treated with a tetracycline (doxycycline 100 mg BD for seven days), or with azithromycin 1 g in a single dose. Erythromycin and ofloxacin can be used if the first line treatments are contraindicated.

During pregnancy, tetracycline therapy is contraindicated because of its incorporation into fetal bones and teeth. Treatment options are therefore erythromycin or amoxicillin or azithromycin. Only amoxicillin fits from the options listed above.

Reference:

British Association for Sexual Health and HIV. [Guidelines](https://www.bashh.org/guidelines).
A 35-year-old man is seen six months after a cadaveric renal allograft. He receives azathioprine and prednisolone. He has felt generally unwell for the past week with a pyrexia of 38.6°C, anorexia and a cough productive of thick green sputum.

Chest x ray reveals a left lower lobe nodule of approximately 5 cm diameter with central cavitation. Analysis of the sputum reveals long, crooked, branching and beaded Gram positive filaments.

Which of the following antimicrobials is the most appropriate initial therapy for this patient?

(Please select 1 option)

- Ceftazidime
- Co-amoxiclav  □ Incorrect answer selected
- Co-trimoxazole  □ This is the correct answer
- Erythromycin
- Rifampicin and isoniazid

The likely diagnosis is nocardiosis.

*Nocardia* are aerobic, Gram positive branching filamentous bacteria which often appear beaded on staining. Nocardiosis can be diagnosed rapidly by examination of sputum or pus with the Gram stain and a modified acid-fast stain.

Pneumonia is typically found in the immunocompromised, as in this case and may be a single lesion or extensive pneumonic consolidation.
The drug of choice is trimethoprim-sulfamethoxazole.
An 82-year-old female is reviewed after the staff of the nursing home in which she resides express concern regarding a vaginal discharge.

She has been in the nursing home for the last one year with a profound Alzheimer’s dementia. Culture of the discharge reveals *Neisseria gonorrhoeae*.

Which is the most appropriate course of action for this patient?

(Please select 1 option)

- Contact the police
- Contact tracing of sexual partners
- Informal enquiry to the nursing home
- Seek advice from your medical defence organisation
- Treat the patient and discharge back to the nursing home

These ethical questions can be quite tough to answer with accuracy.

This question specifically relates to elder abuse, in this case, potential elder sexual abuse.

The scenario is one that is often played out in the press, in which a care worker sexually abuses elderly patients in his or her care. However, you are given very little information here and what you would do is undoubtedly treat the patient and establish how she contracted gonorrhoea.

The question states that she has profound dementia, suggesting that abuse has occurred rather than consensual sex. Nonetheless, you need to establish the facts.
You have a personal duty of care to the patient and next of kin to do this before contacting the police. It is likely that the police will need to be called but first, it would be worth talking things through and obtaining advice from your medical defence organisation. The advice may entail investigating the set-up at the nursing home, talking with the next of kin, (and social services if a social worker has been involved) and finely detailing any injuries that may be present on examination. Only then should the decision to contact the police be made.

Answer Statistics

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Times answered: 9470

Test Analysis

Correct Incorrect Partially
Correct
Work Smart

Question 38 of 50

Which of the following is correct concerning oseltamivir?

(Please select 1 option)

- It is a direct viral cytotoxic agent
- It is a haemaglutinase inhibitor
- It is administered via an inhaler
- It is effective if administered within 72 hours of symptoms of flu
- It is of value in prophylaxis against influenza

**Correct**

Oseltamivir (Tamiflu), like its predecessor zanamivir (Relenza) functions as an antiviral through inhibition of the enzyme neuraminidase, thus slowing viral replication down rather than directly killing the virus particle.

This slowing down of replication is important in permitting time for the body's own immune system to deal with the virus.

Unlike inhaled zanamivir, oseltamivir is administered orally.

However, viral replication is rapid and to be effective the drug must be given as early as possible after the development of symptoms of flu and preferably within 48 hours.
Which of the following investigations is used to monitor the treatment of infective endocarditis?

(Please select 1 option)

- Blood culture
- C reactive protein  
- Echocardiography
- Erythrocyte sedimentation rate
- Serum bactericidal titres of antibiotics

Serum bactericidal titres against the infecting organism are no longer recommended.

There was always great variation in the monitoring methods used for these tests and in the interpretation of their results. At best they could only predict bacteriological, not clinical cure, and bacteriological failure is very rare.

The most useful laboratory test for monitoring the response to treatment (which is usually obvious clinically) is serial C-reactive protein estimation.

This is of much more use than the erythrocyte sedimentation rate, which is much slower to fall.
Work Smart

Question 79 of 164

An elderly woman who had her right first metatarsal amputated two weeks previously for diabetic gangrene, presented with right foot pain, rash and fever. There were features of inflammation around the amputated area.

Which one of the following investigations would you like to order to confirm the diagnosis?

(Please select 1 option)

- Bone scan
- CT scan
- Indium-labelled leukocyte scanning
- MRI scan [Correct]
- Right foot x ray

Plain radiography of chronic osteomyelitis typically shows patchy osteopenia or frank bone destruction, loss of definition of the cortex, areas of sclerosis, or periosteal reaction with new bone formation. These changes take many weeks to develop fully.

For more rapid clarification of diagnosis, however, specialised imaging is needed.

Computed tomography (CT) scanning may be able to identify cortical erosion that has been missed on plain films and can demonstrate sequestra within bone.

There is a lack of sensitivity early in the disease. White cell isotope scanning is widely used but there is a lack of consensus on the utility of various tests.
Conventional three-phase technetium bone scans are sensitive but non-specific. Specificity may be increased by the addition of indium-labelled leukocyte scanning.

Magnetic resonance imaging (MRI) is the standard and best method for diagnostic imaging of osteomyelitis. It can detect intra- and extraosseous oedema, abscesses, dead bone, and sinus tracts. It can distinguish active from inactive infection.
A 27-year-old pop singer presented with a two-month history of loose motions and weight loss. He underwent a HIV antibody test and was found to be positive.

The presence of which of the following diseases most likely indicates a diagnosis of AIDS?

(Please select 1 option)

- Brucellosis
- Glandular fever
- Lyme disease
- Oral candidiasis
- Pulmonary tuberculosis

AIDS defining diseases are:

- *Cytomegalovirus* disease (other than liver, spleen, or nodes)
- *Cytomegalovirus retinitis* (with loss of vision)
- Encephalopathy, HIV-related
- *Herpes simplex*: chronic ulcer(s) (>1 month’s duration); or bronchitis, pneumonia, or oesophagitis
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (>1 month’s duration)
- Kaposi’s sarcoma
- Lymphoma, Burkitt’s (or equivalent term)
• Lymphoma, primary, of brain
• *Mycobacterium avium* complex or *M. kansasii*, disseminated or extrapulmonary
• *Mycobacterium tuberculosis*, any site (pulmonary or extrapulmonary)
• *Mycobacterium*, other species or unidentified species, disseminated or extrapulmonary
• *Pneumocystis jirovecii* pneumonia
• Pneumonia, recurrent
• Progressive multifocal leukoencephalopathy
• *Salmonella* septicaemia, recurrent
• Toxoplasmosis of brain
• Wasting syndrome due to HIV.

Further Reading:

**Work Smart**

**Question 81 of 164**

A 16-year-old boy presents with scaly patches on his scalp. Examination reveals well circumscribed, circular areas of hair loss, 2-5 cm in diameter with scaling and raised margins. There is no scarring.

Which is the most likely cause in this patient?

(Please select 1 option)

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<tr>
<td>☐</td>
<td>Discoid lupus erythematosus</td>
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<td>Lichen planus</td>
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<td>☐</td>
<td>Morphea</td>
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<tr>
<td>☐</td>
<td>Systemic lupus erythematosus</td>
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<td>☐</td>
<td>Tinea capitis  ☑ Correct</td>
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</table>

This patient had non-scarring alopecia due to invasion of hairs by dermatophytes, most commonly *Trichophyton tonsurans*.

The most common causes of nonscarring alopecia include telogen effluvium, androgenetic alopecia, alopecia areata, *tinea capitis*, and traumatic alopecia.

Less commonly, non-scarring alopecia is associated with lupus erythematosus and secondary syphilis.

Scarring alopecia is more frequently the result of a primary cutaneous disorder such as lichen planus, folliculitis decalvans, cutaneous lupus, or linear scleroderma (morphea).
A 47-year-old man presents with progressive right hand swelling, two days after being bitten by a dog.

On examination, there is a puncture wound with pus over the dorsum of the hand, cellulitis, ascending lymphangitis and tender axillary lymphadenopathy.

Which is the most appropriate antibiotic therapy in this case?

(Please select 1 option)

- Benzylpenicillin and flucloxacillin [Incorrect answer selected]
- Ceftriaxone
- Ciprofloxacin
- Co-amoxiclav [This is the correct answer]
- Erythromycin

Only 15 - 20% of dog bites become infected, and providing the wound is appropriately cleaned and not considered at risk (for example, crush or deep wounds) then antibiotic prophylaxis may not be required.

However, this patient has an infected wound and infective organisms include Pastuerella spp, Staph. aureus and anaerobes like Corynebacterium.

The most appropriate antibiotic therapy in dog bites associated with cellulitis would be co-amoxiclav.
A 57-year-old woman develops a blistering rash around the midriff and is diagnosed with *Herpes zoster*. She is treated with aciclovir.

Which of the following is responsible for the activation of aciclovir?

(Please select 1 option)

- ☐ Integrase
- ☐ Polymerase
- ☐ Protease
- ☑ Reverse transcriptase  □ Incorrect answer selected
- ☑ Thymidine kinase  □ This is the correct answer

This is a variation on the aciclovir theme.

Aciclovir acts through inhibition of viral deoxyribonucleic acid (DNA) polymerase but it is a pro-drug and first requires phosphorylation by thymidine kinase.
A 56-year-old man diagnosed with systemic inflammatory response syndrome (SIRS) secondary to pneumonia is admitted to the high dependency unit.

On examination, he has a temperature of 39°C, a respiratory rate of 30/min, has a pulse of 109 beats/min and a blood pressure of 89/74 mmHg despite receiving IV fluids and urine output of 25 ml/hour after catheterisation.

Which of the following should be instituted immediately and should be accomplished within the first six hours of presentation?

(Please select 1 option)

- Administer drotrecogin alfa (activated protein C)
- Administer intravenous furosemide
- Administer low dose steroids □ Incorrect answer selected
- Institute tight glucose control
- Obtain blood cultures prior to antibiotic administration □ This is the correct answer

The Surviving Sepsis Campaign (a partnership of the Society of Critical Care Medicine, the European Society of Intensive Care Medicine, and the International Sepsis Forum) has teamed up with the Institute for Healthcare Improvement to develop severe sepsis bundles. A 'bundle' is a group of interventions related to a disease process that, when executed together, result in better outcomes than when implemented individually.
Sepsis Resuscitation Bundle:

Should begin immediately, but must be accomplished within the first six hours of presentation.

1. Serum lactate measured.
2. Blood cultures obtained prior to antibiotic administration.
3. From the time of presentation, broad-spectrum antibiotics administered within three hours for ED admissions and one hour for non-ED ICU admissions.
4. In the event of hypotension and/or lactate > 4 mmol/l (36 mg/dl):
   1. Deliver an initial minimum of 20 ml/kg of crystalloid (or colloid equivalent).
   2. Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain mean arterial pressure (MAP) > 65 mm Hg.
5. In the event of persistent hypotension despite fluid resuscitation (septic shock) and/or lactate > 4 mmol/l (36 mg/dl):
   1. Achieve central venous pressure (CVP) of > 8 mm Hg.
   2. Achieve central venous oxygen saturation (ScvO₂) of > 70%.

Sepsis Management Bundle:

To be accomplished as soon as possible may be completed within twenty-four hours of presentation.

1. Low-dose steroids administered for septic shock in accordance with a standardised ICU policy.
2. Glucose control maintained > lower limit of normal, but < 150 mg/dl (8.3 mmol/L).
3. Inspiratory plateau pressures maintained < 30 cm H₂O for mechanically ventilated patients

Drotrectogin alpha (activated protein C) used to be recommended by NICE for the treatment of severe sepsis. However, in October 2011 the company withdrew this from the market following the results of the PROWESS-SHOCK study, which showed there was no statistically significant reduction in 28-day all-cause mortality in patients with septic shock.

Reference:

A 45-year-old HIV-seropositive man attended the outpatient clinic for the results of a fasting serum lipid test.

He had been diagnosed with HIV disease two years previously and was started on highly active antiretroviral therapy. One year after commencing antiretrovirals, his CD4 count had risen from 10 cells/mm$^3$ to 120 cells/mm$^3$ with an undetectable viral load.

His current medications consisted of zidovudine, lamivudine, lopinavir, aciclovir, fluconazole, and co-trimoxazole.

Fasting lipid profile revealed:

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<thead>
<tr>
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<th>Value</th>
<th>Normal Range</th>
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<tbody>
<tr>
<td>Serum cholesterol</td>
<td>4.1 mmol/L</td>
<td>(&lt;5.2)</td>
</tr>
<tr>
<td>Serum triglyceride</td>
<td>18.2 mmol/L</td>
<td>(0.45-1.69)</td>
</tr>
</tbody>
</table>

Which of the following medications is most likely to be responsible for these results?

(Please select 1 option)

- Co-trimoxazole
- Fluconazole
- Lamivudine
- Lopinavir  □ Correct
- Zidovudine
Lipodystrophy, lipoatrophy, and alterations in serum lipid values have been observed in patients with human immunodeficiency virus (HIV) disease who are taking highly active antiretroviral therapy.

Elevated serum lipid levels have been associated with premature coronary artery disease.

Hypertriglyceridaemia is also thought to contribute to central fat deposition and insulin resistance that is also seen in these patients.

Abnormalities of serum lipid levels are likely to be multifactorial in patients with HIV disease, but appear much commoner in patients taking protease inhibitors.

Isolated hypertriglyceridaemia can occur in HIV disease in the absence of protease inhibitors, but extremely high serum triglycerides have been documented in some patients treated with these drugs.

If the elevation in lipid levels is modest, measures such as dietary modification and exercise may be tried first. Omega-3 fish oils may also be beneficial in reducing modestly elevated serum triglycerides.

In refractory cases, or where there is extreme isolated hypertriglyceridaemia, a fibrate should be used.

In addition, patients with HIV disease may also have elevated serum lipid levels due to familial hyperlipidaemia.
Three elderly patients presented with cough, fever and general malaise on return from holiday to Spain.

The group of 50 had travelled together, engaging in visits to hillside forestry, and fishing in mountain streams. They had been housed in different hotels. The three people who presented with illness all stayed in the same hotel.

Which of the following organisms is most likely to be responsible for their illness?

(Please select 1 option)

- Borrelia burgdorferi
- Legionella pneumophila
- Leptospira icterohaemorrhagiae
- Mycoplasma pneumoniae
- Pneumococcus

This is a typical story for Legionnaires' disease caused by Legionella pneumophila.

The condition was described first in a veterans' legion conference in a similar fashion to the above description.

Contaminated air conditioning units are often to blame.

Weil's disease is unlikely given the story as is Lyme disease (Borrelia burgdorferi).
An 18-year-old male presented with a two-week history of dysuria and purulent penile discharge. Gram stain of a urethral swab showed Gram negative intracellular diplococci.

What specific treatment should he receive?

(Please select 1 option)

- Cefixime  □ Correct
- Cephradine
- Ciprofloxacin
- Co-amoxiclav
- Crystalline penicillin

*Neisseria gonorrhoeae* occurs in young adults and is often preceded by a migratory tendonitis or arthritis. Gram stain is positive in 25% and culture positive in 50%.

Current UK guidelines recommend ceftriaxone 500 mg IM and azithromycin 1 g PO stat, where the diagnosis is confirmed and the infection is uncomplicated and localised to the anogenital region. A test of cure (with culture >72 hours or nucleic acid amplification testing >2 weeks) is recommended in all cases, and treatment failure should be reported to Public Health England or your local Health Protection Agency. Both in the UK and worldwide there is widespread resistance to penicillins, tetracyclines and ciprofloxacin and these agents are therefore not generally recommended.

Alternatives to the regime described above are:
- Cefixime 400 mg PO stat (if IM treatment contra-indicated or refused)
- Cefotaxime 500 mg IM stat or cefoxitin 2 g IM plus probenecid 1 g PO
- Spectinomycin 2 g IM stat (in beta-lactam allergic patients, currently off-licence)
- Cefpodoxime 200 mg PO stat
- Azithromycin 2 g stat

Fluoroquinolones are no longer used as first-line treatment due to the high rate of resistance. They can be considered in patients who have previously responded to treatment with a quinolone, but not in a case such as this.

Bearing all this in mind, the most appropriate option of those listed above is cefixime.

Reference:

- Patient.info. Gonorrhoea.
An 18-year-old student presented to hospital two days after returning from visiting family in India. Within twenty-four hours of his return to the United Kingdom, he suddenly developed profuse watery diarrhoea. Initially, he did not have any nausea, vomiting or stomach cramps, but these developed within a day. He described the diarrhoea as looking like cloudy water but without any blood or mucus. He was opening his bowels over 20 times per day.

On examination he looked pale; he was afebrile. Skin turgor was reduced and mucous membranes were dry.

Stool culture revealed a growth of *Vibrio cholerae*.

Which is the most appropriate antibiotic to administer?

(Please select 1 option)

- Ceftriaxone
- Doxycycline **This is the correct answer**
- Meropenem **Incorrect answer selected**
- Metronidazole
- Piperacillin plus gentamicin

Cholera has a short incubation period of 24-48 hours.

The illness begins with the sudden onset of painless, watery diarrhoea. The diarrhoea may be accompanied later by abdominal cramps, nausea and vomiting. Patients are usually afebrile. The
Diarrhoea is typically described as having the appearance of rice water and a faintly fishy smell. The diarrhoea may be copious and result in hypovolaemic shock unless fluids are administered.

The primary aim of treatment is to restore fluid balance; antibiotics have a secondary role. However, antibiotics have been shown to reduce fluid loss and hasten clearance of the organism from the gut.

Appropriate antibiotics include:

- Tetracycline
- Doxycycline
- Ciprofloxacin
- Erythromycin
- Co-trimoxazole.

Tetracycline is usually the first line drug of choice, although resistance is emerging in certain parts of the world.
A 23-year-old female presents 16 weeks into her pregnancy with a vaginal discharge. Further investigation confirms infection with *Chlamydia trachomatis*.

Which of the following is the most appropriate treatment for this patient?

(Please select 1 option)

- Ciprofloxacin
- Cotrimoxazole
- Doxycycline
- Erythromycin
- Metronidazole

*C. trachomatis* infection is increasingly common in the UK and is associated with adverse fetal outcome including spontaneous miscarriage, premature rupture of membranes and intrauterine growth retardation (IUGR).

In the UK, treatment is advised ahead of test results if chlamydia is strongly suspected clinically. Current UK guidelines recommend three different options in pregnancy:

- Erythromycin 500 mg QDS for 7 days or BD for 14 days
- Amoxicillin 500 mg TDS for 7 days
- Azithromycin 1 g stat - the BNF cautions that this should only be used if there are no alternatives. However, guidelines seem to vary in their recommendation of azithromycin with
many advocating its use as a stat dose

In the actual examination you would not be expected to decide *between* erythromycin and azithromycin-based on varying opinions, so we have avoided including azithromycin and amoxicillin in the list of question options for this reason.

Therefore, of the options given above, erythromycin is the most appropriate option.

Doxycycline can be used in non-pregnant patients (100 mg BD for seven days) but is not appropriate here. Co-trimoxazole and metronidazole are not routinely used in the treatment of chlamydia.

Also important to note is the recommendation that pregnant patients be tested for cure, five weeks after completing treatment (or six weeks if azithromycin is used).

Answer Statistics

Times answered: 9675

Test Analysis

Correct Incorrect Partially Correct
A 30-year-old schoolteacher is admitted with headache, photophobia and neck stiffness. His temperature is 39.0°C, pulse rate 120 beats/min and he has no skin rash or focal neurological signs. His Glasgow coma scale is 15/15. A CT scan shows no contraindication to lumbar puncture. CSF is obtained and Gram stain shows Gram-positive cocci, subsequent culture confirms pneumococcal meningitis.

What chemoprophylaxis should be offered to his pupils?

(Please select 1 option)

- Azithromycin
- Ceftriaxone
- Ciprofloxacin
- No chemoprophylaxis required
- Rifampicin

Chemoprophylaxis is not normally indicated for close contacts of those with pneumococcal meningitis.

Chemoprophylaxis with rifampicin, ceftriaxone, ciprofloxacin or azithromycin is used for meningococcal meningitis.

Close contacts of *Haemophilus influenzae* meningitis should receive rifampicin; children under two years should be vaccinated.
A 24-year-old female student presented with fever and rigors for two days, fatigue, headache (especially retro-orbital), and diarrhoea. In particular she complained of a weakness of the left side of her face and drooping of the lip.

She had recently returned from a sabbatical in Uganda four weeks previously.

She was febrile (39.9°C), had a mild left facial nerve palsy, lymphadenopathy in her axillae and groin, and she had an erythematous, maculopapular rash.

Laboratory investigations showed:

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<tr>
<td>WBC</td>
<td>$3.0 \times 10^9$/L</td>
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</tr>
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<td>Platelets</td>
<td>$150 \times 10^9$/L</td>
<td>(150-400)</td>
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<tr>
<td>Blood film</td>
<td>Lymphopenia, some atypical lymphocytes seen</td>
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</table>

Which of the following is the most likely diagnosis?

(Please select 1 option)

- **Acute HIV infection (seroconversion illness)** — Correct
- Dengue fever
- Infectious mononucleosis
- Typhoid fever
Acute human immunodeficiency virus (HIV) seroconversion illness should be suspected where there has been a risk of exposure.

The symptoms and signs are often vague but the clinical presentation here is consistent. The median time from exposure to presentation is 25 days.

More than three-quarters of patients who become infected with HIV develop symptoms consistent with primary HIV infection.

Symptoms typically appear a few days to a few weeks after exposure to HIV, and generally include several of the following:

- Fever
- Rash, often erythematous maculopapular
- Fatigue
- Pharyngitis
- Generalised lymphadenopathy
- Urticaria
- Myalgia/arthralgia
- Anorexia
- Mucocutaneous ulceration
- Headache, retro-orbital pain
- Neurologic symptoms, e.g. aseptic meningitis, radiculitis, myelitis.

Reference:

AIDS Education & Training Centers National Resource Center. Primary HIV Infection.
A 20-year-old man presented to hospital two days after returning from visiting his family in Bangladesh.

Within a day of his return to the United Kingdom, he suddenly developed profuse watery diarrhoea. He says there had been an outbreak of diarrhoea in his family’s village in the week before his return.

Stool culture revealed a growth of *Vibrio cholerae*.

Which one of the following blood types is associated with the greatest susceptibility to severe cholera?

(Please select 1 option)

- Blood Group A
- Blood Group AB
- Blood Group B
- Blood Group O  □ Correct
- Rhesus -ve

Harris et al.\(^1\) write that "Individuals with blood group O are more susceptible than other individuals to severe cholera, although the mechanism underlying this association is unknown."

Reference:

1. Harris JB, Khan AI, LaRocque RC, et al. *Blood group, immunity, and risk of infection with*
Question 89 of 164

A 23-year-old male presented with a two-week history of dysuria and purulent penile discharge. Gram stain of a urethral swab showed Gram negative intracellular diplococci.

Which one of the following is the most likely causative organism?

(Please select 1 option)

- Chlamydia trachomatis
- Cytomegalovirus
- Mycoplasma hominis
- Neisseria gonorrhoeae ✔ Correct
- Ureaplasma urealyticum

*Neisseria gonorrhoeae* occurs in young adults and is often preceded by a migratory tendonitis or arthritis. Gram stain is positive in 25% and culture positive in 50%.

*Neisseria gonorrhoeae* is a species of Gram-negative bacteria responsible for the disease gonorrhoea. They are highly fastidious Gram-negative cocci, that is, they require special nutrients to survive. These cocci typically appear in pairs (diplococci).

*Chlamydia trachomatis* is an intracellular organism but is difficult to stain with Gram stain which makes gonorrhoea more likely here.

The other three organisms described here do not classically present with these symptoms.
A 35-year-old man presented after several days of high fever and headache, which began to resolve. He presents now with jaundice on returning from a holiday in Spain.

As part of a group of 20, he had visited hillside forests and went fishing in mountain streams.

Which of the following organisms is most likely to be responsible for his illness?

(Please select 1 option)

- Borrelia burgdorferi
- Legionella pneumophila
- Leptospira icterohaemorrhagiae
- Mycoplasma pneumoniae
- Pneumococcus

Leptospirosis, or Weil's disease, is transmitted to man by animals, including rodents (rat urine and faeces), skunks, foxes, cattle, dogs.

The disease is characterised by the following:

- jaundice
- fever
- oliguria
- headache
- myalgia
- haemorrhagic tendencies with purpura or petechiae, and
- enlargement of liver and spleen.

Feedback
Following your morning surgery, you receive a telephone call from the lab at the local hospital regarding an 82-year-old patient of yours whom you admitted from her nursing home with headache, photophobia and neck stiffness.

When you saw her, her temperature was 39.0°C, pulse rate 115 beats/min and there were no skin rashes or focal neurological signs. Her Glasgow coma scale was 15/15.

Following admission, CSF was obtained and Gram stain showed Gram-negative coccobacilli, subsequent culture confirms a *Haemophilus influenzae* meningitis.

What chemoprophylaxis should be offered to the nurses at her home?

(Please select 1 option)

- Azithromycin
- Ceftriaxone
- Chloramphenicol
- No chemoprophylaxis required
- Rifampicin  
  
  Correct

The decision to give chemoprophylaxis to contacts of patients with confirmed meningitis is usually made by Public Health England or the appropriate public health agency. However, it is important to be aware of the basic principles.

With regard to *Haemophilus influenzae*, prophylaxis is recommended for three main groups:
Household contacts: any non-immunised contact, under 4 years of age, should receive the Hib vaccine. Rifampicin should also be given once daily (at 20 mg/kg), for four days (unless the patient is less than 4 and has been fully immunised). Nurses, in this case, would likely qualify as household contacts, but this should be discussed with the HPU.

- The index case should be immunised, irrespective of age.
- Room contacts of children in playgrounds, nurseries or creches. Any unimmunised children less than 4 years of age should be vaccinated. Chemoprophylaxis should be offered when two or more cases of Hib disease have occurred within 120 days.

Recommendations from the Department of Health and Public Health England state:

"Rifampicin at a dose of 20 mg/kg (maximum 600 mg) once a day for four days for adults and children older than three months is the prophylaxis of choice for eliminating carriage in the index case and among household contacts (STRONGLY RECOMMENDED) because it is highly effective (eradication rate of 92-97%) and Hib resistance to rifampicin is extremely rare (<0.1%) in the UK".

Ciprofloxacin is an acceptable alternative.

Reference:

A 45-year-old man has been diagnosed with pulmonary tuberculosis.

Which of the following investigations is essential prior to starting antituberculous therapy?

(Please select 1 option)

- Full blood count
- Liver function test
- Plasma glucose
- Urine for acid-fast bacilli
- Vitamin B6

Hepatotoxicity is a feature of antituberculous treatment.

The Joint Tuberculosis Committee of the British Thoracic Society recommend that liver function should be checked before treatment for clinical cases.

Reference:

A young girl returns from a trip to India with a protracted history of watery diarrhoea. Giardiasis is suspected but three stool samples are negative.

What is the best investigation to confirm *Giardia* as a diagnosis?

(Please select 1 option)

- CT abdomen
- Rectal biopsy
- Serum IgM *Giardia* antibodies
- Small intestine biopsy
- Stool microscopy

Current evidence is that initial investigation for *Giardia* is microscopy of three stool samples. However, if repeated stool samples are negative and symptoms continue, current NHS guidelines suggest that endoscopy is the best way to confirm the diagnosis. Samples from this can demonstrate the parasite.

Some laboratories are now using stool antigen tests, but this is not widely available and is usually only used during a suspected outbreak. Serum antibody tests, in contrast, will only be able to tell if there has been exposure to the infection not necessarily active infection.

There are no findings on rectal biopsy or CT abdomen which are specific to *Giardia*. 
Work Smart

Question 93 of 164

A patient presents with a 36-hour history of varicella zoster in the T4 dermatome. She complains of severe pain in the skin supplied by T4.

What is the most appropriate management?

(Please select 1 option)

- **Aciclovir**  ✔️ Correct
- Carbamazepine
- Famciclovir
- Nothing
- Prednisolone

Aciclovir and famciclovir may be used to treat herpes zoster. They both reduce time to healing and resolution of associated pain.

Aciclovir is now a generic medication and therefore will be cheaper than famciclovir and is the most cost effective of the treatments listed.

Early use of steroids in herpes zoster may also reduce the amount of analgesia required and the length of illness.

A clinical review of the treatment of herpes zoster was included in the BMJ in 2003. The main take home message was that appropriate treatment of herpes zoster can control acute symptoms and reduce the risk of longer-term complications.
In March 2010, NICE updated their guidance on the treatment of neuropathic pain. First line treatment of post-herpetic neuralgia would now include amitriptyline or pregabalin.

CKS have also issued guidance on the treatment of herpes zoster. This guidance is generally in keeping with that issued by NICE. They add that, although carbamazepine has evidence to support its use in the treatment of post-herpetic neuralgia, the potential for serious adverse side effects and the lack of a licence has prevented them from recommending it as a primary care treatment.

Reference:

2. NICE. Neuropathic pain - pharmacological management (CG173).
Question 94 of 164

Deficiency of which of the following components of the complement system predisposes to infection with *Neisseria meningitidis*?

(Please select 1 option)

- C1q
- C1r
- C1s
- C3 **Correct**
- C4

The complement system often gives rise to questions in the MRCP examination. It would be wise to make a cursory review of this topic.

C3 is the point at which the classical, alternative, and lectin complement pathways converge.

C1qrs, C2, and C4 are strongly associated with systemic lupus erythematosus (SLE).

Patients with C3 deficiency, be it absolute, relative, genetically determined (autosomal dominant or recessive), or due to properdin deficiency, are predisposed to recurrent infection with encapsulated proteins, particularly *N. meningitidis*.

C5 deficiency is associated with Leiner's disease, a syndrome of recurrent diarrhoea, wasting, and generalised seborrhoeic dermatitis presenting in infants.
Question 95 of 164

A 45-year-old teacher presents six weeks after he returns from a hiking holiday in South America with a shallow, painless ulcer of the nose.

Which of the following is the likely diagnosis?

(Please select 1 option)

- Fusobacterium ulcerans
- Leishmaniasis ☑ Correct
- Squamous cell carcinoma
- Trichomoniasis
- Trypanosomiasis

Given the history, the likely diagnosis is cutaneous leishmaniasis. Lesion pain and pruritus may be present in cutaneous leishmaniasis but is not typical.

Diagnosis is by histologic section with staining for amastigotes.

Leishmania braziliensis is the likely pathogen which is spread by sandfly bites in endemic areas.

Fusobacterium causes the tropical ulcer which is an intensely painful, shallow ulcer.
Question 96 of 164

Which of the following statements is true about immunological reactions?

(Please select 1 option)

- Angio-neurotic oedema is the most severe form of type I reaction
- Deficiencies in the terminal components of complement increase the risk of meningococcal disease □ Correct
- Graves' Disease is caused by a type IV reaction
- Serum sickness is caused by a type II reaction
- Urticaria usually responds to Cimetidine

Serum sickness is due to circulating antibody-antigen complexes (Type III).

Graves' Disease is due to stimulating antibody (Type V). The most severe variety of Type I reaction is anaphylaxis, with angioedema an intermediate reaction associated with wheeze and swelling of the lips and severe urticaria. These reactions are mediated by histamine 1 receptor stimulation.

Congenital C1 inhibitor deficiency is also caused hereditary angioedema. Deficiencies in C1r, s, and 2-4 result in vasculitides; while deficiencies in C2, 3 and 5-8 are associated with an increased risk of septicaemia.

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A 14-year-old boy presents with a high fever, cervical lymphadenopathy and pus on the tonsils.

Which of the following statements regarding diagnosis and management is true?

(Please select 1 option)

- **Amoxicillin may cause an erythematous rash**
- Cefotaxime is the treatment of choice
- If his CRP is 40, then Group A streptococcal infection is highly likely
- If urinary red cells are present then a renal biopsy is indicated
- Tonsillectomy is indicated after the acute infection has settled

This is a common problem in paediatrics, general practice and medical admissions, and unfortunately, on clinical appearances, it is not possible to distinguish bacterial from viral or throat infections with any degree of reliability.

Urinary red cells may indicate a secondary post-streptococcal glomerulonephritis, but a renal biopsy is unlikely to be indicated.

A group A streptococcal infection should certainly be considered in this case, and probably covered with oral penicillin-v, but reliable clinical diagnosis is not possible.

If the child has EBV infection, then the administration of Amoxicillin will give an erythematous rash. Non-vomiting patients can be treated with oral penicillin-v.

Cefotaxime, although it would probably be effective, requires IV administrations, which does not seem...
warranted on the information given.

Tonsillectomy should be reserved for those with recurrent tonsillitis not responding to prophylactic antibiotics.

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<th>Answer</th>
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Times answered: 7132

Score: 51.55%

Total Answered: 97
A 17-year-old girl underwent emergency splenectomy after a domestic accident.

Which one of the following organisms is most likely to cause life-threatening infection in the future?

(Please select 1 option)

- Actinomycosis
- *Listeria monocytogenes*
- *Salmonella enteritidis*
- *Staphylococcus aureus*
- *Streptococcus pneumoniae*  
  - Correct

Following splenectomy a person is particularly at risk from capsulated organisms. The most important are:

- *Streptococcus pneumoniae*
- *Haemophilus influenzae*, and
- *Neisseria meningitides*.

Vaccination may be given.

Other important infections with increased risk are:

- *Staphlococcus aureus*
- *Escherichia coli*
- *Pseudomonas aeruginosa*
- *Capnocytophaga canimorsus* (from dog bites), and
- malaria.

By far the most common is *Streptococcus pneumoniae* which can cause life-threatening infection. The mortality of post-splenectomy septicaemia can be up to 50%.

**Answer Statistics**

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Times answered: 9799

**Test Analysis**

Correct | Incorrect | Partially Correct
---|---|---
Correct

Score: 52.04%

Total Answered: 98
A 16-year-old girl presented with fever, headache and photophobia.

Cerebrospinal fluid examination revealed:

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<td>Total protein</td>
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<td>Glucose</td>
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<td>White cell count</td>
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<td>Lymphocytes</td>
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<tr>
<td>Plasma glucose</td>
<td>6.4 mmol/L</td>
<td>(3.0-6.0)</td>
</tr>
</tbody>
</table>

What is the most likely diagnosis?

(Please select 1 option)

- Bacterial meningitis
- Cryptococcal meningitis
- Tuberculosis meningitis
- Viral encephalitis
- Viral meningitis

Correct
Normal cerebrospinal fluid (CSF) glucose together with:

- a CSF lymphocytosis
- an increased opening pressure, and
- a raised CSF protein

are typical of viral meningitis, which would be high on the list of differentials in patients of this age group (together with bacterial meningitis).

Reference:

1. GP Notebook. Abnormal CSF values.
A 46-year-old homosexual HIV positive man presents with a two-week history of weakness of his right arm and leg.

Examination reveals right hemiparesis and left cerebellar signs. CT scan shows white matter lesions in the left cerebellar region and left temporoparietal area. There is no midline shift or surrounding oedema.

Which one of the following is most likely to be found in his cerebrospinal fluid (CSF)?

(Please select 1 option)

- Positive cytomegalovirus (CMV) PCR
- Positive Epstein-Barr virus (EBV) PCR
- Positive herpes simplex virus (HSV) PCR
- Positive human herpes virus (HHV) 8 PCR
- Positive JC PCR  □ Correct

Multifocal lesions in left cerebellar and temporoparietal white matter areas without any mass effect or surrounding oedema are most likely to be due to progressive multifocal leucoencephalopathy (PML).

JC virus causes PML in immunocompromised patients especially when the CD4 count is below 100 cells/mm$^3$.

CMV polymerase chain reaction (PCR) may be found in CMV encephalitis. It is clinically not a typical feature of CMV encephalitis.
Positive EBV PCR indicates primary brain lymphoma where CT scan often shows significant mass effect with surrounding oedema.

HSV PCR may be found in HSV encephalitis which commonly affects temporal lobes in patients with good CD4 count.

HHV 8 PCR is usually associated with Kaposi’s sarcoma.

Answer Statistics

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Times answered: 6298

Test Analysis

Correct | Incorrect | Partially Correct

Score: 53%
Total Answered: 100
A 39-year-old Caucasian man with symptomatic HIV disease developed multiple, painless, umbilicated papular lesions on his face.

Which of the following is the most likely cause of his skin lesions?

(Please select 1 option)

- Cytomegalovirus (CMV)
- Epstein Barr virus (EBV)
- Human herpes virus (HHV) 8
- Human papilloma virus (HPV 16)
- Pox virus

Multiple painless umbilicated papular lesions are typical of molluscum contagiosum and are caused by pox virus.

CMV does not cause painless papular lesions.

EBV causes Burkitt's lymphoma, non-Hodgkin's lymphoma, and primary brain lymphomas.

HHV 8 is strongly associated with Kaposi’s sarcoma.

HPV 16 is associated with squamous cell carcinomas in cervix, penis, anus and oral cavity.

Reference:

Answer Statistics

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Times answered: 6283

Test Analysis

Correct| Incorrect| Partially Correct

Score: 52.48%
Total Answered: 101
Question 102 of 164

A 48-year-old African man with HIV was prescribed a combination of antiretroviral therapy. He developed increased diffuse pigmentation of the nails in both hands and toes.

Which of the following is the most likely cause of the increased pigmentation of the nails?

(Please select 1 option)

- Efavirenz
- Lamivudine
- Nevirapine
- Tenofovir
- Zidovudine

Zidovudine causes increased pigmentation of the nails in black patients.

Efavirenz causes central nervous system toxicity not hyperpigmentation.

Lamivudine does not normally cause hyperpigmentation of nails but it can occasionally cause hyperpigmentation of the skin in black people.

Nevirapine does not cause hyperpigmentation of skin but can cause acute hepatitis and skin rash.

Tenofovir can cause proximal tubular damage hence Fanconi-like syndrome.

Reference:

Furth PA, Kazakis AM. Nail pigmentation changes associated with azidothymidine (zidovudine). Ann
A 35-year-old, HIV-positive, African woman presented with weakness of both legs and double incontinence.

CSF showed increased protein and neutrophils with normal glucose.

Which of the following is the most likely cause of her weakness?

(Please select 1 option)

- CMV polyradiculomyelopathy  
  - This is the correct answer
- Guillain-Barré syndrome  
  - Incorrect answer selected
- Herpes virus encephalitis
- HIV encephalopathy
- Toxoplasma encephalitis

Symptoms are suggestive of polyradiculomyelopathy (weakness of legs with involvement of sphincters).

Increased neutrophils are found in CMV polyradiculomyelopathy but not in Guillain-Barré syndrome.

HIV encephalopathy usually causes confusion and memory loss. It does not involve sphincters.

Guillain-Barré syndrome causes polyradiculopathy, explaining all her symptoms, but with normal cell counts and raised protein in the CSF.

Herpes simplex encephalitis causes fever, headache, confusion, and deteriorating level of
consciousness.
Question 104 of 164

A 51-year-old homosexual, Caucasian, HIV positive man developed multiple violaceous painless lesions on his trunk.

Which one of the following is the most likely cause of his skin lesions?

(Please select 1 option)

- [ ] Cytomegalovirus (CMV)
- [x] Human herpes virus 8 (HHV 8)  [Correct]
- [ ] Human herpes virus 10 (HHV 10)
- [ ] Human papilloma virus 16 (HPV 16)
- [ ] Pox virus

Multiple violaceous painless lesions are typical of Kaposi's sarcoma in Caucasians. This is associated with HHV 8.

CMV and HHV 10 do not cause multiple violaceous painless lesions.

HPV 16 is an oncogenic virus which causes squamous cell carcinomas.

Pox virus causes molluscum contagiosum.
A 32-year-old African woman with HIV presents with a two-week history of greenish, frothy, itchy vaginal discharge.

What is the most likely cause of her discharge?

(Please select 1 option)

- *Candida albicans* infection
- *Chlamydia* infection
- Foreign body
- Gonorrhoea infection
- *Trichomonas vaginalis* infection **Correct**

*Trichomonas vaginalis* causes itchy, frothy, greenish vaginal discharge.

*Candida albicans* causes a white, curdy, itchy vaginal discharge.

*Chlamydia* and gonorrhoea do not cause itchy, frothy, vaginal discharge and both can be asymptomatic.

Foreign body causes foul smelling vaginal discharge.

Further Reading:

Work Smart

Question 106 of 164

Which of the following is a sign of immunodeficiency in the mouth?

(Please select 1 option)

- Gingivitis
- Herpes labialis
- Leucoplakia
- Oral hairy leucoplakia  □ Correct
- Oral wart

Oral hairy leucoplakia is a sign of immunodeficiency. It is due to reactivation of Epstein-Barr virus infection.

Gingivitis is not a sign of immunodeficiency.

Leucoplakia is not a sign of immunodeficiency but it is a precancerous lesion.

Herpes labialis is due to herpes simplex infection, which causes 'cold sores' in immunocompetent patients and chronic herpes labialis in immunocompromised patients.

Oral warts can occur in healthy people. They are due to HPV infection usually due to benign types, 6 and 11.
Work Smart

Question 107 of 164

Which one of the following antiretrovirals is likely to cause increased pigmentation of the skin in a black African patient?

(Please select 1 option)

- Didanosine
- Efavirenz
- Emtricitabine
- Nevirapine
- Stavudine

Emtricitabine causes hyperpigmentation of the skin, including palmar creases, in 8% of black patients.

Didanosine and stavudine cause mitochondrial toxicity, hence peripheral neuropathy, pancreatitis and hyperlactataemia.

Efavirenz causes CNS toxicity.

Nevirapine causes acute hepatitis and skin rash.

Reference:

Rashbaum B. Evaluation of Hyperpigmentation in HIV-Infected Patients Receiving Emtricitabine. 3rd IAS Conference on HIV Pathogenesis and Treatment. 2005:TuPe2.4C15
A 34-year-old homosexual Caucasian man developed jaundice two months after taking a combination of antiretroviral drugs.

He admitted that he had had several episodes of unprotected sex with several casual male partners. His liver function showed raised bilirubin with normal transaminases and alkaline phosphatase.

Which of the following is the most likely cause of his jaundice?

(Please select 1 option)

- Acute hepatitis B
- Alcoholic hepatitis
- Atazanavir ✅ Correct
- Efavirenz
- Nevirapine

Atazanavir causes hyperbilirubinaemia with normal transaminases and alkaline phosphatase (mimicking Gilbert's syndrome).

Acute hepatitis B is unlikely with normal transaminases and alkaline phosphatase.

A mild to moderate rise in transaminases and alkaline phosphatase occurs in alcoholic hepatitis.

Efavirenz can cause acute hepatitis with raised levels of transaminases.

Nevirapine causes acute hepatitis where transaminases are raised several-fold.
A 47-year-old Portuguese former intravenous drug abuser presented with a two-week history of right hemiparesis.

He was found to have hepatitis B and C infection. His absolute lymphocyte count was $0.6 \times 10^9/L$. CT of the head showed multiple ring-enhanced lesions.

Which of the following would be your next best course of action?

(Please select 1 option)

- Manage him conservatively with physiotherapy
- Refer him to a neurosurgeon for urgent brain biopsy
- Refer him to a stroke specialist
- Request an HIV antibody test □ Correct
- Start thrombolysis treatment

This man was already infected with two blood-borne viruses (hepatitis B and C). His absolute lymphocyte count was low. CT scan showed multiple ring-enhanced lesions, which were suggestive of cerebral toxoplasmosis.

Therefore, testing HIV is the next best course of action. Finding multiple ring-enhanced lesions on CT scan needs further investigations.

Managing conservatively with physiotherapy is not an appropriate course of action.

CT scan is not typical of brain tumour, hence referring him for urgent brain biopsy is not the best course of action.
course of action.

Thrombolysis treatment should not be started, as the CT scan was not typical of ischaemic stroke.

Reference:

A 34-year-old Thai lady presented with a left hemiparesis of two weeks duration. HIV antibody test was positive. CT scan of the head showed multiple ring-enhanced lesions.

Which of the following is the most likely cause of her weakness?

(Please select 1 option)

- Amoebic brain abscesses
- Cerebral toxoplasmosis - Correct
- Herpes simplex encephalitis
- Primary brain lymphoma
- Progressive multifocal leucoencephalopathy

Cerebral toxoplasmosis is the most likely diagnosis. Multiple ring-enhanced lesions are commonly seen in patients with cerebral toxoplasmosis, though solitary ring enhanced lesions are seen in 25% of patients on CT scan. MRI scan is more sensitive in identifying small lesions than CT scan.

Amoebic brain abscesses are not the most likely cause in this patient.

Multiple ring-enhanced lesions are not seen in patients with herpes simplex encephalitis.

Primary brain lymphoma causes a significant mass effect with surrounding oedema.

Progressive multifocal leucoencephalopathy causes multifocal white matter lesions without any mass effect or surrounding oedema.
Reference:
Work Smart

Question 111 of 164

Which one of the following is an oncogenic virus?

(Please select 1 option)

- Hepatitis A
- Human papilloma virus 6 (HPV 6)
- Human papilloma virus 11 (HPV 11)
- Human papilloma virus 16 (HPV 16) - Correct
- Varicella zoster virus (VZV)

HPV 16 is oncogenic and causes squamous cell carcinomas in the oral cavity, cervix, anus and penis.

Hepatitis A is not an oncogenic virus, as it does not cause chronic infection or cancer.

HPV 6 and 11 typically cause the majority of benign warts.

VZV causes chicken pox and herpes zoster.

Reference:

A 28-year-old man with HIV presents with a five-day history of feeling unwell. He is a heavy smoker. A chest radiograph showed right upper lobe consolidation. His CD4 count was 468 cells/mm$^3$. HIV RNA level was 90,678 copies/ml. He is not on any antiretroviral treatment.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Bronchial carcinoma
- Invasive pulmonary aspergillosis
- Pulmonary tuberculosis
- *Pneumocystis jiroveci* pneumonia (PCP)
- Streptococcal pneumonia

This is typical of community-acquired pneumonia. One should think of common infections rather than any opportunistic infections in HIV patients with good CD4 counts. (More than 400 cells/mm$^3$ is not immunocompromised.)

It is not a typical history for bronchial carcinoma as the history was short and radiographic changes were not typical of bronchial carcinoma.

Invasive pulmonary aspergillosis is unlikely in a patient with good CD4 count.

Pulmonary tuberculosis typically causes cavitating lesions in a patient with a good CD4 count.
PCP commonly occurs in patients with CD4 count of less than 200 cells/mm$^3$ and chest radiograph shows bilateral infiltrates from the hila without any effusion or lymphadenopathy.

The history is too short for tuberculosis, and apart from HIV there aren't any other risk factors for this.
A 31-year-old African man presented with a history of fever, night sweats, shortness of breath, and weight loss for two months.

His chest radiograph showed a moderately severe, left pleural effusion only. He consented to an HIV test which was positive.

Which is the most likely cause of pleural effusion?

(Please select 1 option)

- Hodgkin's lymphoma
- Pleural tuberculosis  □ Correct
- Pneumocystis jirovecii pneumonia (PCP)
- Pulmonary aspergillosis
- Pulmonary Kaposi's sarcoma

Pleural tuberculosis is the most likely cause in an HIV-positive African man with a two-month history of weight loss. His pleural effusion is due to pleural tuberculosis (extrapulmonary tuberculosis).

Hodgkin's lymphoma can cause pleural effusion due to pleural involvement but it is often associated with mediastinal mass. His chest radiograph showed only pleural effusion. Non-Hodgkin's lymphoma (not Hodgkin's lymphoma) is commonly associated with these patients.

PCP does not cause pleural effusion. It typically causes bilateral reticular shadows from the hila without any hilar lymph node enlargement or pleural effusion.
Pulmonary aspergillosis shows infiltrative lesions but it does not typically cause pleural effusion.
Pulmonary Kaposi's sarcoma can cause pleural effusion by involving the pleura, but it often causes coarse irregular nodular lesions in the lungs.

Reference:
Work Smart

Question 114 of 164

Which one of the following is an AIDS defining illness?

(Please select 1 option)

- Anal canal warts
- Extra genital molluscum contagiosum
- Multidermatomal shingles
- Oesophageal candidiasis
- Oral candidiasis

Any opportunistic infections or opportunistic malignancies are AIDS-defining illnesses.

Oesophageal candidiasis is an AIDS-defining illness but oral candidiasis is not.

Anal warts are not an opportunistic infection.

Extragenital molluscum contagiosum is also not an opportunistic infection but frequently occurs in symptomatic HIV-positive patients.

Multidermatomal shingles is not an opportunistic infection but if it occurs in a young person HIV infection needs to be excluded.

Go to summary
Question 115 of 164

Which one of the following cutaneous lesions is associated with HIV infection?

(Please select 1 option)

- Leucoplakia
- Lichen planus
- Lichen sclerosus
- Plasma cell balanitis
- Psoriasis  Correct

It occurs in 2-4% of healthy people. If pre-existing psoriasis flares up for no apparent reason or middle-aged people develop psoriasis for the first time, one should exclude underlying HIV infection in those patients.

Leucoplakia is a pre-cancerous lesion whereas oral hairy leucoplakia is a sign of immunodeficiency in an HIV-positive patient.

Lichen planus, lichen sclerosus and plasma cell balanitis are not associated with HIV infection.
A 36-year-old Caucasian woman was successfully treated for *Pneumocystis jirovecii* pneumonia (PCP).

She was re-admitted with acute breathlessness with left-sided chest pain ten days after her discharge from the hospital. Examination revealed that she was hypoxic and found to have diminished breath sounds on the left side of chest.

What is the most likely cause of her recent admission?

(Please select 1 option)

- Acute myocardial infarction
- Acute pericarditis
- Acute pulmonary embolism
- Left lobar pneumonia
- Pneumothorax □ Correct

Pneumothorax is a well-known complication of PCP. An acute history of chest pain with breathlessness and diminished breath sounds is typical of pneumothorax.

Diminished breath sounds are not a feature of acute myocardial infarction or acute pericarditis.

Acute pulmonary embolism should be considered due to her recent admission but diminished breath sounds are not a feature.

There are no signs of consolidation to consider lobar pneumonia.
Work Smart

Question 117 of 164

Which one of the following drugs is associated with hypersensitivity reactions?

(Please select 1 option)

- Atazanavir
- Lamivudine
- Nevirapine  This is the correct answer
- Tenofovir
- Zidovudine  Incorrect answer selected

Nevirapine can cause acute hepatitis and skin rash as a part of hypersensitive reaction especially when the CD4 count is over 250 cells/ml in women and over 400 cells/ml in men. Nevirapine should not be prescribed in those conditions.

Atazanavir causes hyperbilirubinaemia and rarely renal stones.

Lamivudine does not cause hypersensitivity reaction.

Tenofovir causes proximal tubular damage.

Zidovudine causes bone marrow suppression.

Reference:

A 27-year-old man presents with pulmonary tuberculosis. He was released from a Chinese jail where he was a prisoner for some six years and has now applied for residency in the United Kingdom.

On examination, you notice that he has a number of violaceous plaques on both lower limbs. Oral candidiasis is also present.

Investigations show:

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<tr>
<th>Test</th>
<th>Result</th>
<th>Normal Range</th>
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<tbody>
<tr>
<td>Haemoglobin</td>
<td>114 g/L</td>
<td>(135-180)</td>
</tr>
<tr>
<td>White cell count</td>
<td>$4.2 \times 10^9$/L</td>
<td>(4-10)</td>
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<tr>
<td>Platelets</td>
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<td>Sodium</td>
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<td>(134-143)</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.2 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>120 µmol/L</td>
<td>(60-120)</td>
</tr>
</tbody>
</table>

Which of the following is the most likely cause of his skin changes?

(Please select 1 option)

- [ ] Coxsackie B
- [ ] Herpes zoster
- [ ] Human herpes virus 6
- [ ] Human herpes virus 8 **Correct**
The skin condition that this patient is suffering from is suggestive of Kaposi's sarcoma in a patient with HIV infection (pulmonary tuberculosis and oral candidiasis).

HHV-8 DNA was first sequenced from Kaposi's in the early '90s. Human herpes virus 8 is also associated with primary effusion lymphoma (a rare lymphoma of serous cavities) and Castleman's disease.

AIDS-related Kaposi's sarcoma becomes smaller as immune function improves such as with treatment with highly active antiretroviral therapy (HAART).

In some circumstances, chemotherapy may be added to HAART. Radiotherapy may be used to treat painful or highly visible lesions.
A 67-year-old man is referred with symptoms of fatigue and a low-grade fever. He has lost a few pounds in weight over the past few weeks and suffered from persistent night sweats.

Past history of note includes chronic gum disease and a number of broken teeth. He is also allergic to penicillin.

On examination, he has a temperature of 37.8°C, and his BP is 105/70 mmHg with a pulse of 95. There are splinter haemorrhages on examination of the fingers on both hands. He has a systolic murmur loudest in the mitral area.

Investigations show:

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<td>White cell count</td>
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<td>(4-10)</td>
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<tr>
<td>Platelets</td>
<td>$201 \times 10^9$/L</td>
<td>(150-400)</td>
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<tr>
<td>Sodium</td>
<td>139 mmol/L</td>
<td>(134-143)</td>
</tr>
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<td>Potassium</td>
<td>4.5 mmol/L</td>
<td>(3.5-5)</td>
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<td>Creatinine</td>
<td>135 μmol/L</td>
<td>(60-120)</td>
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<tr>
<td>C-reactive protein</td>
<td>125 mg/L</td>
<td>(&lt;10)</td>
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</tbody>
</table>

Which of the following is the most appropriate empirical antibiotic regime?

(Please select 1 option)

- Benzylpenicillin and gentamicin
- Ceftazidime and metronidazole
Viridans or *Bovis streptococci* would figure very high on the index of suspicion, as causes of endocarditis here. As such, in the presence of penicillin allergy, guidelines from the Royal College recommend vancomycin and gentamicin combination therapy as the best alternative to benzylpenicillin and gentamicin.

Flucloxacillin and gentamicin is the regime of choice for methicillin-sensitive *Staphylococcus aureus*, with linezolid an appropriate alternative in MRSA.
Work Smart

Question 46 of 50

A 24-year-old IV drug abuser presents with jaw spasm to the Emergency Department. She says she re-used a heroin needle a few days ago and a couple of her sites look infected.

She has suffered recurrent admissions with pneumonia over the past two years and has been using heroin for the past four years.

On examination, she is pyrexial 37.8°C. She has jaw spasm, significant neck stiffness and looks in pain. Examination of her groin and left antecubital fossa reveals discharging sinuses from where she has injected heroin previously.

Investigations show:

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<td>(135-180)</td>
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<td>WCC</td>
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<td>PLT</td>
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<td>Na</td>
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<td>K</td>
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<td>Cr</td>
<td>129 μmol/L</td>
<td>(60-120)</td>
</tr>
</tbody>
</table>

She is given immunoglobulin.

Which of the following antibiotic treatments is most appropriate in addition?

(Please select 1 option)

- Chloramphenicol
This woman is suffering from tetanus as a result of infection via a contaminated drug injecting needle.

Initial management of choice is anti-tetanus immunoglobulin, followed in this case by the addition of systemic antibiotics, either metronidazole or benzylpenicillin, and debridement of any wound if required.

Diazepam, neuromuscular blockade, and intubation may all be required during the acute phase.

Over the longer term, muscle spasms and ankle clonus can persist for many months.
You are asked to be part of a team reviewing the passengers on a cruise ship. Over the course of the past four days there has been a massive increase in cases of diarrhoea and vomiting and the ship has returned to port.

Currently, over 300 passengers are estimated to be unwell. Apparently, a number of passengers ate at the speciality seafood restaurant or are sharing cabins with passengers who did. Out of 10 passengers admitted to the local hospital so far, all of them showed signs of dehydration, but no signs of raised white cell count.

Which of the following is the most likely infective agent?

(Please select 1 option)

- Campylobacter
- Norovirus - This is the correct answer
- Rotavirus
- Salmonella - Incorrect answer selected
- Shigella

Three factors stand out:

1. The rapid spread of diarrhoea and vomiting
2. The fact that most of the passengers had eaten in the ship's seafood restaurant
3. Patients admitted to the hospital so far show no signs of neutrophilia, but do show signs of
Norovirus is concentrated in shellfish, small oysters and plankton, and person to person spread can occur from aerosols of projectile vomit or faecal material.

Rotavirus, in contrast, occurs more frequently in and is more severe in the paediatric population.

Answer Statistics

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<th>Percentage</th>
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<td>3%</td>
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Times answered: 5933

Test Analysis

Correct | Incorrect | Partially Correct
---------|-----------|-------------------
Correct  |           |                   

Score: 55.46%
Total Answered: 119
A 27-year-old man comes to the Emergency Department with his partner at 5 am. He has developed torrential diarrhoea a few hours after eating a Chinese takeaway with fried rice. Apparently, he bought the meal at the beginning of the evening when he thought it would be most fresh.

On examination he is dehydrated with a BP of 110/70 mmHg, a pulse of 90 and a significant postural drop.

Investigations show:

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<tr>
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<th>Value</th>
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<td>White cell count</td>
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<tr>
<td>Platelets</td>
<td>292 ×10^9/L</td>
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<td>Serum sodium</td>
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<td>Serum potassium</td>
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<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>122 μmol/L</td>
<td>(79-118)</td>
</tr>
</tbody>
</table>

Which of the following is the most likely cause of his gastroenteritis?

(Please select 1 option)

- Bacillus cereus  □ Correct
- Norovirus
- Rotavirus
- Staphylococcus aureus
Bacillus cereus food poisoning occurs around six to eight hours after ingestion of reheated rice. Two distinct forms occur, one related to a toxin which leads to profuse vomiting, the other which leads to torrential diarrhoea.

It is likely the takeaway restaurant reheated rice that was left over from the previous evening.

The condition is self-limiting and usually resolves within 24 hours. No specific intervention is required, and this patient should just be given oral rehydration salts.
Work Smart

Question 121 of 164

A 19-year-old gap year student presents to the GP feeling unwell with fevers, lethargy, right upper quadrant pain, a dry cough and shortness of breath over the past few days. She has returned from an Operation Raleigh assignment in Uganda a few weeks ago.

Her only past medical history of note is that she reports an itchy area of skin on her upper thigh shortly after swimming in a local lake. Examination is unremarkable apart from some right upper quadrant tenderness.

Investigations show:

<table>
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<tr>
<th>Investigation</th>
<th>Value</th>
<th>Reference Range</th>
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<td>White cell count</td>
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<td>(4-11)</td>
</tr>
<tr>
<td></td>
<td>Raised eosinophils</td>
<td>-</td>
</tr>
<tr>
<td>Platelets</td>
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<td>Potassium</td>
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</tr>
<tr>
<td>Creatinine</td>
<td>110 μmol/L</td>
<td>(79-118)</td>
</tr>
</tbody>
</table>

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Churg-Strauss syndrome
- Extrinsic allergic asthma
The initial area of itching may be related to swimmers’ itch, which is related to the entry of the parasite through the skin after swimming in an area where the parasite is present in water.

The raised eosinophil count supports the diagnosis, and the dry cough raises the possibility of parasitic migration to the lungs. Diagnosis is based upon the presence of parasites in the stool, or in the urine in the case of *S. haematobium*.

Praziquantel is the treatment of choice, given as a single dose with follow-up in four to six weeks.
A 72-year-old woman presents to her GP a few days after discharge from hospital after a community acquired pneumonia with some cellulitis around an old IV site on her left hand.

On examination, she is pyrexial at 37.6°C and has a 5 cm × 3 cm area of erythema and some discharging pus from the entry site of the needle.

Investigations show:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Normal Range</th>
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<tbody>
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<td>Haemoglobin</td>
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<tr>
<td>White cell count</td>
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<td>(4-11)</td>
</tr>
<tr>
<td>Platelets</td>
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<tr>
<td>Sodium</td>
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</tr>
<tr>
<td>Potassium</td>
<td>4.3 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>110 μmol/L</td>
<td>(79-118)</td>
</tr>
<tr>
<td>Swab from cellulitis site</td>
<td>MRSA</td>
<td></td>
</tr>
</tbody>
</table>

Which of the following is the most appropriate empirical antibiotic for her whilst awaiting sensitivities?

(Please select 1 option)

- Co-trimoxazole
- Doxycycline [This is the correct answer]
- Flucloxacillin [Incorrect answer selected]
This woman has an area of methicillin-resistant *Staphylococcus aureus* (MRSA) cellulitis on her hand which is likely to respond to oral antibiotic therapy; her white count and temperature are only mildly elevated.

As with all infections, antibiotic treatment should ultimately be guided by proven sensitivities and known sensitivities of local strains. In practice, you should, therefore, discuss such results with your local microbiologists.

However, recent profiling of MRSA strains in England and Wales suggested all were sensitive to clindamycin, trimethoprim, vancomycin, linezolid and mupirocin.

Current guidelines recommend community treatment for uncomplicated MRSA skin and soft tissue infections should be oral doxycycline (if >12 years) 100 mg BD or fusidic acid 500 mg TDS or trimethoprim 200 mg BD combined with rifampicin 300 mg BD. Oral linezolid 600 mg BD is an alternative use, but due to its high cost, it is generally reserved for secondary care and in patients who cannot tolerate other options.

For more severe infections, either IV vancomycin or linezolid may be an appropriate option but you would take microbiology advice. Oral vancomycin is not absorbed systemically and therefore is generally only used for *C. difficile* infection.

Reference:

A 32-year-old woman comes to the clinic. She complains of very foul smelling diarrhoea, abdominal bloating and excessive flatulence some two weeks after returning from a holiday to Mauritius with her husband. They admit to having eaten food from street vendors on a number of occasions during the course of the holiday.

On examination her BP is 122/72 mmHg, there is no postural drop. Her pulse is 70 and regular. Respiratory examination is normal and abdominal examination reveals a soft but mildly distended abdomen, with active bowel sounds.

Investigations show:

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>118 g/L</td>
<td>(115-165)</td>
</tr>
<tr>
<td>White cells</td>
<td>$8.9 \times 10^9$/L</td>
<td>(4-11)</td>
</tr>
<tr>
<td>Platelets</td>
<td>$192 \times 10^9$/L</td>
<td>(150-400)</td>
</tr>
<tr>
<td>Sodium</td>
<td>140 mmol/L</td>
<td>(135-146)</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.0 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>110 $\mu$mol/L</td>
<td>(79-118)</td>
</tr>
<tr>
<td>Albumin</td>
<td>40 g/L</td>
<td>(35-50)</td>
</tr>
</tbody>
</table>

Which of the following is the most likely diagnosis?

(Please select 1 option)

- [ ] Campylobacter
- [x] Giardiasis  Correct
This patient's history is consistent with *Giardia lamblia* infection, particularly with respect to her abdominal bloating, diarrhoea, and excess production of gas. It is transmitted via the faecal oral route, and she is likely to have picked up the infection from eating food from a street vendor.

Diagnosis was traditionally based on stool microscopy looking for trophozoites or cysts, but antigen tests are now also available. The infection responds to treatment with either metronidazole or tinidazole, and once treated does not usually recur.

Campylobacter usually has a shorter clinical course, with an incubation period which is typically 2 to 5 days. There is a prodromal illness of fever and myalgia which typically lasts for up to 24 hours. Predominant clinical symptoms are watery stool, which is often bloody and profuse (up to 10 stools per day). Pain is a predominant feature, and patients are often more unwell than described here.

Salmonella has a much shorter clinical course than described here, with recovery usually seen within 4 to 7 days. Diarrhoea, which can be bloody, is often associated with fever and abdominal cramps.

Shigella is also typically a more self-limited disease than described here, with symptoms having usually resolved within 3 to 7 days. Diarrhoea is watery, and may be accompanied by mucus, pus or blood.

Tropical sprue is typically a more chronic condition than is described here. It consists of diarrhoea, malabsorption and weight loss. It classically occurs in residents of South East Asia and the Caribbean and affects visitors more rarely. It is presumed to have an infective cause, but this remains unclear. The clinical picture is variable. Patients are often deficient in iron, folate, vitamins B12, A, D, K and calcium. Jejunal biopsy shows incomplete villous atrophy.
A 16-year-old boy is to be admitted to the hospital for elective splenectomy.

Which of the following booking times before surgery should he be given to receive his pneumococcal vaccination?

(Please select 1 option)

- Three days
- One week □ Incorrect answer selected
- Four weeks □ This is the correct answer
- Two months
- Three months

Patients should be vaccinated with an appropriate pneumococcal vaccination at least two weeks prior to surgery to allow the maximal humoral immune response. If they have not received the *Haemophilus influenzae* or meningococcal vaccinations, then they should also receive these.

In cases of emergency splenectomy related to trauma, patients should be vaccinated as early as possible after surgery. Patients who have undergone splenectomy are at significantly increased risk of infection from all three of these bacteria without vaccination.

They should also be enrolled in the yearly seasonal flu vaccination programme post splenectomy.

Reference:

Davies JM, et al. [Update of guidelines for the prevention and treatment of infection in patients with an](http://example.com)

Test Analysis

Correct Incorrect Partially
Correct

Score: 54.84%
Total Answered: 124
Work Smart

Question 125 of 164

A 22-year-old student presents to the clinic complaining of a large crop of intensely painful blisters/ulcers and tingling pain affecting her vulva. She gives a history of unprotected sex on two occasions in the past two weeks, with a new partner who she met at a party.

She feels under the weather, is experiencing dysuria and has noticed vaginal discharge.

On examination, you notice a number of small blisters/ulcers over her vulva and tender inguinal lymph nodes.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Behçet's syndrome
- Chancroid
- Genital herpes simplex - Correct
- Genital herpes zoster
- Syphilis

The answer is genital herpes simplex.

The history of a mild constitutional illness coupled with painful and blistering genital ulceration and neuropathic type pain fits best with herpes simplex infection. Viral swabs for PCR are used for confirming the diagnosis, and the patient should be started on an appropriate oral anti-viral such as aciclovir.
It is also mandatory that they undergo a full sexual health screen at the local genitourinary medicine clinic to exclude co-infection with another sexually transmitted disease.

Topical anti-virals have no value in the management of the condition. The ulcers of syphilis, a differential here, are usually painless.
A 21-year-old man returns from a trip to Spain with a group of male friends, complaining of pus-like urethral discharge and pain on passing urine. He admits to unprotected sex with three different female partners during the course of the holiday.

On examination he is apyrexial, his BP is 115/70 mmHg, and his pulse is 70 and regular. Respiratory and abdominal examinations are unremarkable.

You can easily express pus-like discharge from his urethral meatus.

Investigations show:

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>139 g/L</td>
<td>(135-177)</td>
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<tr>
<td>White cell count</td>
<td>9.6 ×10⁹/L</td>
<td>(4-11)</td>
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<tr>
<td>Platelets</td>
<td>282 ×10⁹/L</td>
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<td>Serum sodium</td>
<td>139 mmol/L</td>
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</tr>
<tr>
<td>Serum potassium</td>
<td>4.4 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>88 µmol/L</td>
<td>(79-118)</td>
</tr>
<tr>
<td>Microscopy of pus sample</td>
<td>Gram negative diplococci</td>
<td></td>
</tr>
</tbody>
</table>

Which of the following is the most appropriate treatment for him?

(Please select 1 option)

- Ceftriaxone 500 mg IM STAT & azithromycin 1 g PO STAT  □ Correct
- Ciprofloxacin 500 mg BD for 7 days
This gentleman has gonorrhoea, for which the correct treatment is ceftriaxone 500 mg intramuscularly as a single dose with azithromycin 1 g oral as a single dose.

Due to questions of compliance and the need for definitive treatment, the optimal way to deliver treatment for gonorrhoea is with one off treatment. Resistance is becoming an increasing problem in the treatment of gonorrhoea worldwide.

This patient will also require referral to the local GUM clinic for a full sexual health screen to rule out co-existent pathogens apart from gonococcus.
A 42-year-old single man comes to the clinic some two weeks after a tour to Thailand. During his trip, he admits to unprotected sex with a number of prostitutes. Since his return, he has been suffering fevers and night sweats over the past few days and has noticed some swollen lymph nodes in his neck, armpits and groin. He has also felt nauseated and been off his food.

On examination, you confirm that he has a low-grade fever of 37.6°C and lymphadenopathy. He also has pharyngitis.

Investigations:

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>129 g/L</td>
<td>(135-177)</td>
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<tr>
<td>White cell count</td>
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<tr>
<td>Platelets</td>
<td>272 ×10⁹/L</td>
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</tr>
<tr>
<td>Serum sodium</td>
<td>138 mmol/L</td>
<td>(135-146)</td>
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<tr>
<td>Serum potassium</td>
<td>4.0 mmol/L</td>
<td>(3.5-5)</td>
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<tr>
<td>Creatinine</td>
<td>80 µmol/L</td>
<td>(79-118)</td>
</tr>
<tr>
<td>Alanine aminotransferase</td>
<td>129 U/L</td>
<td>(5-40)</td>
</tr>
</tbody>
</table>

You are wondering about acute HIV infection.

Which of the following would be an appropriate test to detect this?

(Please select 1 option)

- Anti-HIV antibody by ELISA
- Incorrect answer selected
The answer is P24 antigen.

The concern here is that testing would be too soon to detect antibodies to HIV in the serum. As such P24 antigen testing may detect HIV infection one to three weeks after the event and is the most appropriate option here.

The alternative is HIV RNA testing to estimate viral load.

HIV antibody testing by western blot has a lower false positive rate than HIV antibody by ELISA and may be an option when a false positive result is suspected.

CD4 counts begin to reduce later in HIV infection.
Work Smart

Question 128 of 164

A 44-year-old man is brought to the hospital by his boyfriend.

Over the past few weeks, he has complained of increasing headaches and nocturnal fevers. His boyfriend is now concerned that over the weekend he has taken to his bed and has become drowsy and confused.

On examination, his temperature is 37.8°C and BP 150/90 mmHg. He has papilloedema and neck stiffness. He refuses to comply with most of the elements of neurological testing.

Investigations show:

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<tr>
<th>Test</th>
<th>Result</th>
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<tbody>
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<tr>
<td>Serum potassium</td>
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</tr>
<tr>
<td>Creatinine</td>
<td>111 µmol/L</td>
<td>(79-118)</td>
</tr>
<tr>
<td>Glucose</td>
<td>6.7 mmol/L (non-fasting)</td>
<td></td>
</tr>
<tr>
<td>CSF Opening Pressure</td>
<td>220 mm H₂O</td>
<td>(50-180)</td>
</tr>
<tr>
<td>CSF Glucose</td>
<td>6.5 mmol/L</td>
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</tr>
<tr>
<td>India Ink Test</td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td>CT scan</td>
<td>small ventricles but otherwise unremarkable</td>
<td></td>
</tr>
</tbody>
</table>
Which of the following is the most likely diagnosis?

(Please select 1 option)

- Cryptococcal meningitis  □ Correct
- HIV dementia
- HIV encephalopathy
- Meningococcal meningitis
- Tuberculous meningitis

The answer is cryptococcal meningitis on a background of HIV infection.

The insidious onset seen here, coupled with signs of raised intracranial pressure, normal glucose on CSF sampling and positive India ink test are all strong pointers to the diagnosis of cryptococcal meningitis. India ink smears, however, are less sensitive and specific than CSF cryptococcal antigen test, which has a sensitivity of greater than 95%, but false negative tests can occur with a low organism burden.

MRI scanning is more sensitive than CT and may show low-intensity lesions in the basal ganglia which enhance with gadolinium.

Treatment, in this case, would be with amphotericin B combined with flucytosine, although good results have also been seen with flucytosine and fluconazole combination therapy.

Despite aggressive intervention, however, mortality is still high at around 6%.

Answer Statistics

<table>
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<td>5</td>
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</tr>
</tbody>
</table>
A 36-year-old single woman with a history of asthma comes to the clinic complaining of symptoms of indigestion.

She uses a steroid inhaler and on examination of her oropharynx, you can see obvious evidence of candidiasis. You send her for an endoscopy, which unfortunately reveals extensive oesophageal candidiasis.

Which of the following tests would be most important to consider in this patient?

(Please select 1 option)

- CD4 count
- Complement testing
- Fasting blood glucose
- HIV antibody testing - Correct
- Immunoglobulin testing

The answer is HIV antibody testing.

Whilst candidiasis affecting the oropharynx may be a result of poor inhaler technique and deposition of steroid powder within the mouth, it does not usually result in oesophageal candidiasis.

The other possible cause of recurrent oral and genital candida infection is diabetes mellitus, although again this would not normally lead to oesophageal disease.

In the case of this patient, immunocompromise should be suspected and HIV considered,
appropriate pre-test counselling.

Answer Statistics

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
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<td>3</td>
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<td>5</td>
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Times answered: 5731

Test Analysis

<table>
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<tr>
<th>Correct</th>
<th>Incorrect</th>
<th>Partially</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Correct</td>
</tr>
</tbody>
</table>

Score: 55.81%

Total Answered: 129

Feedback
A 28-year-old woman comes to the clinic complaining of a thin fishy smelling discharge. She does not however have any vaginal irritation, redness or itching. Despite using body wash and showering twice per day, she says the smell and discharge persists. She is in a stable relationship with her husband and has two young children.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Bacterial vaginosis  □ Correct
- C. trachomatis
- Herpes simplex infection
- N. gonorrhoeae
- T. vaginalis

The answer is bacterial vaginosis.

This woman is in a stable relationship, with a history of excess body washing, the history of clear discharge without irritation fits best with bacterial vaginosis. It typically features a reduction in the number of the normal hydrogen peroxide-producing Lactobacilli in the vagina.

Simple measures such as reducing the use of body wash and considering using a lactic acid preparation to restore her natural vaginal flora will often reduce symptoms.

A course of oral metronidazole for five - seven days will further reduce discharge and odour.
In pregnancy, bacterial vaginosis may increase the risk of miscarriage.
A 32-year-old woman complains of an offensive clear yellow vaginal discharge, with associated vulval itch and soreness. She admits to beginning a relationship with a new partner some four weeks earlier. On examination her vulva looks slightly erythematous and there is a clear discharge that has a fishy odour.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Bacterial vaginosis
- *C. trachomatis* □ Incorrect answer selected
- Herpes simplex infection
- *N. gonorrhoeae*
- *T. vaginalis* □ This is the correct answer

The answer is *T. vaginalis*.

The clinical picture described fits entirely with infection with the anaerobic flagellated protozoan *Trichomonas vaginalis*.

Trichomoniasis differs from non-infective vaginosis, with respect to a yellowish colour to the discharge and associated vulval irritation.

A large dose of metronidazole (2 g as a single course), or a seven day course at lower dose is the treatment of choice. Patients should of course also be screened for other sexually transmitted
infections.

Partners should be identified and also screened for infection as men rarely exhibit symptoms of a *T. vaginalis* infection.

The epithelial damage caused by *T. vaginalis* increases susceptibility to HIV virus infection and transmission.

Whilst bacterial vaginosis is also associated with a discharge with a fishy odour, classically there is no soreness or irritation associated with it.
Question 132 of 164

A 29-year-old junior doctor comes to the Emergency Department complaining of a severe headache and neck stiffness. He has had mild diarrhoea over the past few days and some coryzal symptoms.

On examination his BP is 155/82 mmHg, his pulse is 85 and regular and his temperature is 37.8°C. He has signs consistent with severe meningism but there are no skin rashes or other signs of vasculitis.

Investigations show:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>138 g/L</td>
<td>(135-177)</td>
</tr>
<tr>
<td>White cells</td>
<td>8.9 ×10^9/L</td>
<td>(4-11)</td>
</tr>
<tr>
<td>Platelet</td>
<td>183 ×10^9/L</td>
<td>(150-400)</td>
</tr>
<tr>
<td>Sodium</td>
<td>141 mmol/L</td>
<td>(135-146)</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.4 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>92 µmol/L</td>
<td>(79-118)</td>
</tr>
</tbody>
</table>

Lumbar puncture - lymphocytosis, slightly raised protein, normal glucose.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Cytomegalovirus meningitis
- Enterovirus meningitis  □ Correct
- Herpes simplex encephalitis
The answer is *Enterovirus* meningitis.

*Enterovirus* is the commonest cause of viral meningitis in the adult population.

The corizal symptoms coupled with a mild diarrhoeal illness fit with this picture, as do the lumbar puncture findings.

Management of viral meningitis is conservative, with adequate hydration and analgesia.
A 75-year-old lady is brought to the Emergency Department by her next of kin after a three-week history of having "gone off her feet".

A history of back pain radiating anteriorly around her chest and bilateral weakness of her legs is elicited. Physical examination shows a paraparesis.

Blood investigations are notable for haemoglobin of 95 g/L, serum calcium of 3.6 mmol/L and a creatinine of 250 µmol/L.

Which of the following would be the most appropriate initial investigation?

(Please select 1 option)

- Bone marrow biopsy
- Serum protein electrophoresis, quantitative immunoglobulins and serum free light chains
- CT chest, abdomen, pelvis
- Urgent magnetic resonance imaging of her spine
- Urine for creatinine clearance and Bence Jones protein

The combination of hypercalcaemia, anaemia and renal failure in a patient presenting with spinal cord compression should lead you to consider a diagnosis of multiple myeloma.

Multiple myeloma is a plasma cell disorder with a malignant clone producing a monoclonal paraprotein. Clinical manifestations relate both to substances secreted by the plasma cells and
effects of marrow infiltration. Complications include pathological fractures, hyperviscosity syndrome, hypercalcaemia, renal impairment, bone pain, and recurrent infections. Spinal cord compression can develop due to vertebral compression fractures or vertebral plasmacytomas.

An urgent MRI of the spine is indicated to determine whether spinal cord compression is present in view of this patient's neurology. Bone marrow biopsy, serum protein electrophoresis, quantitative immunoglobulins and serum free light chains and urine for creatinine clearance and Bence Jones protein should all be done following this to determine if myeloma is the underlying diagnosis, and to help guide further treatment. CT can be used to lineate the extent of disease but is not a first line investigation for myeloma or spinal cord compression.

It is also important to realise that this level of hypercalcaemia is potentially life-threatening, with risk of arrhythmia or coma. Immediate treatment is with intravenous hydration (rapidly) followed by intravenous bisphosphonate.
Question 134 of 164

A 10-year-old boy is noticed to be jaundiced on return from a holiday in Africa with his parents. He is on antimalarial prophylaxis.

His complete blood count shows haemoglobin of 80 g/L, with Heinz bodies and blister cells on blood film examination.

Which of the following relates to this disorder?

(Please select 1 option)

1. It is most commonly precipitated by peas - Incorrect answer selected
2. The antimalarial prophylaxis has no relation to the laboratory findings
3. This is a common autosomal dominant disorder
4. Transfusion is strictly merited in each case
5. Treatment involves strict avoidance of known precipitants - This is the correct answer

This question relates to the management of G-6-PD deficiency.

G-6-PD is the most common inherited enzyme defect in humans; an X-linked inheritance pattern.

It is mostly commonly precipitated by several classes of drugs, including antimalarials and is also associated with ingestion of broad beans (favism).

Treatment revolves around avoidance of all known precipitating factors, and blood product support should only be given in unstable, symptomatic patients.
A 25-year-old male presents with fever, malaise, and lethargy two weeks after visiting family in India. A blood film for malaria parasites is reported as negative.

What is the next most appropriate investigation?

(Please select 1 option)

- Blood culture  
  - This is the correct answer
- Chest x ray
- Interferon gamma releasing assay (IGRA)  
  - Incorrect answer selected
- Urine culture
- Widal test

After malaria, enteric fevers are important to exclude.

Blood cultures are the most important investigation for enteric fevers caused by *Salmonella typhi* or *S. paratyphi*.

The Widal test, a demonstration of agglutinating antibodies against somatic O and flagella H antigen of *Salmonella* species is non-specific and, therefore, less reliable.
A 25-year-old female recently returned from Nigeria, presents to the Emergency Department with a two-day history of fever and rigors. Subsequently she develops a seizure. What is the next most appropriate immediate investigation?

(Please select 1 option)

- Blood culture
- Blood film for malarial parasites □ This is the correct answer
- CT scan of head □ Incorrect answer selected
- Lumbar puncture
- MR scan of head

With a recent history of travel to Nigeria, cerebral malaria caused by *P. falciparum* should be considered as a likely cause of her symptoms.

Therefore, a malaria blood film should be performed.

Other investigations may be required but investigations for malaria should be performed immediately.
A 72-year-old male presents with a two-month history of poor appetite, lethargy, intermittent fever and night sweats. Four months previously he had undergone TURP for benign prostatic hypertrophy.

On examination, a murmur consistent with mitral regurgitation is heard. A transthoracic echocardiogram reveals a vegetation on the mitral valve.

What is the likeliest cause of his endocarditis?

(Please select 1 option)

- C. burnetii
- E. faecalis  This is the correct answer
- MRSA
- S. aureus
- S. mutans  Incorrect answer selected

E. faecalis is a common cause of bacterial endocarditis following a urological procedure.

Urological procedures, such as transurethral resection of the prostate (TURP), may cause a transient E. faecalis bacteraemia.

In the presence of a pre-existing cardiac lesion, this may have caused infective endocarditis.
A 72-year-old female presents with a two-month history of poor appetite, lethargy, intermittent fever and night sweats. She has poor dentition and over the last 12 months has required dental extraction.

On examination, a murmur consistent with mitral regurgitation is heard. A transthoracic echocardiogram reveals a vegetation on the mitral valve.

What is the likeliest cause of her endocarditis?

(Please select 1 option)

- C. burnetii
- E. faecalis
- MRSA
- S. aureus
- S. mutans

S. mutans is a member of the streptococcus viridans group and a common cause of bacterial endocarditis.

Poor dentition and procedures such as dental extraction are associated with transient viridans streptococcal bacteraemia.

In the presence of a pre-existing cardiac lesion this may have caused infective endocarditis.
A sexually active female presents to a GU clinic with multiple painful genital ulcers.

What is the likeliest cause?

(Please select 1 option)

- **Chlamydia trachomatis**
- Correct
- Herpes simplex
- Haemophilus ducreyi
- Primary HIV infection
- Treponema pallidum

Herpes simplex is a sexually transmitted disease and the commonest cause of multiple painful genital lesions.

*C. trachomatis* and *T. pallidum* do not normally cause painful genital ulceration.

*H. ducreyi* does cause painful genital ulcers, however, there is usually only a single ulcer present and it is much less common than Herpes simplex in the United Kingdom. It remains highly prevalent in areas of Africa.

Compared to herpes simplex, primary human immunodeficiency virus (HIV) infection is an unusual cause of genital ulceration.
A 20-month-old baby is brought to the Emergency Department with a two-day history of irritability, fever and non-blanching rash. BP was normal.

What is the likeliest diagnosis?

(Please select 1 option)

- H. influenzae
- L. monocytogenes
- N. meningitidis  ☑ Correct
- S. aureus
- Streptococcus pneumoniae

Meningococcal disease is an important cause of severe infection in young infants. Early recognition and treatment is essential for a favourable outcome.

Although other organisms can cause meningitis, N. meningitidis is the likeliest cause.

At 20 months, the infant should have been immunised against H. influenzae serotype B.
A 27-year-old Somali female presents with a two-month history of weight loss, fever and night sweats.

Chest x ray reveals right upper lobe infiltrates. 3 x sputa are smear negative.

What is the next most appropriate investigation?

(Please select 1 option)

- Bronchoalveolar lavage (BAL)  [Correct]
- CT scan of chest
- HIV test
- Interferon gamma releasing assay (IGRA)
- Tuberculin skin test (TST)

The history, clinical presentation and radiological findings are highly suggestive of pulmonary TB.

BAL is more sensitive than sputum collection at detecting TB, either by smear or culture. In cases of suspected TB every effort should be made to confirm a suspected diagnosis by culture. Susceptibility testing is important as detection of resistance alters the combination of drugs and duration of treatment.
A 43-year-old Pakistani female presents with a two-month history of weight loss, fever and night sweats.

Chest x-ray reveals a large right sided pleural effusion.

What investigation is most likely to confirm a diagnosis of suspected TB?

(Please select 1 option)

- CT scan of thorax
- Interferon gamma releasing assay (IGRA)
- Pleural aspirate
- Pleural biopsy
- Sputum analysis

Pleural tuberculosis (TB) typically presents with pleurisy, pleuritic chest pain, cough, fever and a small to moderate unilateral pleural effusion.

Investigation should include a chest radiograph and sputum cultures initially. However, 50% of patients will have no radiographic evidence of parenchymal disease and only 20-30% of sputum cultures will be negative. Tuberculin skin tests can be falsely negative and are therefore not reliable. CT scan findings are non-specific, and interferon gamma releasing assays are positive in previous exposure to TB as well as active infection and are therefore non-specific.

Pleural fluid can be aspirated and should be sent for acid fast bacilli (AFB) smear and culture, cell
count and differential, protein, LDH, glucose and pH. This typically shows an exudative effusion that is lymphocyte-predominant and has a low glucose level. The adenosine deaminase level is often elevated, but rarely available to test in clinical practice. As the majority of these pleural fluid findings are non-specific, and AFBs are not reliably seen in every test, pleural fluid aspirate seldom confirms a diagnosis of TB.

The test most likely to confirm the diagnosis of TB is, therefore, a pleural biopsy. This allows microbiology, pathology and cytology investigation, and can obtain a TB isolate for susceptibility testing. Susceptibility testing is important as detection of resistance alters the combination of drugs and duration of treatment. The combination of AFB culture and histology (granulomas) from pleural biopsy is the most sensitive to diagnose pleural TB.
Work Smart

Question 143 of 164

A 35-year-old Nigerian female was assessed in an antenatal clinic. She was clinically well.

Antenatal screening for syphilis revealed the following results:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treponemal EIA total</td>
<td>Detected</td>
</tr>
<tr>
<td>Treponemal EIA IgM</td>
<td>Not detected</td>
</tr>
<tr>
<td>Treponemal TPPA</td>
<td>Detected 1:160</td>
</tr>
<tr>
<td>Treponemal RPR</td>
<td>Not detected</td>
</tr>
</tbody>
</table>

What is the likely diagnosis?

(Please select 1 option)

- Acute syphilis infection
- Early latent syphilis infection
- Late latent syphilis infection
- Non-specific reactivity
- Yaws

This is the correct answer

Non-specific reactivity

It is important that the serology is correctly interpreted and during pregnancy this lady is referred to a GU clinic for treatment with benzathine penicillin if not previously treated.

The detection of treponemal EIA total is confirmed by treponemal TPPA so this result is not a false
positive. As treponemal IgM is not detected this is not consistent with acute infection.

In the absence of symptoms, late latent infection is more likely than early latent infection.

These results are unlikely to be cross reactivity secondary to yaws.

Answer Statistics

<table>
<thead>
<tr>
<th></th>
<th>Correct</th>
<th>Incorrect</th>
<th>Partially</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td></td>
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<tr>
<td>3</td>
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<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Times answered: 6149

Test Analysis

- Correct: 66 question(s)
- Incorrect: 66 question(s)

Score: 53.85%

Total Answered: 143
Work Smart

Question 144 of 164

A 25-year-old male has a history of travel to South East Asia on holiday for two weeks.

Five weeks ago, three weeks after he returned from holiday, he developed fever, pharyngitis, myalgia and a skin rash. The patient also has a generalised lymphadenopathy.

There two Paul-Bunnell tests which are negative one week apart.

What is the most likely diagnosis?

(Please select 1 option)

- [ ] Acute HIV syndrome  □ Correct
- [ ] CMV mononucleosis
- [ ] Infectious mononucleosis
- [ ] Streptococcal pharyngitis
- [ ] Toxoplasmosis

The acute HIV syndrome very much resembles infectious mononucleosis. They have the same incubation period of three to six weeks. The signs and symptoms are the same. The Paul-Bunnell test is negative for acute HIV syndrome but positive for infectious mononucleosis.

With streptococcal pharyngitis the patient is more likely to have a sore throat, fever, chills, malaise and abdominal complaints. It has a short incubation period of one to four days. Both the Paul-Bunnell test and DNA polymerase chain reaction (PCR) for HIV will be negative.

Infectious mononucleosis has similar signs and symptoms to acute HIV syndrome but with a positive
Cytomegalovirus (CMV) mononucleosis has a longer incubation period of 20-60 days. The illness takes two to six days. There are fever, chills, profound fatigue, malaise and myalgia.

With toxoplasmosis, there are usually single or multiple enlarged cervical lymph nodes which are discrete, non-tender and vary in firmness.

The patient may also have:

- Fever
- Headache
- Malaise
- Fatigue
- Myalgia
- Sore throat
- Maculopapular rash
- Meningoencephalitis, and
- Confusion.

Cerebrospinal fluid (CSF) amplification DNA for toxoplasmosis gives the confirmatory diagnosis.
Work Smart

Question 145 of 164

A 35-year-old female who returned from holiday in Costa Rica two months ago now reports having ulceration around her neck with cervical lymphadenopathy.

The lesion was initially a papule then it turned into a nodule and is now an ulcer. The ulcer is pruritic with raised undulated borders. The thin smears of dermal scraping show amastigotes when stained with Giemsa.

What is the most likely aetiological agent?

(Please select 1 option)

- **Cutaneous leishmaniasis** - Correct
- Lepromatous leprosy
- *Mycobacterium tuberculosis* ulceration
- Visceral leishmaniasis
- Visceral ulceration

The history is typical of cutaneous leishmaniasis and the diagnosis is confirmed with the finding of amastigotes on a thin smear of dermal scrapings.

*Mycobacterium tuberculosis* ulceration usually has undermined edges. They will not have any amastigotes in stain.

Visceral ulceration is the wrong answer.

Visceral leishmaniasis is the wrong answer as it presents differently. The patient's skin may turn grey
with hepatosplenomegaly and some may have a lymphadenopathy.

Lepromatous leprosy usually forms poorly marginated, multiple infiltrated nodules and plaques of diffuse infiltration.
A 29-year-old man from Southampton with human immunodeficiency virus (HIV) infection (CD4 cell count 150 cells/mm$^3$) is admitted to hospital with a 10-day history of fever (temperature 38.8°C), a dry cough, weight loss and night sweats.

There is a history of previous tuberculosis. His current medications include TDF/3TC/EFV and inhaled pentamidine.


Initial results of his induced sputum examination demonstrate no organisms seen on Gram, fungal, acid-fast and *Pneumocystis jiroveci* pneumonia staining.

Which regimen would be most effective against the likely cause of this man's symptoms?

(Please select 1 option)

- **Clarithromycin and Amoxil**
- **Ganciclovir**
- **Isoniazid, rifampin, ethambutol and pyrazinamide**
- **Itraconazole**
- **Trimethoprim-sulfamethoxazole**

The clinical presentation of the said patient is compatible with *Pneumocystis jiroveci* pneumonia (PCP).
Inhaled pentamidine is not as effective as trimethoprim-sulfamethoxazole in preventing PCP.

Focal lobe infiltrates are more common in patients who have been receiving aerosol pentamidine prophylaxis. The sensitivity of induced sputum for PCP might be decreased in patients receiving pentamidine prophylaxis.

This patient requires bronchoscopy with bronchoalveolar lavage for diagnosis; trimethoprim-sulfamethoxazole is the treatment of choice unless the patient is allergic.

Isoniazid, rifampin, ethambutol and pyrazinamide are used in the treatment of tuberculosis. TB would definitely be on the list of differentials. However, the radiological finding of upper lobe infiltrates is more commonly seen with PCP (especially those who have been on inhaled pentamidine prophylaxis).

Itraconazole is the wrong answer.

_Pneumocystis jiroveci_ pneumonia is officially classified as fungal pneumonia, but lacks ergosterol and is not susceptible to antifungal drugs that inhibit ergosterol synthesis.

Ganciclovir is the treatment of choice for cytomegalovirus (CMV) infections. CMV is a differential diagnosis for PCP. It also presents with fevers, dyspnoea, and cough as the symptoms. However, it is very uncommon in patients who are HIV positive (the reason for this is not fully understood) meaning PCP is the more likely diagnosis here.

Clarithromycin and Amoxil are the empiric treatment for community-acquired pneumonias caused by bacteria.
A 51-year-old homeless man is seen in the Emergency Department with a two-day history of a painful left little finger. He speaks little English and a history is difficult to establish.

On examination, he has fusiform swelling of the finger with a small laceration on the pulp which looks old. The finger is held in flexion, there is pain on passive extension of the finger and tenderness on the volar aspect of the finger. Examination of the other fingers was unremarkable.

What is the diagnosis?

(Please select 1 option)

- Acute paronychia
- Cellulitis
- Flexor sheath infection ✅ Correct
- Interphalangeal joint septic arthritis
- Palmar space infection

Flexor sheath infection or infectious flexor tenosynovitis results from a microorganism (commonly *Staphylococcus aureus*) multiplying in the closed space of the flexor tendon sheath and culture-rich synovial fluid medium. This is usually secondary to penetrating trauma to the hand.

The septic process and this inflammatory reaction within the tendon sheath quickly interfere with the gliding mechanism, leading to adhesions and scarring. The ultimate consequences are tendon necrosis, disruption of the tendon sheath, and digital contracture.
Physical examination reveals Kanavel signs of flexor tendon sheath infection, which are:

- finger held in slight flexion
- pusiform swelling
- tenderness along the flexor tendon sheath, and
- pain with passive extension of the digit.

Treatment is urgent surgical washout of the flexor sheath and intravenous antibiotics.

Septic arthritis of the interphalangeal joints is extremely rare and usually presents with pain, swelling, and reduced range of motion of an individual joint.

Acute paronychia often presents with a history of minor trauma to the fingertip. The presenting complaints are pain, tenderness, and swelling in one of the lateral folds of the nail and not along the finger.

Palmar space infection is an infection of one or all the fascial compartments of the hand. It may result from untreated flexor sheath infection. It presents with pain and swelling of the entire hand with pain on massive movement of all digits. The patient in the scenario experienced pain on movement of the little finger only.

Cellulitis of the hand presents with generalised swelling, erythema and pain. The skin looks shiny and is warm to touch. Generally, there is no exacerbation of pain with finger movement.
A 23-year-old aid worker returns from a spell working alongside locals in a river delta area of Thailand.

During his journey home he developed profuse watery diarrhoea with nausea and vomiting. He opened his bowels some 30 times during the flight. Despite the airline staff trying to give him regular fluids he faints on his arrival in the United Kingdom and is brought to the Emergency Department.

On examination, his BP is 130/70 mmHg, with a pulse of 90. He has a postural drop of 30 mmHg on standing. There is diffuse abdominal tenderness and very active bowel sounds.

Investigations show:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>141 g/L</td>
<td>(13.0 - 18.0)</td>
</tr>
<tr>
<td>WCC</td>
<td>11.2 ×10 $^9$/L</td>
<td>(4 - 11)</td>
</tr>
<tr>
<td>PLT</td>
<td>395 ×10 $^9$/L</td>
<td>(150 - 400)</td>
</tr>
<tr>
<td>Na</td>
<td>144 mmol/L</td>
<td>(137 - 144)</td>
</tr>
<tr>
<td>K</td>
<td>3.1 mmol/L</td>
<td>(3.5 - 4.9)</td>
</tr>
<tr>
<td>Cr</td>
<td>199 μmol/L</td>
<td>(60 - 110)</td>
</tr>
<tr>
<td>Urea</td>
<td>15.1 mmol/L</td>
<td>(2.5 - 7.5)</td>
</tr>
</tbody>
</table>

Which of the following is the most important initial therapy?

(Please select 1 option)

- Ciprofloxacin
This man has evidence of severe dehydration. The suspicion is that he may have cholera, the risk of which is increased according to length of stay in an endemic area, and exposure to poorly cooked/infected seafood.

Fluid resuscitation is the mainstay of therapy for the condition which can lead to severe dehydration as evidenced here by the marked elevation in creatinine and urea.

Antibiotics may play a role in shortening the duration of clinical symptoms and impacting on excretion of *Vibrio* but they are not the mainstay of treatment. Thus, all of the other options are incorrect.

In some cases of severe disease, however, tetracyclines or quinolones may be considered.
A 21-year-old student presents to the Emergency Department with fever, cough and significant wheeze; he has returned a few days ago from a long trip working with an aid organisation in East Asia.

On examination he is pyrexial 37.8°C, his pulse is 88 and regular and his BP is 110/72 mmHg. He has marked wheeze on auscultation of his chest. There is an urticarial rash on his buttocks and he has some abdominal discomfort.

Investigations show:

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>123 g/L</td>
<td>(115-160)</td>
</tr>
<tr>
<td>White cell count</td>
<td>7.1 ×10⁹/L</td>
<td>(4-11)</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>0.8 ×10⁹/L</td>
<td>(0.04-0.4)</td>
</tr>
<tr>
<td>Platelets</td>
<td>182 ×10⁹/L</td>
<td>(150-400)</td>
</tr>
<tr>
<td>Sodium</td>
<td>139 mmol/L</td>
<td>(135-146)</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.1 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>102 µmol/L</td>
<td>(79-118)</td>
</tr>
</tbody>
</table>

Which of the following is the most likely cause?

(Please select 1 option)

- [ ] Diphyllobothrium
- [x] Enterobius
Strongyloides is associated with a larval stage, the pulmonary migration of which can lead to symptoms of bronchospasm with severe wheeze and shortness of breath. This is also known as Loeffler's syndrome.

Tapeworms, of which Diphyllobothrium and Taenia are species, result in predominantly gastrointestinal symptoms such as abdominal pain and intermittent obstruction.

Schistosomiasis can manifest as a cough, but symptoms are not usually as severe as those seen here.

Enterobius is a species of threadworm which does not have a larval stage which affects the lungs.
A 58-year-old man is admitted to the Emergency Department some five days after becoming unwell with influenza.

Over the past 48 hours he has become progressively more short of breath with a cough productive of purulent and bloody sputum.

On examination he is pyrexial 38.6 °C, his BP is 95/60 mmHg, pulse is 95 and regular. His saturations are 93% on air. There are signs of extensive right sided consolidation.

Investigations show:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>134 g/L</td>
<td>(135-177)</td>
</tr>
<tr>
<td>White cell count</td>
<td>14.9 ×10^9/L</td>
<td>(4-11)</td>
</tr>
<tr>
<td>Platelets</td>
<td>191 ×10^9/L</td>
<td>(150-400)</td>
</tr>
<tr>
<td>Sodium</td>
<td>135 mmol/L</td>
<td>(135-146)</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.1 mmol/L</td>
<td>(3.5-5)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>132 µmol/L</td>
<td>(79-118)</td>
</tr>
</tbody>
</table>

CXR shows right sided consolidation with evidence of cavitation.

Which of the following is the most appropriate therapy?

(Please select 1 option)

- Benzylpenicillin
- Ciprofloxacin
This gentleman has community-acquired pneumonia (CAP). The recent history of influenza may lead you to consider *Staphylococcus aureus* as the possible underlying organism, although this is an uncommon cause of CAP in the UK. It is more common in the winter months and coincident influenza-type symptoms in approximately 40%. Pneumonia complications approximately 3% of cases of influenza, 10% of those admitted have been confirmed to be due to *Staphylococcus aureus*.

In the majority of patients, CAP should be confirmed by chest radiography before the commencement of antibiotics. However, if patients are critically unwell they should be treated for the presumptive diagnosis. Antibiotic treatment should always be initiated within four hours of presentation.

CAP caused by *Staphylococcus aureus* is more likely to present with multilobar shadowing, cavitation, pneumatoceles and spontaneous pneumothorax than other organisms. However, there are no characteristic features of chest radiographs that allow a confident prediction of the likely pathogen. Therefore, the general guidelines for treatment of CAP should be followed until an organism is identified. *Staphylococcus aureus* carries a high mortality, and therefore if suspected treatment should initially be for a severe CAP (see below for details).

Low severity CAP (CURB 0-1) can be treated with amoxicillin 500 mg TDS PO. CURB 2 CAP should be treated with amoxicillin 500 mg-1 g TDS and clarithromycin 500 mg TDS. Alternatives are available if patients are allergic to any of the above combinations. High severity CAP (CURB 3-5) should be treated as soon as possible with co-amoxiclav 1.2 g TDS and clarithromycin 500 mg BD.

The oral route is recommended in those with low and moderate severity CAP. Patients treated with parenteral antibiotics initially should be switched to an oral regimen once clinical improvement is seen and the patients has been afebrile for at least 24 hours. For most patients with uncomplicated CAP 7 days of antibiotic treatment is recommended. For those with high severity pneumonia where an organism has not been identified, 7-10 days treatment is indicated and extended to 14-21 days where clinically needed.

If *Staphylococcus aureus* is identified, treatment should be altered. Non-MRSA organisms should be treated with flucloxacillin and/or rifampicin; an alternative for penicillin-allergic patients is teicoplanin and rifampicin. MRSA should be treated with vancomycin. A prolonged antibiotic course is indicated.

Further Reading:
Work Smart

Question 49 of 50

A 25-year-old woman is referred to the respiratory clinic as two of the children in her kindergarten class have recently been diagnosed with tuberculosis.

Clinical examination reveals a BP of 125/72 mmHg, pulse is 70 and regular. Her chest is clear. A Mantoux test results in a reaction measured at 17 mm.

Which of the following is the correct way to manage her?

(Please select 1 option)

- Arrange for a bronchoscopy
- Arrange for sputum samples to be collected
  - This is the correct answer
- Reassure her she is immune to TB and requires no further action
- Start anti-tuberculous chemotherapy
  - Incorrect answer selected
- Vaccinate her with BCG

The Mantoux test replaced the Heaf test in 2005 in the UK. One of its uses in for patients who have had close contact with a person known to have tuberculosis.

The injection site should be reviewed 48-72 hours following intradermal inoculation of tuberculin. The left forearm is typically used. Only the induration, not surrounding erythema, is used in the measurement and the longest diameter is measured in millimetres:

- Less than 6 mm - negative test, previously unvaccinated individuals can be given the BCG (within three months) provided there are no contraindications.
- More than 6 mm but less than 15 mm - hypersensitive to tuberculin protein (may be due to previous TB infection, BCG, or atypical mycobacteria). Patients are not given the BCG if part of an immunisation programme. However, in other contexts (e.g. immigrant screening and contact tracing), further investigation should and follow-up may be indicated.
- More than 15 mm - strongly hypersensitive to tuberculin, suggestive of TB infection. Patients should be referred for further investigation and treatment.

The reaction to tuberculin protein may be suppressed by viral infections, live viral vaccines, sarcoidosis, corticosteroids, immunosuppression, severe tuberculous disease and poor nutrition.

Bronchoscopy would not usually be considered unless other investigations have proved inconclusive.

Anti-tuberculous therapy is commenced only after infection is confirmed, and patients with a positive Mantoux do not require BCG vaccination.

Reference:

Mantoux Testing
A 24-year-old male presents with shortness of breath, chest pains and cough. He is a smoker of 10 pack/years and occasionally uses cocaine and ketamine. He uses PRN salbutamol inhaler for asthma diagnosed in childhood. He has been treated by his GP for chest infections four times in the past seven months, with different courses of antibiotics.

On examination, he has a white exudate on his tongue and throat. His examination is otherwise normal. The nursing staff tells you that his saturations drop to 74% on room air when walking to the bathroom.

What test will confirm your diagnosis?

(Please select 1 option)

- Chest x ray
- ECG
- Peak expiratory flow
- Sputum culture
- Sputum immunofluorescence

This gentleman has candidiasis of his throat that may be due to steroid inhaler usage (for his asthma) but given his other symptoms and history may well be secondary to HIV infection.

He has recurrent chest infections and now symptoms compatible with PCP infection (dry cough, chest pains, desaturation on exertion, normal chest examination).
The only test that will confirm this is sputum immunofluorescence. Severe cases should be treated with steroids in addition to co-trimoxazole or pentamidine.

Chest x ray classically shows perihilar interstitial shadowing, but this can occur with other infections and therefore is not conclusive evidence.

ECG will be unremarkable.

Peak expiratory flow (PEF) may show reduction in his ability due to exacerbation of asthma in the presence of infection, but again it is not a diagnostic test.

A straightforward sputum culture will not diagnose *Pneumocystis jirovecii*.
Question 150 of 164

A 43-year-old male presents with right iliac fossa pain and bloody diarrhoea for two days. He had a fever, headache and myalgia the day before diarrhoeal illness. He is passing liquid bloody stools 10 times daily.

He has a history of HIV and is on HAART. His CD4 count has been well controlled, above 400 cells/µL.

What is the cause for his diarrhoea?

(Please select 1 option)

- Appendicitis
- Antiretroviral medication
- Campylobacter
- Cryptosporidium parvum
- Cytomegalovirus

Campylobacter infection usually presents with bloody diarrhoea and 'pseudoappendicitis' (RIF pain). The patients often have a prodrome of fever, headache and myalgia. Campylobacter takes around seven to 10 days to incubate.

Both Cryptosporidium and Cytomegalovirus are found in patients with CD4 count less than 300 cells/µL. It causes chronic diarrhoea (more than four week’s duration).

Patients commencing on antiretroviral medication may suffer with diarrhoea. It usually is self-limiting,
lasting two to four weeks, and would not be associated with prodrome as in this case.

Given this gentleman's HIV status an infective cause for his diarrhoea is more likely than appendicitis.
Work Smart

In which of the following circumstances is MMR (measles, mumps and rubella) immunisation contraindicated?

(Please select 1 option)

- Family history of an adverse reaction following MMR immunisation
- HIV positive individual who is not immunosuppressed
- Patient is pregnant  Correct
- Personal history of febrile convulsions
- Unknown or inadequately documented immunisation history

There is only a small minority of individuals who cannot have the MMR vaccination.

The vaccine should not be administered to persons who are immunosuppressed (there are detailed guidelines that relate to specific conditions and the degree of immunosuppression which should be consulted on a case by case basis):

- those who have had a confirmed previous anaphylactic reaction to a previous dose of a measles, mumps or rubella-containing vaccination
- those who have a previous confirmed anaphylactic reaction to neomycin or gelatin, and
- pregnant women.

True anaphylaxis following the administration of the MMR vaccination is very rare and occurs at a rate of 3.5 to 14.4 per million doses.
If a minor allergic condition occurs this is not a contraindication to future vaccination. If there is any doubt then it is prudent to liaise with a specialist or local immunisation coordinator for further advice.

In terms of pregnancy being a contraindication, there is no evidence that MMR vaccines are teratogenic. There is theoretical concern that because vaccines such as MMR are 'live' that there is risk of fetal infection. Even though the available evidence does not link live vaccines with birth defects the Department of Health guidance states that because there is a theoretical risk of fetal infection that live vaccines should be delayed until after delivery. Therefore pregnancy is listed as a contraindication.

Inactivated vaccines cannot replicate and cannot cause infection in either the mother or the baby; however, they should only be used in pregnant women if protection is needed without delay.

Reference:

A 29-year-old man comes to the Emergency Department for review. He returned from a holiday in Spain two weeks earlier, and now complains of fevers, joint pains, pain passing urine and gritty eyes. There is no past medical history of note.

On examination his temperature is 37.9 °C, BP is 110/70, pulse is 70 and regular. There is joint pain affecting his left knee, right ankle and both feet, with limitation of movement. He also complains of low back pain on forward flexion. He has a psoriatic type rash affecting both feet and conjunctivitis.

Investigations:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>138g/l</td>
<td>135-180</td>
<td></td>
</tr>
<tr>
<td>WCC</td>
<td>9.4 x 10⁹/l</td>
<td>6-10</td>
<td></td>
</tr>
<tr>
<td>PLT</td>
<td>281 x 10⁹/l</td>
<td>150-400</td>
<td></td>
</tr>
<tr>
<td>Na</td>
<td>139 mmol/l</td>
<td>135-145</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>4.2 mmol/l</td>
<td>3.5-5.5</td>
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<td>Cr</td>
<td>105 µmol/l</td>
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<td>CRP</td>
<td>68 mg/l</td>
<td>&lt;10</td>
<td></td>
</tr>
<tr>
<td>ESR</td>
<td>55 mm/hr</td>
<td>&lt;10</td>
<td></td>
</tr>
</tbody>
</table>

Which of the following is the most appropriate initial intervention?

(Please select 1 option)

- [ ] Doxycycline
The answer is Naproxen. The clinical picture as described here is of reactive arthritis, which may have occurred as a result of chlamydial infection, although in about 10% of patients a preceding infection is not identified. Initial therapy of choice for the condition is NSAIDs. Other interventions such as corticosteroids are second line therapies. Antibiotics should be used where the causative infection is identified and is still active, and may shorten the duration of symptoms.

Prednisolone may be considered if the response to NSAIDs is poor. There is limited experience with second line agents such as methotrexate and sulphasalazine, although small case series suggest a benefit.

Where there is significant joint effusion, aspiration can be considered. This is especially important if only one joint is involved, as septic arthritis should be excluded as a cause.
A 22-year-old student comes to the Emergency Department with jaundice, right upper quadrant pain, nausea and vomiting. He recently returned from a trip to Thailand 12 days ago and maintains that he had all appropriate vaccinations and was compliant with anti-malarial therapy. He is usually well, takes no regular medication, drinks 10 units of alcohol per week and smokes 5 cigarettes per day.

On examination, his BP is 105/80, pulse is 88 and regular, his temperature is 37.9 °C, and he has jaundiced sclerae. There are scratch marks over the upper body and abdomen. His abdomen is soft, although there is obvious hepatic tenderness on palpation.

Investigations:

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Hb</td>
<td>138g/l</td>
<td>135-180</td>
</tr>
<tr>
<td>WCC</td>
<td>10.2 x10⁹/l</td>
<td>6-10</td>
</tr>
<tr>
<td>PLT</td>
<td>158 x 10⁹/l</td>
<td>150-400</td>
</tr>
<tr>
<td>Na</td>
<td>138 mmol/l</td>
<td>135-145</td>
</tr>
<tr>
<td>K</td>
<td>3.5 mmol/l</td>
<td>3.5-5.5</td>
</tr>
<tr>
<td>Cr</td>
<td>105 µmol/l</td>
<td>50-110</td>
</tr>
<tr>
<td>Glucose</td>
<td>5.9 mmol/l</td>
<td>&lt;7.0</td>
</tr>
<tr>
<td>ALT</td>
<td>2150 U/l</td>
<td>7-56</td>
</tr>
<tr>
<td>Alk phos</td>
<td>295 IU/l</td>
<td>44-147</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>52 µmol/l</td>
<td>&lt;22</td>
</tr>
</tbody>
</table>
Which of the following is the most likely diagnosis?

(Please select 1 option)

- [ ] Hepatitis A  [ ] Incorrect answer selected
- [ ] Hepatitis B
- [ ] Hepatitis C
- [ ] Hepatitis D
- [x] Hepatitis E  [ ] This is the correct answer

The answer is Hepatitis E. Given that no risk-taking behaviour has been described in the scenario, and this patient maintains they are up to date and compliant with vaccinations and travel medicines, viral hepatitis transmitted via the faeco-oral route, not covered by the vaccination schedule, is the most likely cause of his presentation. Hepatitis E presents with a similar clinical picture to hepatitis A, with a short flu like illness, followed by acute hepatitis. Incubation period ranges from 15 to 60 days, and symptoms are generally reported as slightly more severe compared to hepatitis A.

Hepatitis A vaccination is highly effective and is recommended for travel to South East Asia, as such it is unlikely he has hepatitis A infection. There is no documented exposure to body fluids and no use of intravenous drugs, reducing the chances of this being acute hepatitis B or C. Hepatitis D infection can only be propagated in the presence of existing hepatitis B infection, making it an unlikely answer here.

Answer Statistics

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<td>4</td>
<td>1%</td>
</tr>
<tr>
<td>5</td>
<td>17%</td>
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Times answered: 2510
A 32-year-old man is brought to the Emergency Department after his partner called an ambulance. He has deteriorated significantly over the past few days, having suffered headaches, drowsiness and increasing confusion. That morning on waking he was unable to move his left arm.

On further questioning of his partner, it transpires he has slowly deteriorated with a chronic cough, weight loss and intermittent night sweats over the past four months. He admits they have had unprotected sexual intercourse with other males during a holiday approximately one year ago.

On examination his BP is 145/80, pulse is 88 and regular. On neurological examination he is drowsy and confused, mumbling when you ask him to perform tasks. There is bilateral papilloedema on fundoscopy, he appears to be in pain on neck flexion, and is neglecting his left hand side. CT shows meningeal enhancement and evidence of hydrocephalus.

You suspect cryptococcal meningitis as a result of HIV, and would like to test him for HIV.

Which of the following is the recommended course of action as the patient is unable to give informed consented to be tested?

(Please select 1 option)

- He cannot be tested until he is able to give consent
- The hospital solicitor should decide if testing is appropriate
- **You may test him to allow appropriate therapy to be prescribed**
- You must ask his partner for permission to test
- You must ask his direct blood relative for permission to test
The answer is you may test him to allow appropriate therapy to be prescribed. In this situation, guidelines suggest testing is possible without patient consent if it may impact on therapy choices. Although HIV testing may not necessarily influence anti-fungal prescription, it may direct use of a high-dose amphotericin B regimen, (1 mg/kg vs 0.7 mg/kg), or use of the high dose fluconazole flucytosine combination approach. Earlier institution of HAART may also improve the response to antifungals and prevent further opportunistic infections.

Not testing until he is able to give consent risks not optimising therapy as early as possible, raising the possibility of under or overuse of appropriate pharmaceutical interventions.

Nobody else is able to give consent for a patient. Whilst you might want to discuss the situation with your hospital legal team if there are concerns from the patient’s partner or other relatives, it is inappropriate to delay testing in this situation whilst gaining a legal opinion.

Further reading:

UK National Guidelines for HIV Testing 2008
A 31-year-old asylum seeker of African descent comes to the Emergency Department escorted by immigration officers. According to his partner he has suffered from a chronic cough and weight loss over the past few months. Over the past few days he has become confused complaining of an occipital headache.

On examination, his BP is 115/85, pulse is 82 and regular, his temperature is 37.9 °C. There is bilateral wheeze on auscultation of the chest and he has obvious meningism on neurological exam.

Investigations:

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Normal Range</th>
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<tr>
<td>Hb</td>
<td>118 g/l</td>
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<tr>
<td>WCC</td>
<td>10.5 x10⁹/l</td>
<td>6-10</td>
</tr>
<tr>
<td>PLT</td>
<td>192 x 10⁹/l</td>
<td>150-400</td>
</tr>
<tr>
<td>Na</td>
<td>135 mmol/l</td>
<td>135-145</td>
</tr>
<tr>
<td>K</td>
<td>4.3 mmol/l</td>
<td>3.5-5.5</td>
</tr>
<tr>
<td>Cr</td>
<td>97 µmol/l</td>
<td>60-110</td>
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<tr>
<td>CRP</td>
<td>105 mg/l</td>
<td>&lt;10</td>
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<td>Glucose</td>
<td>6.9 mmol/l</td>
<td>&lt;7</td>
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<tr>
<td>CSF glucose</td>
<td>3.1 mmol/l</td>
<td></td>
</tr>
<tr>
<td>CSF protein</td>
<td>1.3 g/l</td>
<td>0.2-0.5</td>
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<tr>
<td>CSF</td>
<td>lymphocytosis</td>
<td></td>
</tr>
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</table>
What is the recommended duration of anti-tuberculous therapy in this gentleman's case?

(Please select 1 option)

- At least 2 months
- At least 3 months
- At least 6 months
- At least 9 months
- At least 12 months

The answer is at least 12 months. Treatment for CNS tuberculosis consists of an initial four-drug period for two months, usually including rifampicin, isoniazid, pyrazinamide and ethambutol, followed by a two-drug therapy period for 9-12 months consisting of isoniazid and rifampicin alone.

Where there is evidence of a tuberculoma up to 18 months of treatment is required. Adjunctive corticosteroids are given for CNS TB, as they are thought to reduce death or permanent disability by up to 30%.

The other treatment durations are too short to achieve adequate eradication of tuberculosis. Two months is merely the period of intense initial anti-tuberculous therapy. Six months of therapy is usually given for patients with respiratory tuberculosis, without CNS involvement.

Reference and Further Reading:

British Infection Society guidelines for the diagnosis and treatment of tuberculosis of the central nervous system in adults and children
A 19-year-old medical student presents at the Emergency Department with severe shortness of breath and a dry cough. He was diagnosed with chickenpox two days prior, with a sore throat and fever and an extensive vesicular rash affecting the face, trunk, arms and legs.

On examination his temperature is 37.9°C, pulse is 86 and regular, O₂ saturations on air are 90%. There is fine wheeze on auscultation of the chest and scattered crackles. Chest radiograph reveals small nodules throughout both lung fields and diffuse pulmonary infiltrates. CRP is elevated at 85 mg/dl (<10). He is commenced on O₂ therapy.

Which of the following is the most appropriate intervention?

(Please select 1 option)

- Clarithromycin and co-amoxiclav
- Flucloxacillin
- **IV aciclovir** □ This is the correct answer
- Oral aciclovir □ Incorrect answer selected
- Varicella zoster immunoglobulin

The answer is IV aciclovir. The chest x-ray features and elevation in CRP are consistent with chickenpox pneumonia. As such, admission and treatment with IV aciclovir is indicated.

The role of corticosteroids in this situation is controversial, uncontrolled case series have suggested a potential benefit, but this has not been confirmed in randomised controlled trials.
Clarithromycin and co-amoxiclav are the standard therapy for community-acquired pneumonia, but the picture seen here doesn't really fit with that, particularly the diffuse nodular changes on CXR.

Flucloxacillin is of value in the treatment of post viral bacterial pneumonia which may be due to Staphylococcal infection. Oral aciclovir and varicella zoster Ig are less effective in this situation versus IV aciclovir.

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**Answer Statistics**

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Times answered: 2485

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**Test Analysis**

<table>
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<th>Incorrect</th>
<th>Partially</th>
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</thead>
<tbody>
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</table>

Score: 53.55%

Total Answered: 155
Work Smart

Question 156 of 164

A 24-year-old Indian deck hand is admitted as an emergency following a collapse shortly after his ship docked. According to the ships' medical officer, he had been suffering from a sore throat over the past two days which diagnosed as a viral infection. He is usually fit and well and takes no regular medication.

On examination, he is pyrexial (temperature 38.9°C), his BP is 100/60, and pulse 61 and regular. He has marked cervical lymphadenopathy and pharyngitis with a grey/white membrane overlying the tonsils.

Investigations:

<p>| | | |</p>
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</thead>
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<td>Hb</td>
<td>134g/l</td>
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<td>WCC</td>
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<td>PLT</td>
<td>182 x 10^9/l</td>
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<td>Na</td>
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<td>Cr</td>
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<td>ESR</td>
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<tr>
<td>CRP</td>
<td>190 mg/dl</td>
<td>&lt;10</td>
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</table>

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Cytomegalovirus infection
The answer is diphtheria infection. The clues here include the gentleman’s ethnic background (uptake of the diphtheria vaccination is less in India than in the UK), severe pharyngitis with lymphadenopathy and the presence of a greyish pseudomembrane over the tonsillar bed.

The relative bradycardia, potentially due to diphtheria exotoxin, is a further pointer to the diagnosis. Definitive diagnosis is via culture of blood or tonsillar exudate, but prior to this, the patient should be treated with antibiotics (usually a macrolide or penicillin). Airway support may also be required in severe cases, and the patient should be monitored closely.

CMV rarely causes isolated pharyngitis, and EBV would be less likely given the markedly raised CRP and the presence of a pseudomembrane on the tonsils. Pertussis infection is characterised by a marked cough, which is not described here. Streptococcal throat infection is a reasonable alternative diagnosis, although formation of a pseudomembrane would be unusual in this context.

Answer Statistics

<table>
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<tr>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>5</td>
<td>6%</td>
</tr>
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</table>

Times answered: 2516
Work Smart

Question 157 of 164

An 18-year-old student comes to the Emergency Department for review. He has a severe pharyngitis with high fever which has developed over the past 24 - 48 hours. Apart from mild asthma for which he takes Seretide 50, he has no past medical history of note.

On examination his BP is 105/80, pulse is 90 and regular, he is pyrexial at 38.5°C. There is cervical lymphadenopathy and pharyngitis with exudate. His abdomen is soft and non-tender.

Investigations:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>130g/l</td>
<td>135-180</td>
</tr>
<tr>
<td>WCC</td>
<td>6.0x10⁹/l</td>
<td>6-10 (atypical lymphocytes seen on film)</td>
</tr>
<tr>
<td>PLT</td>
<td>189 x 10⁹/l</td>
<td>150-400</td>
</tr>
<tr>
<td>Na</td>
<td>140 mmol/l</td>
<td>135-145</td>
</tr>
<tr>
<td>K</td>
<td>3.7 mmol/l</td>
<td>3.5-5.5</td>
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<tr>
<td>Cr</td>
<td>105 µmol/l</td>
<td>60-110</td>
</tr>
<tr>
<td>CRP</td>
<td>65 mg/dl</td>
<td>&lt;10</td>
</tr>
<tr>
<td>EBV spot test</td>
<td>negative</td>
<td></td>
</tr>
</tbody>
</table>

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Acute myeloid leukaemia
The answer is EBV. Given this patient’s presentation with severe pharyngitis and atypical lymphocytes on the blood film, coupled with a relatively modest rise in CRP, EBV should be considered the likely diagnosis until proven otherwise. The catch here is that antibody testing has up to a 25% chance of being negative, despite active EBV infection, during the first week of symptoms. Management is supportive, and re-testing can be considered a week later.

CMV is a possibility, as it can present with an infectious mononucleosis-type syndrome which mimics EBV but EBV is much more common in this situation (80% of such cases are caused by EBV). There is a wide spectrum of other presentations of CMV, including viral pneumonia, transaminitis, splenomegaly, colitis, encephalitis, cytopenia, and pyrexia of unknown origin (PUO).

The rise in CRP is very modest and accompanied by atypical lymphocytes, which counts against S pyogenes as the likely cause of his symptoms. Although AML and CML do present with pharyngitis and lymphadenopathy, in percentage terms, they are much less likely to be the diagnosis here and would in all probability be associated with a much longer prodromal illness and more significant abnormalities on full blood count.
A 27-year-old man comes to the Emergency Department with a 14 hour history of severe abdominal pain with bloody diarrhoea. He has opened his bowels 12 times overnight. Apparently he shared an Indian takeaway with friends two days earlier, and one of the friends is also ill with similar symptoms. On examination he is pyrexial at 38.1°C, his BP is 100/70mmHg, with a postural drop of 15mmHg, and his pulse is 90bpm and regular. His abdomen is generally tender, with worse pain affecting the right iliac fossa. He provides a stool sample which contains liquid faeces mixed with blood and mucus.

Which of the following is the most likely diagnosis?

(Please select 1 option)

- Amoebic dysentery
- Campylobacter [Correct]
- E coli 157
- Norovirus
- Salmonella

The answer is campylobacter. The clues here include the history of a recent takeaway meal, the fact one other member of the party is ill, and the gap of approximately one / two days before symptoms began. Coupled with bloody diarrhoea, and tenderness in the RIF, the history fits well with a diagnosis of campylobacter infection. Faeces should be sent for microscopy and culture to confirm the diagnosis. The disease is usually self limiting and antibiotics are not needed, although response
to azithromycin and erythromycin has been demonstrated.

Amoebic dysentery is associated with a longer incubation period of seven days or greater, and a history of travel would be expected. Norovirus is associated with marked diarrhoea and vomiting without blood, limited to a period of 24-36hrs. E coli 157 and salmonella may also be associated with bloody diarrhoea, but a slightly shorter incubation period of only 12hrs may be seen for salmonella, and with E coli 157, diarrhoea is initially not bloody, but may become so after 1-3 days.

Answer Statistics

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Times answered: 2485

Test Analysis

Correct Incorrect Partially Correct
A 25-year-old man presents to the Emergency Department a few days after returning from a holiday to Greece for a stag party. He admits to unprotected sexual intercourse during the trip and now complains of pain on passing urine, pus-like urethral discharge, and swelling/limitation of movement affecting his right knee.

On examination his BP is 115/82 mmHg, pulse is 85 bpm and regular. A sample of urethral discharge is sent for microscopy, culture and sensitivity. Flexion of his right knee is limited to 30 degrees, there is erythema and an effusion. Gram stain of the urethral discharge reveals gram negative diplococci.

Which of the following is the most appropriate treatment?

(Please select 1 option)

- Amoxicillin oral for 7 days
- Azithromycin single dose
- Azithromycin and ceftriaxone IM single doses
- Ceftriaxone IV for 48 hrs then oral ciprofloxacin
- Ciprofloxacin oral for 7 days

The answer is Ceftriaxone IV for 48 hours then oral ciprofloxacin. It is likely this patient has disseminated gonococcal infection, leading to monoarthritis affecting the right knee. As such IV therapy for at least 48 hours followed by oral antibiotics is the most appropriate way to manage his disease.
The conventional single dose oral and IM approach is inadequate in this situation. If rapid improvement in the monoarthritis does not occur, then therapeutic drainage and washout may be considered.

Amoxicillin and quinolones are no longer considered first line therapy for gonorrhoea because of the risk of resistance. Although azithromycin and ceftriaxone combination therapy is the preferred approach to uncomplicated infection, the monoarthritis prompts the IV approach here.

Azithromycin high dose, (2 g), may be used as monotherapy, but tolerability is poor, and it may increase the propensity for resistance to develop long term.

Reference & Further Reading:

BASSH: UK national guideline for the management of gonorrhoea in adults, 2011
Work Smart

Question 160 of 164

A 41-year-old gentleman is referred to the medical team with recurrent episodes of right sided abdominal pain, present intermittently for two months. On examination he is febrile (38°C), his abdomen is soft with no organomegaly, and breath sounds are reduced bibasally.

An abdominal x ray is done, which is shown below:

Which of the following is the most appropriate definitive management option?

(Please select 1 option)

- Antitubercular therapy
- IV antibiotics
- Laparotomy
The man has a prolonged history of abdominal pain, he has fever, and the abdominal x-ray shows an air-fluid level below the right diaphragm. Therefore, the most likely diagnosis is a subphrenic abscess. The most appropriate definitive step in management is percutaneous drainage, which should be done under radiological guidance. This is usually given in combination with IV antibiotics, initially empirical but then guided by culture of the abscess fluid.

IV antibiotics alone, however, are unlikely to penetrate the abscess and resolve it.

Laparotomy may be required if percutaneous drainage fails or is not possible, but it is associated with greater morbidity than percutaneous drainage.

Tuberculosis can result in subphrenic abscesses, but there is nothing else in this patient's history to suggest this as the underlying cause, so antitubercular therapy is not the most appropriate choice.

Decompression with a nasogastric tube is required in cases of bowel obstruction, a single air-fluid level usually does not represent bowel obstruction, and this level does not seem to be within the bowel.
A 27-year-old female presents to the medical take. She has been unable to get an appointment at her GP and is concerned as she has noticed frank haematuria for the last 8 days. She has no dysuria or frequency. She reports she has noticed four episodes of haematuria previously, but these have always resolved spontaneously after a day or two.

She reports she is usually fit and well apart from hearing aids that she has needed since birth. This doesn't seem unusual to her as both her younger sister also has needed hearing aids since birth. She works as a primary school teacher and lives with her mother and her sister. Her parents divorced when she was 7 and she has not had any contact with her father since.

On examination, she has an abdomen that is soft and non-tender. Her Rinne test was positive and her Weber test was equally heard in both ears.

Investigations show:

- Haemoglobin 127g/l, WCC 6 x 10^9/l, Platelets 376 x 10^9/l
- Sodium 139 mmol/l, Potassium 5.2 mmol/l, Urea 13 mmol/l, Creatinine 292 mmol/l
- Urine dip - blood +++, protein +++, leucocytes negative, nitrites negative

What is the most likely diagnosis?

(Please select 1 option)

- Alport's Syndrome  □ Correct
- Goodpasture Syndrome
- IgA nephropathy
- Minimal change disease
This young woman has recurrent painless haematuria, deteriorated renal function and a sensorineural deafness as demonstrated by the Rinne and Weber test. She also has a family history of sensorineural deafness. Since she has not seen her father for many years she may discover that he too has renal failure and hearing problems. It would be important to investigate her sister’s renal function.

Alport’s syndrome is a genetic disorder leading to mutations on collagen type 4. This type of collagen is found in the basement membrane of the kidney, the eye and the cochlear leading the renal, hearing and eye problems. It is commonly X-linked, but may be seen in a less severe, lyonisation pattern in affected females. It can also present in a dominant or recessive fashion. Diagnosis is made on tissue biopsy and genetic testing.

References:

Clinical practice recommendations for the treatment of Alport syndrome: a statement of the Alport Syndrome Research Collaborative
Work Smart

Question 162 of 164

An 18-year-old male presents to the general medical take. He presents with large grey lesions around his perineum and in his mouth which started 2 days ago. He reports that he has a more general rash on his trunk and the palms and soles of his feet. He generally feels unwell with malaise and fever. He has never had anything like this before, but mentions that he did see a small ulcer on his scrotum a month ago that didn't hurt and healed on its own.

He reports that he is generally fit and well and has just moved to the area to start his university studies.

On examination he has a symmetrical, widespread, macular popular rash on his trunk, limbs and the palms and soles of his feet. This is different from the large greyish lesions that you see in his mouth and perineum. His has general lymphadenopathy that is minimally tender on palpation. His chest is clear on auscultation, there are no added heart sounds and his abdomen is soft and non-tender.

Investigations show:

Haemoglobin 13g/dl, WCC 11 x 10^9/l , Platelets 352 x 10^9/l, CRP 89
Sodium 145 mmol/l Potassium 3.8 mmol/l, Urea 4 mmol/l, Creatinine 82 mol/l

What is the most likely diagnosis?

(Please select 1 option)

- Cytomegalovirus
- Epstine Barr Virus
- Herpes Simplex Virus
- HIV
This young man presents with a symmetrical rash on his trunk, palms, and soles that is pathognomonic for secondary syphilis. He also has a further rash of grey lesion in the mouth and perineum associated with syphilis. Although he was not concerned about it, he has also mentioned that he had a painless genital ulcer one month ago that may have represented his primary syphilis infection. He has general lymphadenopathy and epitrochlear nodes are particularly suggestive of the diagnosis.

He is a young man that has recently started university and is likely to be enjoying this period of parties and new acquaintances. It would be worth exploring his sexual history further as syphilis is more common in men who have sex with men. Patients are often co-infected with other sexually transmitted diseases and this patient should be further investigated for these.

References:

UK national guidelines on the management of syphilis 2015
A 72-year-old man presents to the tuberculosis clinic. He has a 6-month history of lower back pain that has been gradually getting worse. He has tried taking analgesia, but this is now no longer helping the pain and he is becoming less able to mobilise.

He lives with his wife on their farm. He has been fully independent until his recent deterioration in mobility.

Past medical history includes hypertension, diet controlled type 2 diabetes mellitus and benign prostatic hypertrophy. He reports that he had tuberculosis when he was 24, but this was treated. He can't remember what he was treated with.

An MRI spine shows an L4/5 discitis and a biopsy of this tissue is arranged. Acid-fast bacilli are grown on culture of the biopsy.

What treatment regime should be started?

(Please select 1 option)

- 2 months of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol with a further 4 months of Isoniazid and Rifampicin
- 2 months of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol with a further 7 months of Isoniazid and Rifampicin
- 3 months of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol with a further 6 months of Isoniazid and Rifampicin
- 6 months of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol
- 6 months of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol with a further 6 months of Isoniazid and Rifampicin
Treatment for bone and joint tuberculosis is recommended to continue for 2 months with the initial phase consisting of quadruple therapy and the remaining 4 months as dual therapy. It is recommended not to extend treatment for residual complications such as collapsed discs or bending of the spine.

References:

NICE Guidance: Tuberculosis