Edited past paper

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Collected from :
Final 018
final 020
Dr Ahmad Alhaj file

The following topics should be studied very well as most of the questions are about them:

1) Brucellosis.

2) TB.

3) Side effects and uses of levofloxacin, Metronidazole, Ciprofloxacin, vancomycin and ceftriaxone.

4) HIV.

5) Vaccines: which of them are safe in pregnancy, flu and hepatitis vaccines.

6) C. difficile.

7) There are some questions on parasitic and worm infections: tinea, enterobius, ascaris.

8) Memorize SIRS criteria: there are some questions about it from 2012-2014 exams, you also have to memorize it for other systems like GI.

9) PPD test positive criteria, rule of 3, and AIDS-defining illnesses: see the last page.

- *Questions are followed by their explanation*

1) A 32-year-old woman was just diagnosed with HIV, which of the following is the most appropriate action?

A) give treatment only if her viral load above 50,000 copies /ml

B) Give treatment only if she's not pregnant

C)Await 2 months and then start treatment

D) Start antiretroviral treatment

E) Give treatment only if her CD4 count is below 200 cells/mL

Answer: D

Starting ART

Guidelines now recommend starting ART in all people with confirmed HIV infection, irrespective of CD4 count or clinical status. Early initiation of ART, compared with the previous strategy of deferring ART until CD4 thresholds or clinical disease occurs, has been shown to reduce morbidity and mortality, and has the additional benefit of reducing the risk of transmission. In asymptomatic PLWH initiating ART on the same day that the diagnosis is confirmed has been shown to improve retention in care.

2) A patient said that he noticed smooth brown worms around 40 cm in length coming out of his anus. This worm is most likely?

A) Ascaris lumbricoides

B) Trichuris trichuria

C) Ankylostoma duodenale

D) Necator americanus

E) Enterobius vermicularis

Answer: A

Ascaris lumbricoides (roundworm)

This pale yellow nematode is 20–35 cm long and the largest of the intestinal nematodes. Humans are infected by eating food contaminated with mature ova. *Ascaris* larvae hatch in the duodenum, migrate through the lungs, ascend the bronchial tree, are swallowed and mature in the small intestine. This tissue migration can provoke both local and general hypersensitivity reactions, with pneumonitis, eosinophilic granulomas, wheezing and urticaria.

Clinical features

Intestinal ascariasis causes symptoms ranging from vague abdominal pain to malnutrition. The large size of the adult worm and its tendency to aggregate and migrate result in obstructive complications. Tropical and subtropical areas are endemic for ascariasis, and here it causes up to 35% of all intestinal obstructions, most commonly in the terminal ileum. Obstruction can be complicated further by intussusception, volvulus, haemorrhagic infarction and perforation. Other complications include blockage of the bile or pancreatic duct and obstruction of the appendix by adult worms. Ascariasis in non-endemic areas has been associated with pig husbandry and may be caused by *Ascaris suum*, which is indistinguishable from *A. lumbricoides*.

3) Which of the following is FALSE about brucellosis?

A) The most common focal complication is osteoarticular infections

B) It is commonly transmitted from human to human

C) Brucella abortus is the most virulent brucella species

D) It should be treated for several weeks

E) B+C

Answer: E

Brucellosis

Brucellosis is an enzootic infection (i.e. endemic in animals) caused by Gram-negative coccobacilli. The four species causing human disease and their animal hosts are: *Brucella melitensis* (goats, sheep and camels in Europe, especially the Mediterranean basin, the Middle East, Africa, India, Central Asia and South America), *B. abortus* (cattle, mainly in Africa, Asia and South America), *B. suis* (pigs in South Asia) and *B. canis* (dogs). *B. melitensis* causes the most severe disease; *B. suis* is often associated with abscess formation.

i 13.42 Treatment of brucellosis

Adults with non-localised disease

- Doxycycline 100 mg twice daily orally for 6 weeks *plus* gentamicin 5 mg/kg IV once daily for 7 days
  or
- Doxycycline 100 mg twice daily *plus* rifampicin 600–900 mg orally once daily for 6 weeks

Bone disease

- Doxycycline 100 mg twice daily *plus* rifampicin 600–900 mg once daily orally for 6 weeks *plus* gentamicin 5 mg/kg IV once daily for 7 days
  or
- Ciprofloxacin 750 mg twice daily orally *plus* rifampicin 600–900 mg orally once daily for 3 months

- *B. melitensis*
  - the most virulent and causes the most severe and acute cases
  - the most prevalent worldwide

Presentation

- Osteoarticular
  - symptoms affect 20-60% of patients
  - the most commonly reported complications
  - sacroiliitis is the most common

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  - symptoms affect 20-60% of patients
  - the most commonly reported complications
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4) which of the following antibiotics has been particularly associated with hemolytic reactions in patients with G6PD deficiency?

A) Dapsone

B) Clindamycin

C) Cloxacillin

D) Piperacillin

E) Vancomycin

Answer: A

Contraindications of dapsone:

- G6PD deficiency.
- Consider use in pregnant and breastfeeding women only if benefits outweigh the risks.
- Cautious use in patients with renal and/or hepatic dysfunction.

Antibiotics that trigger hemolysis in G6PD:

Dapsone, nitrofurantoin, TMP-SMX

ABX scattered examples with refreshment (MUST READ)	
Cephalosporins are contraindicated if penicillin laryngospasm/anaphylaxis	
Penicillin, Cephalosporin, Aminoglycosides need higher dose in pregnancy	
Penicillin, Cephalosporin, Vancomycin, Aminoglycosides need lower dose in elderly + eliminated by kidney	
Penicillin, Cephalosporin, Quinolones, Imipenem = CNS toxic especially if renal impaired	
Cefoxitin and Imipenem induce B lactamases: rapid inactivation of penicillin	
Clindamycin, Erythromycin, Metronidazole, Rifampin Adjust in liver failure (Eliminated by liver)	
Nafcillin, piperacillin, SMX, Cefotaxime Adjust in renal & liver (eliminated by both)	
Impaired blood flow: Impaired IM absorption	
G6PD with Sulfonamides, Nitrofurantoin, Dapsone, Nalidixic acid, Antimalarial: severe hemolysis	
Isoniazid **Inhibits** phenytoin + carbamazepine **metabolism** **Slow** acetylators: more risk of peripheral neuropathy	**Aminoglycosides** **Has neuromuscular block effect** **Nephro(reversible)+Ototoxicity (irreversible) if used for > 5 days**
Chloramphenicol **Inhibits** Phenytoin, Tolbutamide, Ethanol **metabolism** **BM suppression (dose related + idiosyn), aplastic anemia** **Grey baby syndrome**	**TMP-SMX** **Megaloblastic anemia + BM suppression** **Methemoglobinemia** **Hyper K+** **Crystalluria, Urostones**

5) The highest risk of needle stick injury is related to which of the following viruses?

A) Hepatitis A

B) HIV

C) Hepatitis C

D) Hepatitis B

E) Hepatitis E

Answer: D (HBV > HCV > HIV)

Transmission risk

- HIV 0.3%
- HCV 3%
- HBV 30%

Laboratory studies for HCP exposures [33][34][35]		
Baseline laboratory studies	Source patient	Exposed HCP
HIV	• HIV Ag/Ab or anti-HIV 1 and 2 • AND a rapid HIV test, if available	• HIV Ag/Ab or anti-HIV 1 and 2
HBV (only if HCP is nonimmune/immunity status unknown)	• HBsAg	• anti-HBs
HCV	• HCV RNA (preferred) • OR anti-HCV AND, if positive, HCV RNA	• Anti-HCV AND, if positive, HCV RNA

6) Most common cause of viral meningitis:

A) Herpesviruses

B) Enteroviruses

C) Lymphocytic choriomeningitis virus (LCMV)

D) Mumps

E) JC virus

Answer: B

Viral meningitis

Viruses are the most common cause of meningitis, usually resulting in a benign and self-limiting illness requiring no specific therapy. It is much less serious than bacterial meningitis unless there is associated encephalitis. A number of viruses can cause meningitis (see Box 28.59), the most common being enteroviruses. Where specific immunisation is not employed, the mumps virus is a common cause.

- **Viral meningitis**: often associated with encephalitis (meningoencephalitis)
  - Enteroviruses (especially coxsackieviruses and echoviruses): the most common cause of all types of meningitis in all patient groups [16]
  - Herpesviruses: HSV (meningitis is more commonly caused by HSV2 than HSV1), CMV, EBV, VZV
  - Lymphocytic choriomeningitis virus (LCMV)
  - Mumps virus
  - Measles virus
  - Some arboviruses (e.g., West Nile virus, TBEV in Eurasia)
  - Poliovirus (nonparalytic poliomyelitis: aseptic meningitic form)
  - St. Louis encephalitis virus
  - California encephalitis virus
  - Western equine encephalitis virus
  - Influenza virus
  - HIV
  - JC virus [17]

7) Negative PPD for latent TB:

A) 6 mm in a patient on long-term steroids

B) 12 mm in an immigrant from endemic/high prevalence country in the last 5 years

C) 7 mm in person with recent contact with active TB patient

D) 10 mm in a 60-year-old healthy woman

E) 13 mm in a mycobacteriology laboratory professional

Answer: D

Positive PPD TST according to induration diameter [44]	
≥ 5 mm	• Individuals exposed to AFB smear-positive case • Individuals with HIV • Individuals with clinical or radiographic evidence of active or prior TB • Individuals with organ transplants or receiving immunosuppressive therapy
≥ 10 mm	• Individuals who have moved within the last 5 years from a country with a high TB burden (> 20 cases per 100,000 population) [7] • Individuals living or working in high-risk settings (e.g., homeless shelters, prisons) • Individuals who inject drugs • Mycobacteriology laboratory workers • Individuals with illnesses such as diabetes and CKD • Children < 5 years of age • Children who have had contact with adults in high-risk categories • Individuals with low BMI
≥ 15 mm	• All otherwise healthy individuals with no known risk factors [72]

A) 6 mm in a patient on long-term steroids
➞ *Positive threshold = 5 mm* → **6 mm is POSITIVE**, so **NOT the answer.**
B) 12 mm in an immigrant from endemic/high prevalence country in the last 5 years
➞ *Positive threshold = 10 mm* → **12 mm is POSITIVE**, so **NOT the answer.**
C) 7 mm in person with recent contact with active TB patient
➞ *Positive threshold = 5 mm* → **7 mm is POSITIVE**, so **NOT the answer.**
D) 10 mm in a 60-year-old healthy woman
➞ *No risk factors, needs ≥15 mm to be positive* → **10 mm is NEGATIVE**, so **THIS IS THE CORRECT ANSWER.** ✅
E) 13 mm in a mycobacteriology laboratory professional
➞ *Positive threshold = 10 mm* → **13 mm is POSITIVE**, so **NOT the answer.**

8) Treatment for brucellosis in children:

A) Doxycycline only for 6 weeks

B) Rifampin only for 6 weeks

C) Doxycycline and Rifampin for 6 weeks

D) rifampin and TMP-SMX for 6 weeks

Answer: D

Treatment

- Multidrug regimens are the mainstay of therapy
    - because of high relapse rates reported with monotherapy
- Doxycycline and rifampin:
  - 6 weeks
- Doxycycline (6 weeks) + streptomycin (2-3 weeks)
  - more effective
- **Children** < 8 years
  - The use of rifampin + (TMP-SMX) for 6 weeks
- **Pregnant**:
  - Brucellosis treatment is a challenging problem
  - limited studies
  - rifampin alone or in combination with TMP-SMX

9) Sepsis is not associated with:

A) Dysesthesias in gloves-and-stocking distribution

B) Absent or reduced reflexes

C) ARDS

D) Metabolic alkalosis

E) Hypotension

Answer: D

- **General features**
  - **Fever**, chills, and diaphoresis
  - **Tachycardia**
  - **Tachypnea**
  - Generalized edema (capillary leak)
- **Features of organ dysfunction** (see SOFA score)
  - CNS impairment: altered mental status
  - Cardiovascular failure: hypotension
  - Coagulopathy → disseminated intravascular coagulation → petechiae, purpura
  - Liver failure: jaundice
  - Kidney failure: oliguria
  - Respiratory failure: symptoms of acute respiratory distress syndrome (ARDS)
- **Features of septic shock**
  - Hypotension (MAP < 65 mm Hg)
  - Altered skin and soft tissue perfusion
    - Early presentation: warm skin and normal capillary refill time (warm shock)
    - Late presentation: cold, cyanotic, pale, and/or mottled skin and prolonged capillary refill time (cold shock)
- **Common complications** [43]
  - Acute respiratory distress syndrome
  - Acute kidney injury
  - Diffuse intravascular coagulopathy
  - Acute liver failure
  - Myocardial dysfunction, e.g., cardiomyopathy, acute coronary syndrome
  - Multiple organ failure
- **Critical illness polyneuropathy** [53]
  - Definition: axonal injury, particularly to the motor neurons, as a sequela of sepsis and multiple organ dysfunction
  - Clinical features
    - Predominantly **distal, symmetrical, flaccid paralysis of the extremities** with muscle atrophy; may affect the **diaphragm**
    - **Absent or reduced reflexes**
    - **Dysesthesias** in a glove-and-stocking distribution may be present
    - Preservation of cranial nerve function
    - May be associated with critical illness myopathy: flaccid quadriparesis (proximal > distal); facial muscle weakness, sensation normal, tendon reflexes normal or ↑

Sepsis more commonly leads to **metabolic acidosis**, especially **lactic acidosis** due to hypoperfusion.

10) Wrong about IM influenza vaccine

A) Contraindicated in pregnancy

B) Contraindicated in immunocompromised patients

C) Contraindicated in bone marrow transplant patients

D) A +B

E) A + B +C

Answer: E

✓ **Influenza vaccine**

Given Annually , from September to may

Indications : elderly , **immunocompromised** , HCW , pregnancy and any person who wants to take it

2 types :

1-Inactivated vaccine : given by I.M injection

-This vaccine is safe in immunocompromised pt and pregnancy

-Composed of 3 or 4 strains of influenza virus :

A(H1) , A (H3) , B (Yamagata) +- B (Victoria)

2-Live attenuated vaccine : given by nasal spray

- Vaccines: the vaccine we use every year has the H1N1 strain of the 2009 pandemic

11) Drug that causes arthropathy:

A) Clindamycin

B) Levofloxacin

C) Amoxicillin

D) Metronidazole

E) Azithromycin

Answer: B

fluoroquinolone

Levofloxcacine : teratogenic , only > 18 y , athrragia and alteration the bone growth , tendon tearing , joint swelling

- **Seizure**
- **QT prolongation**
- photosensitivity,
- Insomnia
- **tendon rupture**
- Steven Johnson syndrome

12) Severe external ear pain and discharge, most likely organism:

A) klebsiella

B) staphylococcus aureus

C) pseudomonas aeroginosa

D) GAS

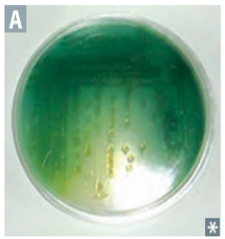
E) GBS

Answer: C

Malignant otitis externa

- **Pathogens** [2][3][4]
  - Similar to acute otitis externa (see "Etiology of OE")
  - ***P. aeruginosa*** is the most common cause, particularly in patients with diabetes. [4][5]
- **Risk factors for MOE** [3][4]
  - Older adults (> 60 years of age)
  - **Diabetes mellitus**
  - **Immunosuppression**

Pseudomonas aeruginosa



Aeruginosa—aerobic; motile, catalase ⊕, gram ⊖ rod. Non-lactose fermenting. Oxidase ⊕. Frequently found in water. Increased virulence in acidic environments. Has a grapelike odor.

PSEUDOMONAS is associated with: Pneumonia, Sepsis, Ecthyma gangrenosum, UTIs, Diabetes, Osteomyelitis, Mucoid polysaccharide capsule, Otitis externa (swimmer's ear), Nosocomial (healthcare-associated) infections (eg, catheters, equipment), Addiction (injection drug use), Skin infections (eg, hot tub folliculitis, wound infection in burn victims).

Mucoid polysaccharide capsule may contribute to chronic pneumonia in patients with cystic fibrosis due to biofilm formation.

Produces PEEP: Phospholipase C (degrades cell membranes); Endotoxin (fever, shock); Exotoxin A (inactivates EF-2); Pigments: pyoverdine and pyocyanin (blue-green pigment A; also generates ROS).

Corneal ulcers/keratitis in contact lens wearers/minor eye trauma.

Ecthyma gangrenosum—rapidly progressive, necrotic cutaneous lesion B caused by *Pseudomonas* bacteremia. Typically seen in immunocompromised patients.

Treatments:

- Antipseudomonal penicillins in combination with β-lactamase inhibitor (eg, piperacillin-tazobactam)
- 3rd- and 4th-generation cephalosporins (eg, ceftazidime, cefepime)
- Monobactams
- Fluoroquinolones
- Carbapenems

Despite antipseudomonal activity, aminoglycoside monotherapy is avoided due to poor performance in acidic environments.

a type of skin lesion characterized by vesicles or blisters which rapidly evolve into pustules and necrotic ulcers with undermined tender erythematous border. " Ecthyma" means a pus forming infection of the skin with an ulcer, "gangrenosum" refers to the accompanying gangrene

13) Which of the following is NOT considered anti-pseudomonal antibiotic?

A) Gentamycin

B) Cefepime

C) Ciprofloxacin

D) Ceftriaxone

E) Ceftazidime

Answer: D

🧠 "Z-CAR FACE GAP"

Each letter represents a key antipseudomonal drug or class:

- **Z** – **Zosyn** (Piperacillin–tazobactam)
- **C** – **Cefepime / Ceftazidime / Ceftolozane**
- **A** – **Aztreonam**
- **R** – **Resistance Fighters** (Ceftazidime–avibactam, Cefiderocol)
- **F** – **Fluoroquinolones** (**Ciprofloxacin**, Levofloxacin)
- **A** – **Aminoglycosides** (Amikacin, Tobramycin, Gentamicin)
- **C** – **Carbapenems** (Imipenem, Meropenem, Doripenem)
- **E** – **Exception: Ertapenem = No Pseudomonas**
- **G** – **Gram-negatives killer** (Polymyxins)
- **A** – **Avibactam combos** (again, Ceftazidime-avibactam)
- **P** – **Polymyxins** (Colistin / Polymyxin B)

Antipseudomonal antibiotic

An antibiotic used to treat infections caused by P. aeruginosa. Examples include antipseudomonal penicillins (e.g., piperacillin/tazobactam), carbapenems (e.g., meropenem), and cefipime.

Anti-pseudomonal antibiotics

Gentamicin , Cefepime , Ciprofloxacin. , Ceftazidime

14) Which of the following vaccines is contraindicated in persons with underlying immunodeficiency?

A) Influenza vaccine

B) Conjugated Pneumococcal vaccine

C) Measles-mumps-rubella (MMR) vaccine

D) Hepatitis B vaccine

E) Tetanus vaccine

Answer: C

✓**MMR vaccine**

Live attenuated , 2 doses , Given to women who experienced congenital rubella syndrome

*This syndrome happened in 90-95% of women who are infected with rubella during pregnancy especially in the first trimester , and there is very high risk of abortion

-MMR vaccine is not safe in pregnancy , and After the vaccine , pregnancy is not allowed for 2 months

-MMR vaccine is **contraindicated** in immunocompromised patients

15) 60-year-old man comes with productive cough, hemoptysis, weight loss, night sweats. His chest X-ray shows a right upper lobe cavity. You suspect that he has tuberculosis. His HIV test is negative. His sputum Acid Fast Bacillus was negative on three occasions. The best next step in his management is:

A) Repeat sputum AFB after one month

B) Do blood culture for mycobacteria

C) Do bronchoscopy

D) Treat empirically for TB

E) Do PPD test

Answer: C

Diagnosis

- sputum: in the early morning on 3 days
  - every 8 hours (hospital)
  - Children: early-morning gastric aspirate
- bronchoscopy with biopsy and bronchial washing
- bone marrow Bx
- liver Bx
- ± blood cultures

- PCR on smears

- Obtain HIV in all patients with TB
- CXR
  - may show a patchy
  - nodular infiltrate
  - upper-lobe involvement is most common
  - in any part of the lung
  - cavity: indicates advanced infection
    - high bacterial load
- Miliary TB: appearance of numerous small nodular lesions that resemble millet seeds on CXR

16) All the followings are true about Clostridium difficile disease EXCEPT:

A) It is diagnosed by detection of serum antibodies to toxin A and B

B) It is caused by Gram-positive bacilli

C) Recurrence rate can reach 20%

D) It is the most common cause of hospital-acquired diarrhea

E) It is treated by metronidazole

Answer: A

Clostridioides difficile (*C. difficile*; formerly known as *Clostridium difficile*) is a gram-positive bacillus that can cause antibiotic-associated diarrhea. Rates of *C. difficile* infection (CDI) are particularly high among hospitalized patients and residents in long-term care facilities because *C. difficile* spores are easily transmitted (fecal-oral route) and difficult to eradicate. The bacterium is resistant to multiple antibiotics, and colonization with *C. difficile* most commonly occurs following antibiotic treatment for other diseases. The resulting damage to the intestinal flora promotes *C. difficile* infection, which typically manifests with diarrhea accompanied by fever and abdominal pain.

Category		Treatment options
Initial episode	Nonsevere CDI or severe CDI	• First-line ◦ Oral fidaxomicin [3] ◦ OR oral vancomycin • Second-line for **nonsevere** cases (if vancomycin and fidaxomicin are unavailable or inappropriate, e.g., in patients with allergies): oral metronidazole[2]
	Fulminant CDI	• First-line: high-dose oral vancomycin[2] • Consider adding IV metronidazole [2] • In patients with paralytic ileus, consider adding vancomycin enemas.
Recurrent CDI	First recurrence	• If the initial episode was treated with standard-dose vancomycin: ◦ Oral fidaxomicin [3] ◦ OR tapered and pulsed oral vancomycin • If the initial episode was treated with metronidazole: [2] ◦ Oral fidaxomicin ◦ OR standard-dose oral vancomycin
	Subsequent recurrences	• Any of the following: ◦ Oral fidaxomicin ◦ Standard-dose oral vancomycin followed by oral rifaximin ◦ Tapered and pulsed oral vancomycin

Stool tests for toxins and toxigenic strains of C. difficile

Modalities

- **Tests with high sensitivity**
  - Enzyme immunoassay (EIA) for *C. difficile* glutamate dehydrogenase antigen (GDH)
  - NAAT (e.g., PCR) for *C. difficile* toxins
- **Tests with high specificity**: EIA for *C. difficile* toxins A and B
- **Other available tests**
  - Cytotoxicity neutralization assay (CCNA): detects toxin in stool
  - Culture of toxigenic strains of *C. difficile*

C. difficile infection is one of the rare indications for PO vancomycin in adults and children.

Intravenous administration of vancomycin is ineffective for *C. difficile* infection because vancomycin is insufficiently excreted into the colon.

17) Which of the following pathogens most commonly complicate H1N1 influenza:

A) H. influenza

B) Streptococcus pneumonia & staph aureus

C) Legionella pneumophila

D) Anaerobic bacteria

E) Mycoplasma pneumonia

Answer: B

Secondary bacterial bronchitis and pneumonia (postinfluenza pneumonia)

- **Etiology**: Common causative pathogens include *S. pneumoniae*, *S. aureus* (including MRSA), *S. pyogenes*, and *H. influenzae*. [29]
- **Clinical features**
  - Development of a purulent, productive cough ~ 4–14 days after an initial period of improvement [24]
  - Recurrent fever
  - Symptoms similar to community-acquired pneumonia
  - Postinfluenza *S. aureus* pneumonia can manifest with: [30]
    - Hyperacute onset of symptoms
    - Hypoxemia and cyanosis
    - Hemoptysis
    - Hypotension
- **Diagnostics**
  - Laboratory studies may show leukocytosis with left shift or leukopenia; ESR is typically elevated.
  - In pneumonia caused by *S. aureus*, a chest x-ray may show cavitations and pneumatoceles.
- **Treatment** [29]
  - Empiric antibiotic therapy for community-acquired pneumonia
  - Should include coverage for MRSA

18) All of the following are true about influenza vaccine EXCEPT:

A) It’s given annually

B) It is contraindicated in patients with Guillain-Barre syndrome

C) It is composed of three or four strains of influenza virus

D) It is contraindicated in immunocompromised patients

E) It is safe in pregnancy

Answer: D

19) All the following is true about Brucella except:

A) Brucella melitensis is more virulent than Brucella abortus

B) Treatment is at least for 6 weeks

C) Endocarditis is the most common cause of death

D) Sacroiliitis is a rare focal complication

E) It is a Gram-negative, facultative intracellular bacillus

Answer: D

20) All the following cutoffs for the PPD in the corresponding population are considered positive except:

A) 3 mm in an AIDS patient

B) 10 mm in a household contact of active TB case

C) 17 mm in healthy person

D) 8 mm in a patient with a kidney transplant

E) 13 mm in an IV drug abuser

Answer: A

Positive PPD TST according to induration diameter [44]	
≥ 5 mm	• Individuals exposed to AFB smear-positive case • Individuals with HIV • Individuals with clinical or radiographic evidence of active or prior TB • Individuals with organ transplants or receiving immunosuppressive therapy
≥ 10 mm	• Individuals who have moved within the last 5 years from a country with a high TB burden (> 20 cases per 100,000 population) [7] • Individuals living or working in high-risk settings (e.g., homeless shelters, prisons) • Individuals who inject drugs • Mycobacteriology laboratory workers • Individuals with illnesses such as diabetes and CKD • Children < 5 years of age • Children who have had contact with adults in high-risk categories • Individuals with low BMI
≥ 15 mm	• All otherwise healthy individuals with no known risk factors [72]

21) Which of the following isn’t a side effect to vancomycin?

A) red man syndrome

B) neutropenia

C) phlebitis

D) neuropathy

E) nephrotoxicity

Answer: D

Vancomycin

red man syndrome , nephrotoxicity 🥐 , bone marrow suppression , neutropenia, allergic reaction leading to hypotension , itching , erythema , and sometimes leads to sepsis , phlebitis

Glycopeptides (Vancomycin) VancoMAN		→ Renal failure	→ Eosinophilia → Neutropenia → Leukopenia → Thrombocytopenia			▪ RedMAN syndrome histamine release independent on IgE

Vancomycin

MECHANISM

Inhibits cell wall peptidoglycan formation by binding D-Ala-D-Ala portion of cell wall precursors. Bactericidal against most bacteria (bacteriostatic against *C difficile*). Not susceptible to β-lactamases.

CLINICAL USE

Gram ⊕ bugs only—for serious, multidrug-resistant organisms, including MRSA, *S epidermidis*, sensitive *Enterococcus* species, and *Clostridium difficile* (oral route).

ADVERSE EFFECTS

Well tolerated in general but not trouble free: nephrotoxicity, ototoxicity, thrombophlebitis, diffuse flushing (vancomycin infusion reaction A—idiopathic reaction largely preventable by pretreatment with antihistamines and slower infusion rate), DRESS syndrome.

Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) syndrome is a potentially life-threatening form of cutaneous drug adverse reaction. The severity of this syndrome is related to the systemic manifestations, which can result in multiorgan failure

MECHANISM OF RESISTANCE

Occurs in bacteria (eg, *Enterococcus*) via amino acid modification of D-Ala-D-Ala to D-Ala-D-Lac. "If you Lack a D-Ala (dollar), you can't ride the van (vancomycin)."

22) A patient with recurrent abscesses, pneumonia, and high IgE:

A) Defect in phagocytosis

B) Defect in chemotaxis

C) Mixed defect

Answer: B

Autosomal dominant hyper-IgE syndrome (Job syndrome)	Deficiency of Th17 cells due to *STAT*3 mutation → impaired recruitment of neutrophils to sites of infection	Cold (noninflamed) staphylococcal Abscesses, retained Baby teeth, Coarse facies, Dermatologic problems (eczema), ↑ IgE, bone Fractures from minor trauma	↑ IgE ↑ eosinophils Learn the ABCDEF's to get a Job STAT!

HYPER-IGE SYNDROME

1. Also called Job syndrome
2. Inheritance pattern: Autosomal Dominant
3. Presentation:
   a. Recurrent skin abscesses
   b. Recurrent pulmonary infections
   c. Recurrent *S aureus* infections
   d. Characteristic facial features (eg, broad nose)

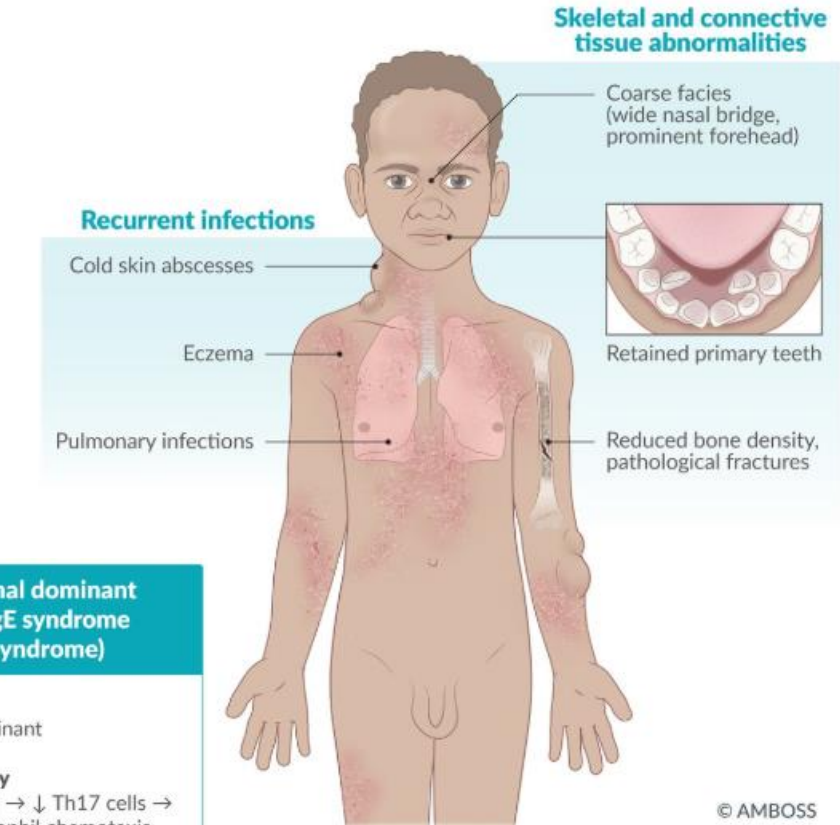
Humoral immunodeficiency syndromes

Condition	B cell count	IgG	IgA	IgM	IgE
CD40 ligand deficiency (hyper-IgM syndrome)	Normal	↓	↓	↑	↓
Common variable immunodeficiency	Normal	↓	↓	↓	↓
Job syndrome (hyper-IgE syndrome)	Normal	Normal	Normal	Normal	↑
Selective IgA deficiency	Normal	Normal	↓	Normal	Normal
X-linked agammaglobulinemia	↓	↓	↓	↓	↓

Autosomal dominant hyperimmunoglobulin E syndrome (Job syndrome) [15]

- **Definition**: defect in neutrophil chemotaxis
- **Etiology**: autosomal dominant; **STAT3 mutation** → ↓ **Th17 cells** → ↓ neutrophil chemotaxis
- **Clinical features**
  - Coarse **F**acies
  - Recurrent, cold **A**bscesses, recurrent bacterial (staphylococcal) infections
  - Retained primary **T**eeth
  - Hyper-Ig**E** (**E**osinophilia)
  - **D**ermatologic (severe eczema)
  - Other features: Decreased bone density increases the risk of bone fractures following minor trauma. [16]
- **Diagnosis**
  - ↑ **IgE**
  - (Variable) **eosinophilia**
  - ↓ **IFN γ**
- **Treatment**
  - Antibiotics and prophylaxis (with penicillinase-resistant antibiotics)
  - IV immunoglobulin therapy

FATED is the acronym for the typical features of **Autosomal dominant hyper-IgE syndrome**: Coarse **F**acies/**F**ractures; **A**bscesses; Retained primary **T**eeth; Hyper-Ig**E**/**E**osinophilia); **D**ermatologic (severe eczema).



Autosomal dominant hyper-IgE syndrome (Job syndrome)

Inheritance
Autosomal dominant

Pathophysiology
STAT3 mutation → ↓ Th17 cells → defective neutrophil chemotaxis

Diagnosis
- ↑ IgE
- Eosinophilia
- ↓ IFN-γ

Treatment
- IV immunoglobulins
- Antibiotics

23) ESBL (extended spectrum beta lactamase) bacteria defining feature is resistance to:

A) Imipenem

B) Meropenem

C) Ceftriaxone

D) Cefuroxime

Answer: C

Extended-spectrum beta-lactamase-producing bacteria (ESBL)

- **Resistance**: Bacteria produce **beta-lactamases** that have a broad spectrum and cleave penicillins, cephalosporins, and, in isolated cases, carbapenems.
- **Pathogens**: particularly gram-negative bacteria (e.g., Enterobacteriaceae such as *Klebsiella* spp., *Escherichia coli*)
- **Diseases**
  - Nosocomial urinary tract infections
  - Health care-associated pneumonia
- **Measures**: isolation in separate rooms required

🧪 Beta-lactamase Types Comparison Table

Feature	ESBL	AmpC	Carbapenemase (e.g., KPC, NDM)
🔍 **Main Resistance**	3rd-gen cephalosporins (e.g., ceftriaxone, ceftazidime)	Cephamycins (e.g., **cefoxitin**, **cefuroxime**) & 3rd-gen cephalosporins	Carbapenems (e.g., **meropenem**, **imipenem**)
💊 **Sensitive to**	**Carbapenems** (main choice), sometimes β-lactam/β-lactamase inhibitors (e.g. piperacillin-tazobactam in mild cases)	**Carbapenems**, **cefepime** (variable), resistant to clavulanate	**Very resistant**; sometimes only sensitive to **polymyxins**, **tigecycline**, **fosfomycin**, **cefiderocol**
🦠 **Detected in**	Mainly **E. coli**, **Klebsiella**	**Enterobacter spp.**, **Serratia**, **Citrobacter**, **Morganella**	**Klebsiella (KPC)**, **E. coli (NDM)**, **Acinetobacter (OXA-48)**
🧪 **Inhibited by clavulanate?**	✅ Yes	❌ No	❌ No
💥 **Clinical Impact**	Common in community & hospital infections	Nosocomial infections, less common in community	Critical threat: often **pan-resistant**, limited treatment options

24) which Schistosoma causes bladder cancer?

A) S. haematobium

B) S. mansoni

C) S. japonicum

Answer: A

Overview of clinical features in schistosomiasis

Subtype	Pathogen	Clinical features

Genitourinary schistosomiasis	• *S. haematobium*	• Hematuria, dysuria
		• Complications (especially with chronic infection)
		  ◦ **Squamous cell carcinoma of the bladder** (may cause painless hematuria)
		  ◦ Infertility (particularly in women)
		  ◦ Bladder neck obstruction and hydronephrosis

Hepatosplenic schistosomiasis	• *S. mansoni* • *S. japonicum* • *S. haematobium* (less common)	• Children and adolescents: **hepatosplenomegaly** • Adults with chronic infection: **periportal fibrosis** and **portal hypertension** • Complications: pulmonary schistosomiasis, neuroschistosomiasis
Intestinal schistosomiasis		• Diarrhea • Abdominal pain • Intestinal bleeding, bowel strictures • Complications (chronic infection): iron deficiency anemia
Pulmonary schistosomiasis		• Pulmonary hypertension and cor pulmonale
Neuroschistosomiasis	• *S. mansoni* • *S. japonicum* • *S. haematobium*	• Headache • Transverse myelitis • Sensory and motor deficits • Epilepsy

13.63 Pathogenesis of schistosomiasis

Time	*Schistosoma haematobium*	*S. mansoni* **and** *S. japonicum*
Cercarial penetration		
Days	Papular dermatitis at site of penetration	As for *S. haematobium*
Larval migration and maturation		
Weeks	Pneumonitis, myositis, hepatitis, fever, 'serum sickness', eosinophilia, seroconversion	As for *S. haematobium*
Early egg deposition		
Months	Cystitis, haematuria	Colitis, granulomatous hepatitis, acute portal hypertension
	Ectopic granulomatous lesions: skin, CNS etc. Immune complex glomerulonephritis	As for *S. haematobium*
Late egg deposition		
Years	Fibrosis and calcification of ureters, bladder: bacterial infection, calculi, hydronephrosis, carcinoma	Colonic polyposis and strictures, periportal fibrosis, portal hypertension
	Pulmonary granulomas and pulmonary hypertension	As for *S. haematobium*

25) Which vaccine of the following is safe to give in pregnancy?

A) Injectable influenza

B) MMR

C) Human Papilloma Virus vaccine

Answer: A

-MMR vaccine is not safe in pregnancy , and After the vaccine , pregnancy is not allowed for 2 months

✓**HPV vaccine** : protect against cancer , not safe in pregnancy

✓ **Influenza vaccine**

Given Annually , from September to may

Indications : elderly , **immunocompromised** , HCW , pregnancy and any person who wants to take it

2 types :

1-Inactivated vaccine : given by I.M injection

-This vaccine is safe in immunocompromised pt and pregnancy

-Composed of 3 or 4 strains of influenza virus :

A(H1) , A (H3) , B (Yamagata) +- B (Victoria)

2-Live attenuated vaccine : given by nasal spray

26) Which test of the following is diagnostic to syphilis?

A) RPR

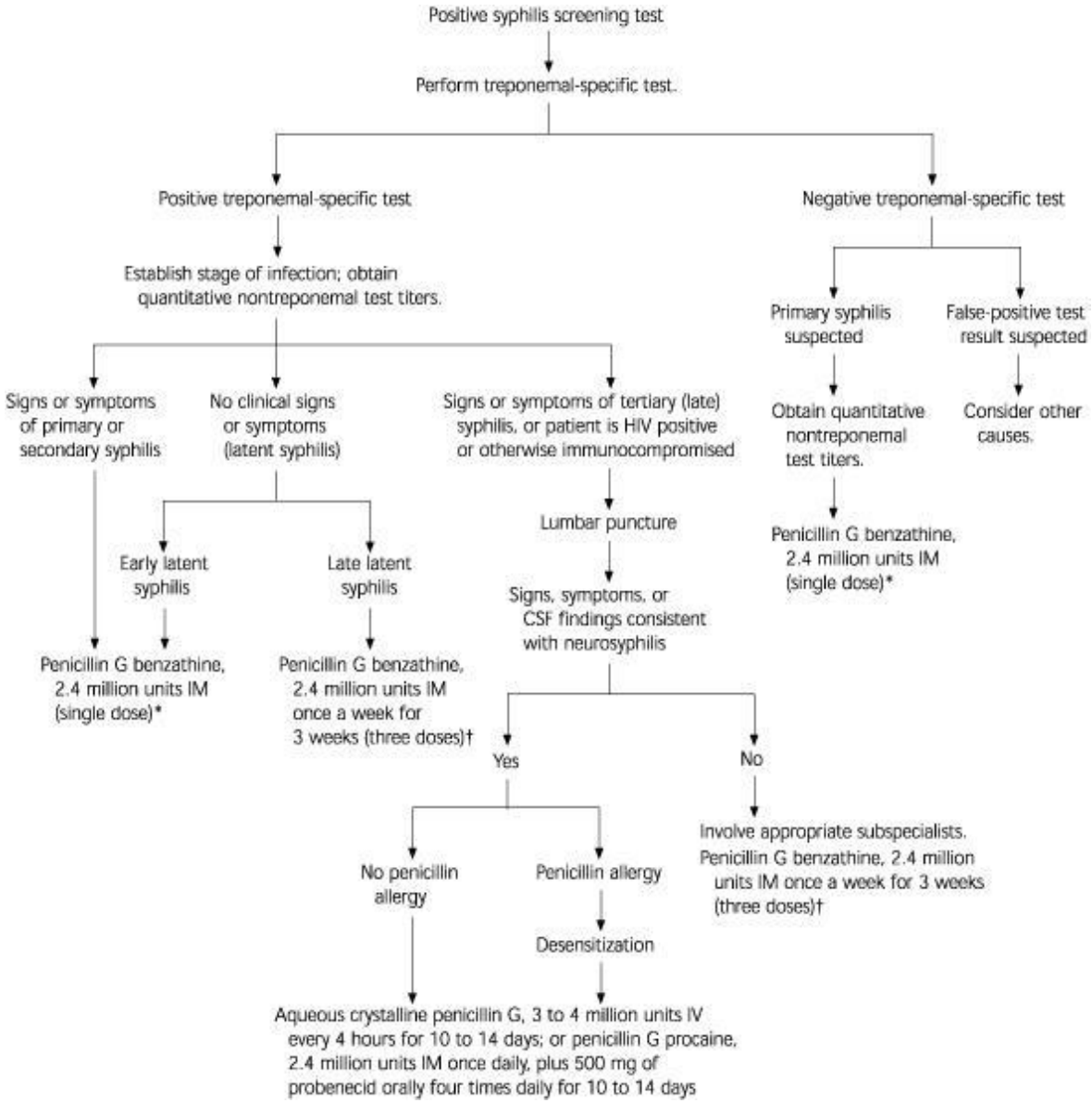
B) VDRL

C) Biopsy

Answer: C

STUDIES

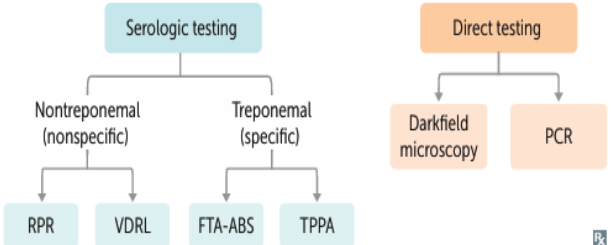
- Labs
  - nonspecific serologic testing ? △△
    - VDRL (venereal disease research laboratory)
      - can test in CSF with neurologic or otologic involvement of syphilis ?
    - RPR (rapid plasma reagent) ? △
  - specific serologic testing
    - FTA-ABS (fluorescent treponemal antibody-absorption)
      - use to confirm diagnosis
- Microscopy
  - dark-field microscopy ?
    - visualize motile spirochetes



Diagnosing syphilis

VDRL and RPR detects nonspecific antibody that reacts with beef cardiolipin. Quantitative, inexpensive, and widely available test for syphilis (sensitive but not specific). Nontreponemal tests (VDRL, RPR) revert to negative after treatment. Direct treponemal test results will remain positive.

False-**P**ositive results on **VDRL** with:
Pregnancy
Viral infection (eg, EBV, hepatitis)
Drugs (eg, chlorpromazine, procainamide)
Rheumatic fever (rare)
Lupus (anticardiolipin antibody) and **L**eprosy



26) MCC of acute endocarditis:

A) S. viridans

B) S. epidermidis

C) E. faecalis

D) S. aureus

Answer: D

Staphylococcus aureus	• Approximately 35–40% of native valve IE cases [3] • Most common cause of **acute** IE, including individuals who inject drugs and patients with prosthetic valves or pacemakers/ICDs [4][5] • Typically affects healthy valves. • Usually **fatal within 6 weeks** if left untreated
Viridans streptococci	• Approximately 20% of native valve IE cases [3] • Most common cause of **subacute IE**, especially in **predamaged native valves** (mainly the mitral valve) • Common cause of IE following **dental procedures**, respiratory tract incision and biopsy • Produce dextrans that facilitate binding of fibrin-platelet aggregates on heart valves
Staphylococcus epidermidis	• Less than 15% of native valve IE cases [3] • Bacteremia from **infected peripheral venous catheters** • Common cause of subacute IE in patients with **prosthetic heart valves**, pacemakers, or ICDs [6]
Enterococci (especially *Enterococcus faecalis*)	• Approximately 10% of native valve IE cases [3] • Multiple drug resistance • Common cause of IE following **nosocomial UTIs** • Causes native and prosthetic valve IE • Following gastrointestinal or genitourinary procedures

27) HVC antibody was positive: what's the best next step?

A) LFT

B) Viral load by PCR

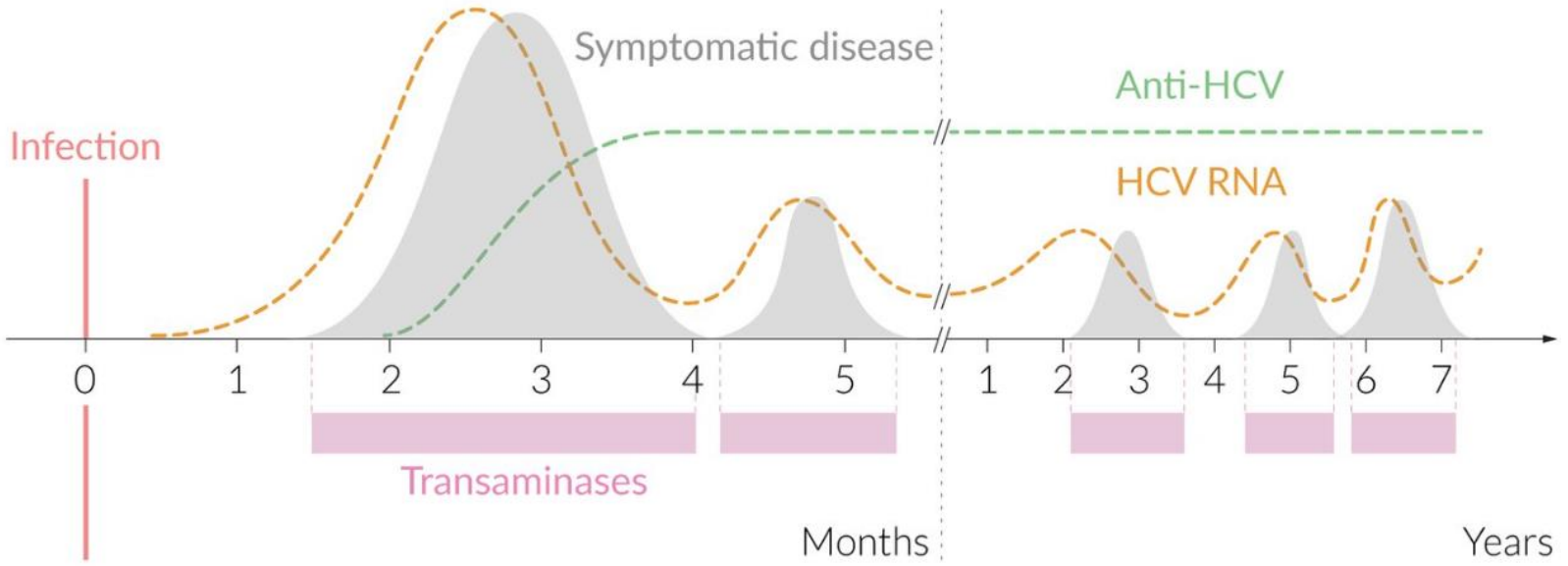
C) Liver biopsy

Answer: B

- A positive HCV antibody only indicates past exposure to the virus.It does NOT distinguish between:Resolved (cleared) infectionOngoing (chronic) infection📌 Therefore, to confirm active infection, you must check:🔬 HCV RNA (PCR) → detects the virus directly

Serology of chronic hepatitis C infection

HCV RNA is continuously detectable throughout chronic hepatitis C infection, with levels peaking at approx. 6 weeks and lower spikes occurring episodically thereafter. Transaminase levels follow the pattern of HCV RNA with a slight delay of approx. 1 week. Antibody production begins at 2 months after infection and plateaus at approx. 4 months, thus not corresponding to HCV RNA and transaminase levels.



28) Patient complaining of perianal itching mainly during night and then he was diagnosed with enterobius vermicularis infection. Which of the following is wrong?

A) It occurs mostly in children

B) It is a pinworm

C) Eggs are invisible in stool

D) Anemia is commonly associated with this infection

Answer: D

- **Enterobius vermicularis** (pinworm)
  - Pinworms are nematodes.
- **Epidemiology** [2]
  - Most common helminthic infection in the U.S.
  - Prevalence in the US: ~ 12%
  - Primarily affects children 5–10 years of age
- **Mode of transmission**
  - Initial infection: fecal-oral
  - Reinfection: digital-oral after scratching anal region
- **Clinical features**
  - **Anal pruritus (especially at night)**
  - **Vulvovaginitis**, especially in children
  - Occasionally, symptoms of intestinal infection (i.e., nausea, vomiting, and abdominal pain which may become severe enough to mimic appendicitis)
- **Diagnosis**
  - **Tape test**: microscopic detection of oval eggs (ova) and/or pinworms on tape that has been pressed against the perianal region
  - Can be an incidental finding on endoscopy

Hookworms (e.g., Ancylostoma duodenale, Necator americanus) are the ones associated with iron deficiency anemia due to blood loss.

29) Which of the following is the diagnostic test for active TB?

A) 3 Sputum samples

B) Chest CT scan

C) Tuberculin skin test

Answer: A

Microbiological studies [7]

Confirmation of the presence of tuberculosis bacilli in different samples is done by direct visualization, positive culture, or by detecting genetic material. Samples used for testing include: [7]

- Sputum samples (most common): Obtain ≥ 3 samples separated by 8 to 24-hour intervals (should include at least one early morning sample). [7][33][34]
- Induced sputum [34]
- Gastric lavage [35]
- Bronchoalveolar lavage
- Extrapulmonary TB suspected: Fluid specimens or tissue samples should be sent for cell count, chemistries, AFB smear microscopy, and NAAT. [7]

Because sputum induction carries a high risk of transmission to health care workers, the procedure must be performed under strict infection control precautions. [36]

30) Which of the following TB infections is the most infectious?

A) CNS

B) Larynx

C) Spine

D) Calcified lung

E) GIT

Answer: B

31) What’s the most common cause of death in patients with brucellosis?

A) Sacroiliitis

B) Endocarditis

C) Osteomyelitis

D) Liver failure

Answer: B

- **Incubation period**: commonly 2–4 weeks (ranges from 5 days to 6 months) [1]
- **General** [2]
  - Flu-like symptoms
  - Night sweats
  - High, potentially **undulant fever**
  - Painful **lymphadenopathy**
  - Hepatomegaly
  - Splenomegaly [2]
- **Localized infection**
  - Arthralgias, low back pain → osteoarticular infection (e.g., osteomyelitis, spondylitis)
  - Epididymal and testicular tenderness, flank pain → genitourinary infection (e.g., epididymo-orchitis, pyelonephritis)
  - Murmurs, friction rubs, tachycardia → cardiac infection (e.g., endocarditis, myocarditis)
  - Additional symptoms may be present as *Brucella* can infect any organ.

Brucellosis in pregnancy can cause spontaneous abortion, preterm labor, and stillbirth. [3]

Brucellosis manifests as **UN**dulant fever and the causative pathogen is transmitted by **UN**pasteurized dairy products.

32) Wrong about Ascaris lumbricoides:

A) Diagnosed by detection of eggs in stool

B) Most common helminth worldwide

C) May cause Loeffler syndrome

D) May cause periorbital edema

Answer: D

- **Epidemiology**: most common helminth infection worldwide (mainly affects children in tropical countries with low standards of hygiene)
- **Mode of transmission**: fecal-oral (infection occurs in the larval state following the consumption of contaminated food, especially raw vegetables that have been contaminated by human waste used as a fertilizer)
- **Life cycle**: Host ingests eggs → Eggs hatch and release larvae → Larvae invade intestinal walls → Larvae migrate to lungs via portal vein → Larvae migrate into alveoli, trachea ("tracheal migration"), and larynx → Larvae are expectorated into the mouth and swallowed back into the intestine → Larvae return to the intestine → Larvae mature into adult worms, which then lay new eggs.
- **Clinical features**
  - Most patients are asymptomatic.
  - Early symptoms
    - Dry cough, blood-tinged sputum, wheezing
    - **Loeffler syndrome**: a transient respiratory disorder characterized by accumulation of eosinophils in the lungs due to certain infections (usually parasites) or allergic reactions to drugs. Symptoms are usually mild and resolve spontaneously

- **Diagnosis**
  - CBC shows **eosinophilia**.
  - **Confirmatory test**: Stool samples show the presence of worms or visible oval eggs with a knobby appearance under the microscope.

Ascaris lumbricoides **(giant roundworm)**	May cause obstruction at ileocecal valve, biliary obstruction, intestinal perforation, migrates from nose/mouth. Migration of larvae to alveoli → Löeffler syndrome (pulmonary eosinophilia).	Fecal-oral; knobby-coated, oval eggs seen in feces under microscope B.	Bendazoles.

33) Wrong about C. difficile:

A) High risk antibiotics are clindamycin, cephalosporins, and fluoroquinolones

B) Causes pseudomembranous colitis

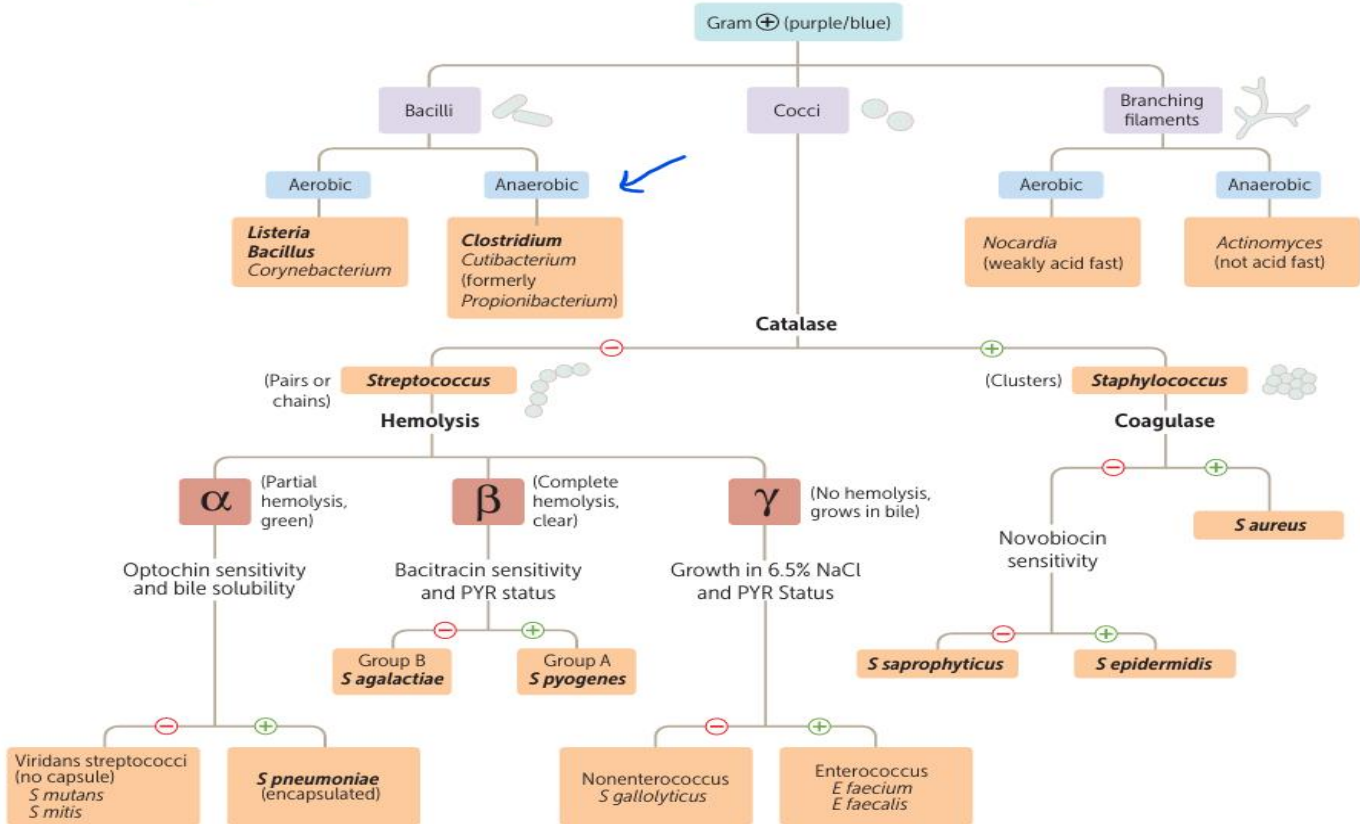
C) It’s a gram-negative bacillus

D) One of the risk factors to develop infection is taking PPIs

E) It can cause toxic megacolon

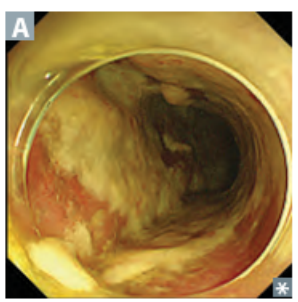
Answer: C

Gram-positive lab algorithm



Important **tests** are in **bold.** Important ***pathogens*** are in ***bold italics.***
Note: Enterococcus is either ˜ - or ° -hemolytic.
PYR, Pyrrolidonyl aminopeptidase.

Clostridioides difficile



Produces toxins A and B, which damage enterocytes. Both toxins lead to watery diarrhea → pseudomembranous colitis A. Often 2° to antibiotic use, especially clindamycin, ampicillin, cephalosporins, fluoroquinolones; associated with PPIs.

Fulminant infection: toxic megacolon, ileus, shock.

Difficile causes diarrhea.

Diagnosed by PCR or antigen detection of one or both toxins in stool.

Treatment: oral vancomycin or fidaxomicin. For recurrent cases, consider repeating prior regimen or fecal microbiota transplant.

34) Peak age of HIV in Jordan:

A) 5-15

B) 15-25

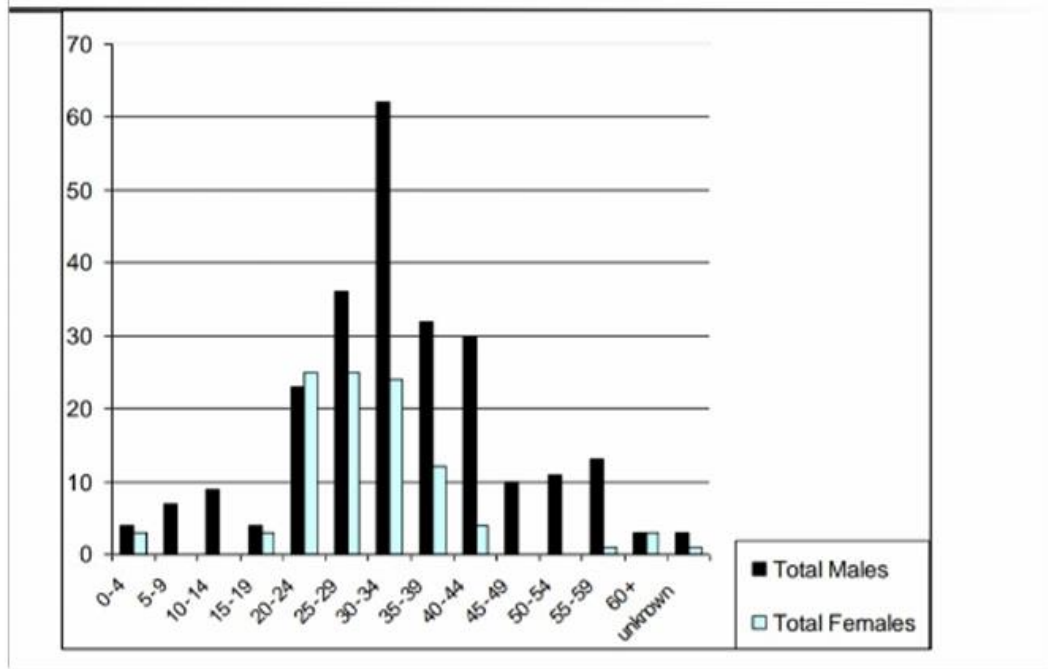
C) 25-35

D) 35-45

E) 45-55

Answer: C

HIV in Jordan



35) Cannot be acquired from unpasteurized milk:

A) Mycobacterium bovis

B) Listeria monocytogenes

C) Brucella

D) Bacillus anthrax

Answer: D

Bacillus anthracis

Gram ⊕, spore-forming rod that produces anthrax toxin, exotoxins consisting of protective antigen, lethal factor (inhibits MAP kinase → macrophage apoptosis), and edema factor (acts as adenylyl cyclase → ↑ intracellular cAMP, upsetting homeostasis → edema, necrosis). Has a polypeptide capsule (poly D-glutamate). Colonies show a halo of projections, sometimes called "medusa head" appearance.

Cutaneous anthrax—painless papule surrounded by vesicles → ulcer with black eschar A (painless, necrotic) → uncommonly progresses to bacteremia and death.

Pulmonary anthrax—inhalation of spores, most commonly from contaminated animals or animal products, although also a potential bioweapon → flulike symptoms that rapidly progress to fever, pulmonary hemorrhage, mediastinitis (CXR may show widened mediastinum), and shock. Also called woolsorter's disease. Prophylaxis with ciprofloxacin or doxycycline when exposed.

Both cutaneous and pulmonary anthrax may be complicated by hemorrhagic meningitis.

- **Transmission**
  - Human infection occurs following exposure to *B. anthracis* or its spores (e.g., inhalation), usually as a result of contact with infected animals or infected animal products (e.g., **wool, hide**, meat).
  - Bioterrorism or biological warfare: exposure to weaponized *B. anthracis* or its spores. An attack using aerosolized anthrax could infect a large number of individuals and cause many casualties, especially if an antibiotic-resistant strain was used.
  - Person-to-person transmission is rare, but cases of person-to-person transmission of cutaneous anthrax have been reported.

> Anthrax infection is an occupational hazard for people who handle livestock and process potentially infected animal materials such as wool or meat.

🧠 Mnemonic for **Unpasteurized Milk Pathogens**:

"Brucella Loves Milk, Might Cause Trouble"

- Brucella
- Listeria
- Mycobacterium bovis
- Campylobacter
- Toxoplasma

Pathogen	Reservoir / Source	Transmission	Key Disease / Notes
Brucella spp.	Cattle, goats, sheep	🥛 Unpasteurized milk, 🐄 direct animal contact	**Brucellosis**: fever, sweats, arthralgia
Listeria monocytogenes	Raw milk, soft cheese	🧀 Unpasteurized dairy, deli meats	**Meningitis** in neonates, elderly
Mycobacterium bovis	Cattle	🥛 Unpasteurized milk	**TB-like disease**
Campylobacter jejuni	Poultry, cattle	🍗 Undercooked meat, unpasteurized milk	**Bloody diarrhea**, GBS risk
Salmonella spp.	Poultry, reptiles	🍳 Raw eggs/meat, 🦎 handling reptiles	Gastroenteritis
E. coli O157:H7	Cattle (intestine)	🥩 Undercooked beef, raw veggies	**HUS**, hemorrhagic colitis
Toxoplasma gondii	🐱 Cats (oocysts in feces)	💩 Cat litter, 🍖 undercooked meat	Dangerous in pregnancy
Bacillus anthracis	Livestock, animal hides	🧴 Skin contact, inhalation, rare ingestion	**Anthrax**: cutaneous, inhalational
Pasteurella multocida	Cats, dogs	🐶 🐱 Animal bites or scratches	Cellulitis, soft tissue infection
Rabies virus	Dogs, bats, raccoons, foxes	🦇 Animal bites (saliva)	Fatal encephalitis if untreated
Leptospira interrogans	Rodents (urine)	🚰 Contaminated water	**Weil's disease** (jaundice, renal failure)
Yersinia pestis	Rodents, fleas	🦟 Flea bites	**Plague** (bubonic, pneumonic)
Coxiella burnetii	Livestock (cattle, sheep, goats)	🐐 Inhalation of aerosols, unpasteurized milk	**Q fever**
Francisella tularensis	Rabbits, ticks	🐇 Contact, ticks, inhalation	**Tularemia**
Hantavirus	Rodents (droppings)	🐭 Inhalation of aerosolized rodent excreta	**Hantavirus pulmonary syndrome**

36) Most common congenital immunodeficiency disorder:

A) Severe combined immunodeficiency

B) Common variable immunodeficiency

C) Bruton agammaglobulinemia

D) IgA immunodeficiency

Answer: D

Selective IgA deficiency (SIgAD) [4][5]

- **Definition**: most common primary immunodeficiency that is characterized by a near or total absence of serum and secretory IgA
- **Epidemiology**: approx. 1:220 to 1:1,000
- **Etiology**: unknown
- **Clinical features**
  - Often **asymptomatic**
  - May manifest with sinusitis or **respiratory infections** (S. pneumoniae, H. influenzae)
  - **Chronic diarrhea**, partially due to elevated susceptibility to parasitic infection (e.g. by Giardia lamblia)
  - Associated with autoimmune diseases (e.g., **gluten-sensitive enteropathy**, inflammatory bowel disease, immune thrombocytopenia) and **atopy**
  - **Anaphylactic reaction** to products containing IgA (e.g., intravenous immunoglobulin)

Disorder	Prevalence	Defect	Clinical Features	Age of Presentation
IgA Immunodeficiency	**Most common** (1 in 300-1,000)	↓ IgA, normal IgG, IgM	Asymptomatic or recurrent **mucosal infections**, allergies, autoimmune diseases	**Childhood** or **early adulthood**
Severe Combined Immunodeficiency (SCID)	**Very rare** (1 in 50,000-100,000)	Defect in **T-cell** and **B-cell** function	**Life-threatening infections**, failure to thrive, no response to vaccines	**Infancy** (first 6 months)
Common Variable Immunodeficiency (CVID)	**Less common** (1 in 25,000-50,000)	Defective **B-cell** differentiation	**Recurrent infections**, **autoimmunity**, **lymphoma** risk	**Adulthood** (20-40 years)
Bruton Agammaglobulinemia	**Rare** (1 in 200,000 males)	**Absence of B-cells** (X-linked)	**Severe bacterial infections**, absent B cells, low IgG/IgA/IgM	**Infancy** (6-9 months, after maternal IgG wanes)
DiGeorge Syndrome (Partial SCID)	**Rare** (1 in 4,000-6,000)	Defect in **T-cell development** (22q11.2 deletion)	**Hypocalcemia**, **recurrent infections**, **cardiac defects**	**Infancy** (early)

37) Which of the following is true about HAV?

A) Viral shed in feces at onset of symptoms

B) It tends to be a chronic infection

C) Its vaccine is safe in pregnancy

D) It causes splenomegaly

Answer: C

Hepatitis A vaccination is considered suitable for use during pregnancy in previously unvaccinated individuals with an increased risk of infection or severe disease. [6]

HAV infection in children is typically asymptomatic. The risk of symptomatic disease increases with age and coinfection (e.g., with hepatitis B).

- **Incubation period**: 2–6 weeks
- **Phases of acute viral hepatitis** [2][4]
  1. Prodromal phase: 1–2 weeks
     - Right upper quadrant pain, **tender hepatomegaly**
     - Fever, malaise
     - Anorexia, nausea, vomiting
  2. Icteric phase: ~ 2 weeks
     - **Jaundice**
     - Dark urine and pale stools
     - Pruritus
  3. Resolution of symptoms
- **Potential complications**: cholestasis, relapsing HAV infection, and autoimmune hepatitis
- **Prognosis** [1]
  - The mortality rate is 0.1–0.3% because few patients progress to acute liver failure.
  - Individuals affected with hepatitis A (unlike with hepatitis B and hepatitis C) do not become carriers nor do they develop chronic hepatitis.

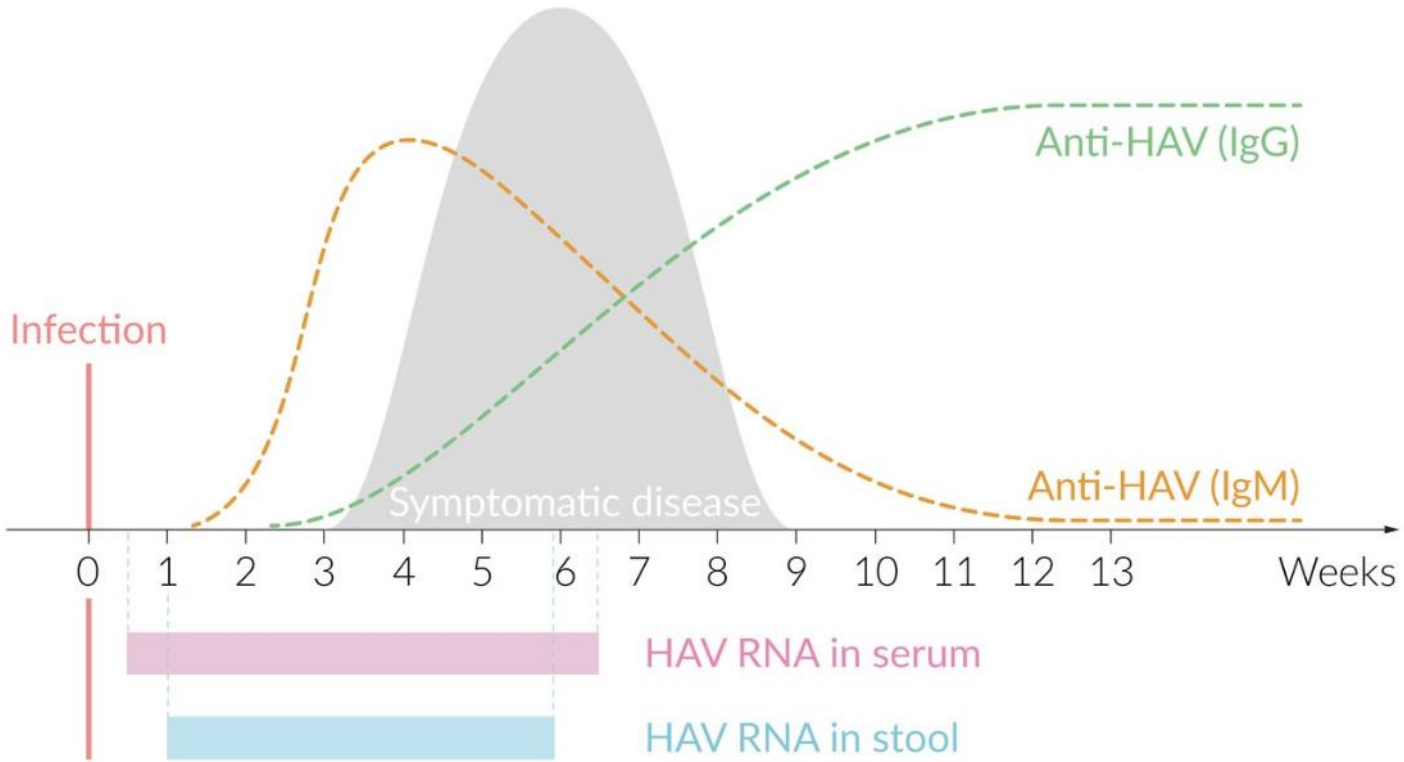
Serology of hepatitis A virus (HAV) infection

Anti-HAV IgM antibodies are detectable ~ 5–10 days after infection (5–10 days before clinical symptoms develop), with peak levels ~ 1 month after infection. Levels typically become undetectable within 3–6 months post infection. Assessing for the presence of anti-HAV IgM antibodies is the standard diagnostic test for active hepatitis A.

During HAV infection, anti-HAV IgG antibodies are typically detectable when clinical symptoms develop and subsequently persist indefinitely. They are also produced in response to vaccination and are a marker of immunity to reinfection.

HAV RNA can be detected in stool and serum samples in patients with hepatitis A. This test is not routinely used but can be helpful during outbreaks, as HAV RNA can be detected as early as the first week after infection.

FEEDBACK



38) Follicular tonsillitis is caused by:

A) GBS

B) GAS

C) Staph aureus

D) S. pneumonia

E) Viridans streptococcus

Answer: B

Streptococcus pyogenes (group A streptococci)

Gram ⊕ cocci in chains A. Group A strep cause:

- Pyogenic—pharyngitis, cellulitis, impetigo ("honey-crusted" lesions), erysipelas
- Toxigenic—scarlet fever, toxic shock–like syndrome, necrotizing fasciitis
- Immunologic—rheumatic fever, glomerulonephritis

Bacitracin sensitive, β-hemolytic, pyrrolidonyl arylamidase (PYR) ⊕. Hyaluronic acid capsule and M protein inhibit phagocytosis. Antibodies to M protein enhance host defenses. Structurally similar to host proteins (ie, myosin); can lead to autoimmunity (ie, carditis seen in acute rheumatic fever).

Diagnose strep pharyngitis via throat swab, which can be tested with an antigen detection assay (rapid, in-office results) or cultured on blood agar (results in 48 hours).

"Ph"yogenes pharyngitis can result in rheumatic "phever" and glomerulonephritis.

Strains causing impetigo can induce glomerulonephritis.

Key virulence factors include DNase, erythrogenic exotoxin, streptokinase, streptolysin O. ASO titer or anti-DNase B antibodies indicate recent *S pyogenes* infection.

Scarlet fever—blanching, sandpaperlike body rash, strawberry tongue, and circumoral pallor in the setting of group A streptococcal pharyngitis (erythrogenic toxin ⊕).

- Head and neck
  - Pharyngitis
  - Tonsillitis
  - Peritonsillar abscess
  - Otitis media

39) Which of the following best describes the starting criteria for antiretroviral therapy in patients with HIV infection?

A) Treatment is started if CD4 count is less than 300 cells/mL

B) Treatment is started if patient is losing weight

C) Treatment is started once patient is diagnosed with HIV

D) Treatment is started if an opportunistic infection appears

E) Treatment is started if viral load is more than 50,000

Answer: C

40) Which of the following vaccines contains live attenuated pathogen?

A) Injectable tetanus vaccine

B) Injectable MMR vaccine

C) Injectable influenza vaccine

D) Injectable hepatitis B vaccine

E) Injectable polysaccharide pneumococcal vaccine

Answer: B

41)A 42-year-old woman presents to the emergency department with right-sided flank pain. She has a history of CKD stage 4 due to ADPKD. The pain has steadily worsened over the last 2 weeks. Associated symptoms are fever, nausea, and vomiting, but no dysuria or hematuria. Physical examination reveals blood pressure of 108/60 mm Hg, heart rate of 98/min, and temperature of 39 degrees, and right costophrenic angle tenderness. Serum creatinine is 2.8 mg/dL (0.6-1.1), which is unchanged from 3 months ago. Urinalysis is unremarkable. Blood cultures are obtained. A computed tomography scan without intravenous contrast reveals multiple fluid-filled cysts in both kidneys, as well as cysts in her liver. Which one of the following is the MOST appropriate treatment?

A) Vancomycin

B) Ciprofloxacin

C) Linezolid

D) Gentamicin

E) Piperacillin

Answer: B

- This clinical scenario is highly suggestive of infected renal cysts in a patient with Autosomal Dominant Polycystic Kidney Disease (ADPKD). Let's break it down:⚠️ Key clues:ADPKD + flank pain, fever, nausea/vomiting
- Urinalysis is unremarkable ➤ argues against pyelonephritis
- No dysuria/hematuria
- CT without contrast shows multiple fluid-filled cysts
- Fever, costovertebral angle tenderness, and stable CKD (creatinine unchanged)
- This constellation points to:🧠 Renal cyst infection — a known complication in ADPKD✅
- Most appropriate treatment:You need an antibiotic that:Penetrates cysts well (lipophilic)Covers gram-negative rods (esp. E. coli)Is safe in CKD🧪
- Best empiric antibiotic choice:✅ Intravenous fluoroquinolone (e.g., ciprofloxacin)Why?Lipophilic ➤ good cyst penetration, Covers gram-negatives (most common cause of cyst infections) ,Can be continued orally once stable

- **Clinical use**
  - Norfloxacin, ciprofloxacin, and ofloxacin
    - Gram-negative rods causing urinary and gastrointestinal infections
    - Some gram-positive pathogens
    - Genitourinary infections caused by **Neisseria gonorrhoeae**, Chlamydia trachomatis, and/or Ureaplasma urealyticum
    - Ciprofloxacin: **Pseudomonas aeruginosa** (e.g., malignant otitis externa)

42) true about tinea:

A) Cysticercosis is caused by tinea saginata

B) Tinea solium is found in pork

C) Tinea saginatua is found in pork

Answer: B

	Intestinal taeniasis	Cysticercosis [20]
Description	• An intestinal infection with **adult** tapeworms that causes mainly GI symptoms	• A tissue infection with tapeworm **larvae**. Symptoms depend on the infected organ (e.g., muscles, brain, skin).
Pathogen	• ***Taenia saginata*** (beef tapeworm) • ***Taenia solium*** (pork tapeworm)	• *Taenia solium* (pork tapeworm)
Mode of transmission	• Ingestion of **larvae (cysticerci)** in raw or undercooked beef/pork	• Fecal-oral: eggs are ingested from contaminated water or vegetables
Life cycle	• Eggs hatch in the human intestine → Develop into adult worms → Produce proglottids which can detach from the tapeworm and are passed in the feces.	

Clinical features	• Often asymptomatic
	• Symptoms caused by adult worms in the intestinal tract: abdominal pain, anorexia, weight loss, nausea, and vomiting
		• Often asymptomatic
		• Symptoms caused by cysticerci accumulation in subcutaneous tissue, muscles, brain, spinal cord, and eyes
		  ◦ Palpable subcutaneous cysts
		  ◦ Myalgia
		  ◦ **Neurocysticercosis** (cysticerci-containing cysts in the CNS): increased intracranial pressure, neurological deficits, seizures
		  ◦ Ocular cysticercosis: eye pain, loss of visual acuity or vision in one eye

Diagnosis	• CBC: eosinophilia [21]
	• Stool examination for eggs or worms [1]
		• CBC: eosinophilia [21]
		• CT and/or MRI brain: multiple unilocular cysts
		  ◦ Early findings: cysts with an invaginated scolex
		  ◦ Late findings: calcified cysts
		• CSF: ↑ protein, ↓ glucose, lymphocytic and/or eosinophilic pleocytosis [22]
		• Serologic testing (e.g., enzyme-linked immunoelectrotransfer blot, ELISA)

Treatment [2]	• **Praziquantel**
	• OR albendazole
		• Requires multidisciplinary collaboration with subspecialists
		• Treatment is complex and may include:
		  ◦ Antiparasitic therapy, e.g., praziquantel, albendazole
		  ◦ Corticosteroids

Prevention [2]	• Avoid raw pork and beef; inspect for cysticerci. • Adequately freeze and cook meat to destroy viable cysticerci. • Dispose of human feces properly. • Wash hands before meal preparation.	

! Cysticercosis can cause brain cysts and seizures.

43) which of the following is NOT a side effect of Metronidazole?

A) Red man syndrome

B) Headache

C) Disulfiram-like reaction

D) Metallic taste

Answer: A

Metronidazole

-metallic taste , headache , disulfiram-like drug(adverse reaction to alcohol leading to nausea, vomiting, flushing, dizziness, throbbing headache, chest and abdominal discomfort, and general hangover-like symptoms)

-after long periods of usage: neurotoxicity🧠 , closure of crohns disease fistula

- Headache
- Fatigue
- Nausea or vomiting
- Dizziness
- Confusion or brain fog
- Light sensitivity
- Muscle aches
- Irritability or mood swings

44) 90% of congenital rubella syndrome occurs if mother get infected in:

A) first trimester

B) Second trimester

C) Third trimester

Answer: A

Congenital rubella syndrome
TORCH fact sheets

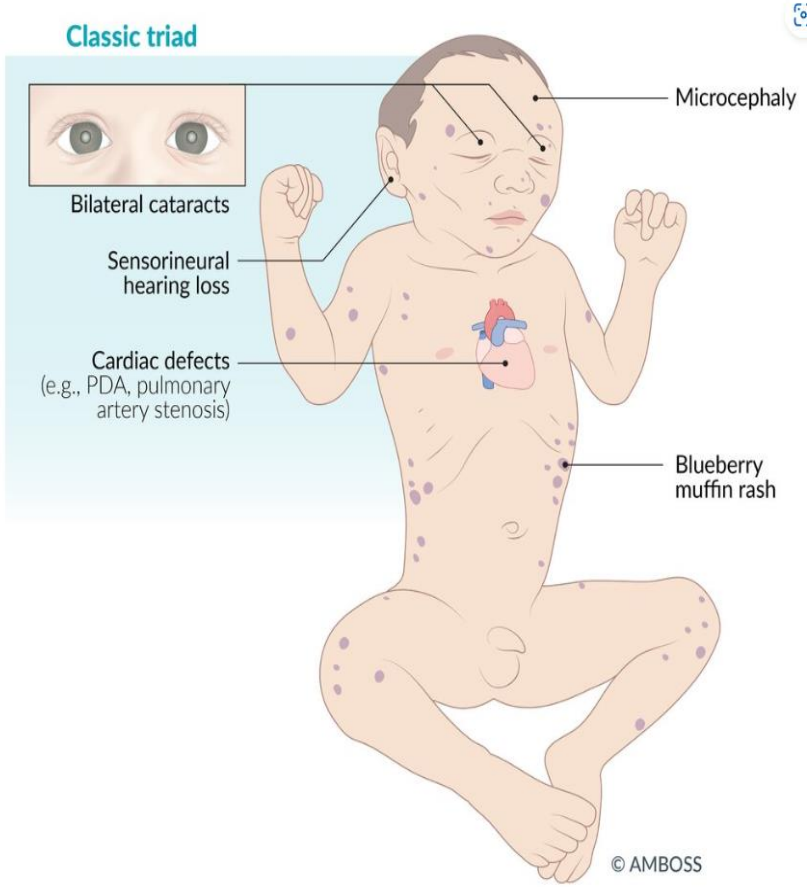
Pathogen
Rubella virus

Transmission
- Mother: airborne
- Fetus: transplacental within first 20 weeks of gestation

Diagnostics
Serological testing, viral culture, PCR

Treatment
Supportive care

Prevention
Immunization before pregnancy



Congenital rubella infection

Abbreviation: CRI

A neonatal rubella infection as a result of intrauterine transmission during the first trimester. Classic triad of defects is sensorineural hearing loss, cataracts, and cardiac defects (e.g., patent ductus arteriosus). Additional features include low birth weight, purpura/petechiae, a blueberry muffin rash, hepatosplenomegaly, osteitis, microcephaly, and other ocular manifestations (e.g., salt and pepper retinopathy, microphthalmos, congenital glaucoma).

45) A CSF sample showed: low glucose, high protein, lymphocytes, the least likely etiology is:

A) TB

B) HSV

C) Sarcoidosis

Answer: B

Cerebrospinal fluid findings meningitis

	OPENING PRESSURE	CELL TYPE	PROTEIN	GLUCOSE
Bacterial	↑	↑ PMNs	↑	↓
Fungal/TB	↑	↑ lymphocytes	↑	↓
Viral	Normal/↑	↑ lymphocytes	Normal/↑	Normal

46) Wrong about chylothorax:

A) TG more than 110

B) Cholesterol more than 200

C) Exudative effusion

Answer: B

Chylothorax is a condition where lymphatic fluid (chyle) accumulates in the pleural space, the area between the lungs and the chest wall. Chyle is a milky, fat-rich fluid that is formed during the digestion and absorption of fats in the small intestine and is carried through the lymphatic system. In chylothorax, this fluid leaks into the pleural cavity, causing an abnormal collection of fluid, known as a pleural effusion.

Key Features of Chylothorax:
The fluid is rich in triglycerides and chylomicrons (fat particles).
The pleural fluid often has a milky appearance, though this can vary.
It is typically classified as an exudative effusion (high protein contet
cholesterol content in chylous fluid is generally <200 mg/dL, and usually much lower, often around <50 mg/dL.

47) Which of the following doesn’t trigger G6PDD hemolysis?

A) Dapsone

B) Nitrofurantoin

C) Levofloxacin

D) TMP-SMZ

Answer: C

47) Which of the following doesn't trigger G6PDD hemolysis?

A) Dapsone

B) Nitrofurantoin

C) Levofloxacin

D) TMP-SMZ

- **Adverse effects**
  - Methemoglobinemia
  - Triggers hemolytic anemia in patients with G6PD deficiency
  - Agranulocytosis
  - GI upset
  - Peripheral neuropathy

- Pulmonary fibrosis (see "Chronic NILD")
- Hemolytic anemia in patients with G6PD deficiency
- GI upset
- Reversible peripheral neuropathy

- **Adverse effects of sulfonamides**
  - Drug interactions due to CYP450 inhibition
  - Displacement of other drugs (e.g., warfarin) from albumin
  - Kernicterus in infancy
  - Nephrotoxicity (especially **acute tubulointerstitial nephritis**) [68]
  - GI upset
  - Hyperkalemia [69]
  - Agranulocytosis
  - Aplastic anemia, thrombocytopenia, and pancytopenia [70]
  - Triggers hemolytic anemia in G6PD-deficient patients
  - Stevens-Johnson syndrome
  - Hypersensitivity reactions (especially urticaria and hives) [71]
  - Photosensitivity
  - Fever

Antibiotics that trigger hemolysis in G6PD
Dapsone ,nitrofurantion , TMP-SMX

Answer: C

48) The percentage of transmitting HIV from the mother to the child is:

A) 5%

B) 10%

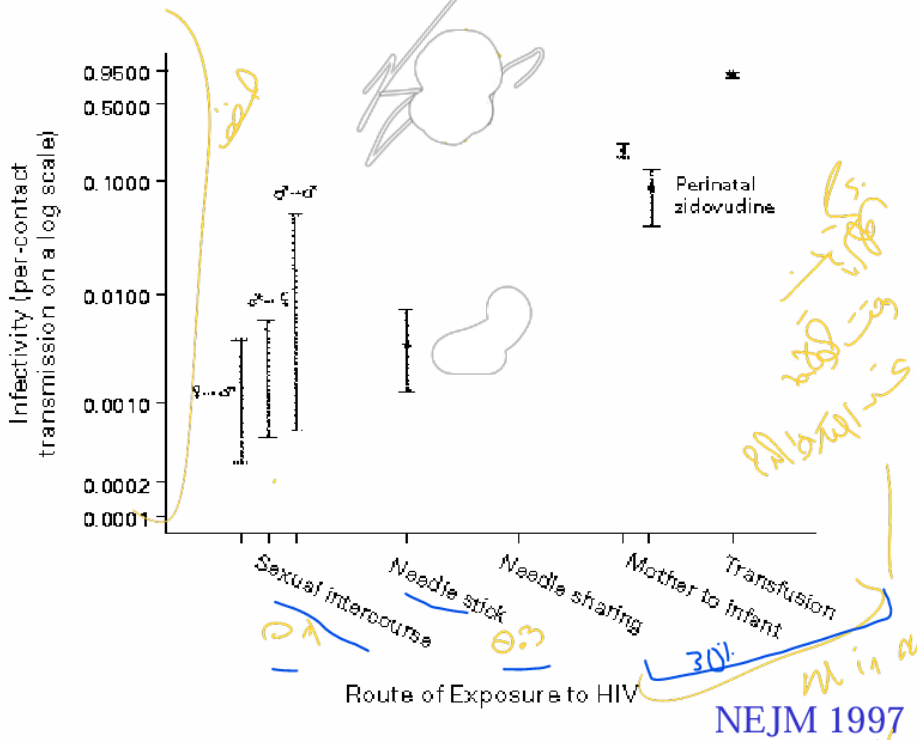
C) 25%

D) 50%

E) 70%

Answer: C

Transmission risk estimates



Without any intervention, the risk of vertical (mother-to-child) transmission of HIV is approximately: 🔺 15–45%, depending on factors like viral load, maternal health, and breastfeeding.Average commonly quoted risk = ~25%This is what the question is referring to. 💉 With proper intervention (ART, safe delivery, no breastfeeding): 🔻 Transmission risk can be reduced to <1–2% 📌 Key Interventions to Reduce Transmission:Antiretroviral therapy (ART) for the mother during pregnancyElective C-section (if high viral load)ART prophylaxis for the newbornAvoid breastfeeding (in resource-rich settings

49) Not in the management of common cold:

A) Antibacterial drug administration

B) Decongestant administration

C) NSAID

D) Hydration

- Symptomatic treatment: hydration, analgesics (e.g., acetaminophen, NSAIDs), and oral and/or topical decongestants (e.g., oxymetazoline, chlorpheniramine) [3][4]
- Antibiotics are not indicated unless a secondary bacterial infection is suspected.

Answer: A

50) TRUE regarding brucellosis:

A) B. canis commonly infects gouts and sheep

B) B. suis is associated with suppurative destructive lesions

C) B. suis is the most common one in humans

D) It’s more common in females

Answer: B

Brucellosis

Brucellosis is an enzootic infection (i.e. endemic in animals) caused by Gram-negative coccobacilli. The four species causing human disease and their animal hosts are: *Brucella melitensis* (goats, sheep and camels in Europe, especially the Mediterranean basin, the Middle East, Africa, India, Central Asia and South America), *B. abortus* (cattle, mainly in Africa, Asia and South America), *B. suis* (pigs in South Asia) and *B. canis* (dogs). *B. melitensis* causes the most severe disease; *B. suis* is often associated with abscess formation.

- *B. melitensis*
  - the most virulent and causes the most severe and acute cases
  - the most prevalent worldwide
- *B. suis*
  - A prolonged course of illness, often associated with suppurative destructive lesions

Brucellosis: Male to Female RatioThe male-to-female ratio for Brucella infection is typically:✅ 2:1 to 3:1📌 Why are males more affected?Occupational exposure:FarmersVeterinariansSlaughterhouse workersLaboratory personnelThese jobs are male-dominated in many regions, leading to higher exposure.🌎 Note:The ratio can vary depending on the country, socioeconomic factors, and gender roles in agricultural work.

51) Which of the following needs only contact isolation?

A) TB

B) MRSA

C) Measles

D) Influenza

Answer: B

Isolation

- **Contact** (gowns, gloves, masks)
  - MRSA
- **Respiratory** (negative pressure room, N95 mask)
  - TB, Measles, VZV
- **Droplet** (surgical mask, private room)
  - Meningitis in the first 24hr, non H1N1 influenza
- **Protective** (private room, mask, gown, gloves)
  - Neutropenic pts

52) Which of the following is NOT an AIDS-defining illness?

A) Kaposi sarcoma

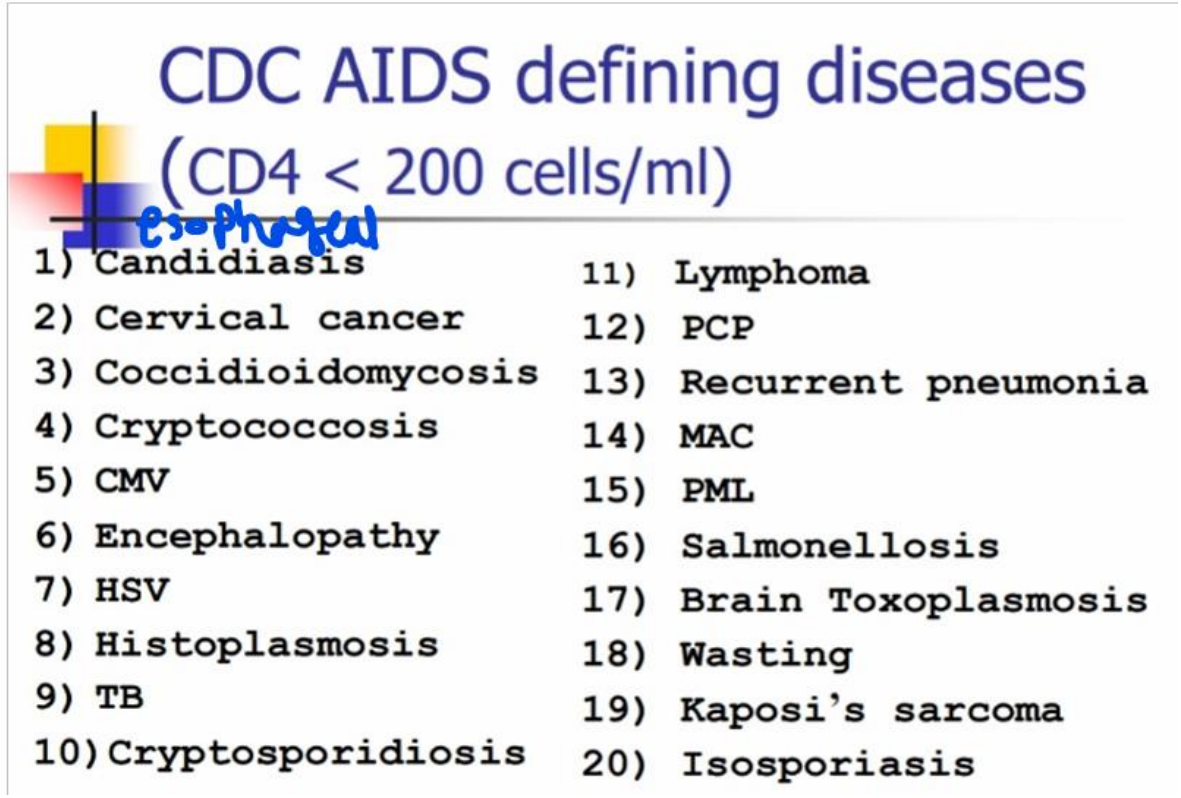
B) cryptosporidiosis

C) Oral candidiasis

D) TB

E) CMV retinitis

Answer: C



According to the CDC AIDS-defining illness criteria, the following forms of candidiasis are considered AIDS-defining:Candidiasis of the esophagusCandidiasis of the bronchi, trachea, or lungs

❌ Not AIDS-defining:Oral thrush (oropharyngeal candidiasis)Common in HIV, but NOT AIDS-definingVaginal candidiasisAlso common but not specific to HIV/AIDS

🧠 Key Point:If a patient with HIV develops esophageal candidiasis, this automatically means:CD4 count is likely <200 cells/mm^3, and the patient has progressed to AIDS

53) What’s the most common cause of diarrhea in adults?

A) Norovirus

B) Rotavirus

C) E. coli

D) Adenovirus

Answer: A

Norovirus

Norovirus is the most common UK cause of infectious gastroenteritis and causes outbreaks in hospital wards, cruise ships and military camps. Food handlers may transmit this virus, which is relatively resistant to decontamination procedures. The incubation period is 24–48 hours. High attack rates and prominent vomiting are characteristic. Diagnosis may be achieved by antigen or DNA detection (PCR) in stool samples, although the characteristic clinical and epidemiological features mean that microbiological confirmation is not always necessary. The virus is highly infectious and cases should be isolated and environmental surfaces cleaned with detergents and disinfected with bleach.

Type of diarrhea	Pathogen	Pathogen characteristics	Associated disorders
Watery diarrhea	• Enterotoxigenic *Escherichia coli*	• Heat-labile toxin • Heat-stable toxin	• Traveler's diarrhea
	• *Clostridioides difficile*	• Toxin A (enterotoxin) • Toxin B (cytotoxin) • Associated with antibiotic and PPI use	• Pseudomembranous colitis • Rarely causes bloody diarrhea
	• *Clostridium perfringens*	• Heat-labile enterotoxin • Clostridium perfringens alpha toxin	• Gas gangrene
	• *Vibrio cholerae*	• Straight or curved (comma-shaped) • Cholera toxin (enterotoxin): "rice water" diarrhea • Transmission via contaminated water or uncooked seafood (e.g., raw shellfish)	• Cholera
	• Norovirus (most common cause)	• Fecal-oral or airborne transmission	
	• Viruses	• Rotavirus	• Fecal-oral transmission • Prevention: attenuated vaccine for children	• Gastroenteritis
		• Adenovirus	• Transmission via contaminated water or fecal-oral route	
	• Protozoa	• *Giardia lamblia*	• Transmission via ingestion of contaminated water (e.g., lakes, rivers, ponds, swimming pools) • Most commonly affects hikers or campers	• Giardiasis
		• *Cryptosporidia*	• Fecal-oral transmission (oocysts are typically excreted in stool and contaminate drinking water)	• Cryptosporidiosis • Immunocompromised individuals: potentially life-threatening protracted diarrhea and/or biliary tract infections (e.g., cholangitis, cholecystitis)
	• *E.coli*	• Enteroinvasive *E. coli*	• Direct invasion of the intestinal epithelium and formation of enterotoxins	• Gastroenteritis

Bloody diarrhea	• Enterohemorrhagic *E. coli*	• Shiga toxin • Most common serotype: **(O157:H7)**	• **Hemolytic uremic syndrome**
	• *Campylobacter jejuni*	• Curved or spiral-shaped with polar flagellum • Grows best at 37–42°C	• Campylobacter enteritis (especially in children) • Commonly precedes reactive arthritis and Guillain-Barré syndrome
	• Nontyphoidal *Salmonella*	• No lactose fermentation • Flagellar motility • Hosts: humans, animals, and animal products (e.g., reptiles, **poultry**, pets, **eggs**)	• Salmonellosis
	• *Shigella*	• Slow/absent lactose fermentation • Shiga toxin • Low infectious dose required (low ID_{50}) • Humans are the only host.	• Bacillary dysentery
	• *Yersinia enterocolitica*	• Reservoir: contaminated pork and milk products	• Yersiniosis (outbreaks often occur in day-care settings) • May manifest as pseudoappendicitis • Reactive arthritis
	• Protozoa: *Entamoeba histolytica*	• Fecal-oral transmission • Amebic cysts are excreted in stool and can contaminate drinking water or food.	• Amebic dysentery • Amebic liver abscess

54) Which of the following causes erysipelas?

A) Exotoxin of S. aureus

B) GBS

C) GAS

D) P. aeruginosa

Answer: C

Streptococcus pyogenes (group A streptococci)

Gram ⊕ cocci in chains A. Group A strep cause:

- Pyogenic—pharyngitis, cellulitis, impetigo ("honey-crusted" lesions), erysipelas
- Toxigenic—scarlet fever, toxic shock–like syndrome, necrotizing fasciitis
- Immunologic—rheumatic fever, glomerulonephritis

Bacitracin sensitive, β-hemolytic, pyrrolidonyl arylamidase (PYR) ⊕. Hyaluronic acid capsule and M protein inhibit phagocytosis. Antibodies to M protein enhance host defenses. Structurally similar to host proteins (ie, myosin); can lead to autoimmunity (ie, carditis seen in acute rheumatic fever).

Diagnose strep pharyngitis via throat swab, which can be tested with an antigen detection assay (rapid, in-office results) or cultured on blood agar (results in 48 hours).

- **Erysipelas**: superficial skin infection involving the **upper dermis**
- **Cellulitis**: local infection of the **deep dermis and subcutaneous tissue**

Etiology [3][4]

- Beta-hemolytic streptococci: mostly group A Streptococcus (S. pyogenes)
- Less common pathogens for cellulitis
  - S. aureus
  - Pasteurella multocida (gram-negative, encapsulated coccobacillus): secondary to dog and cat bites

GAS is the most common cause of nonpurulent skin and soft tissue infections (i.e., erysipelas, cellulitis).

55) 70-year-old patient started complaining of cough, SOB and weakness of 3 days duration. He was suspected to have been infection with H1N1 infleunza A strain. All of the following are applicable EXCEPT?

A) He should be given oseltamivir

B) He should be started on prophylactic antibiotics

C) His household contacts should be started on oseltamivir

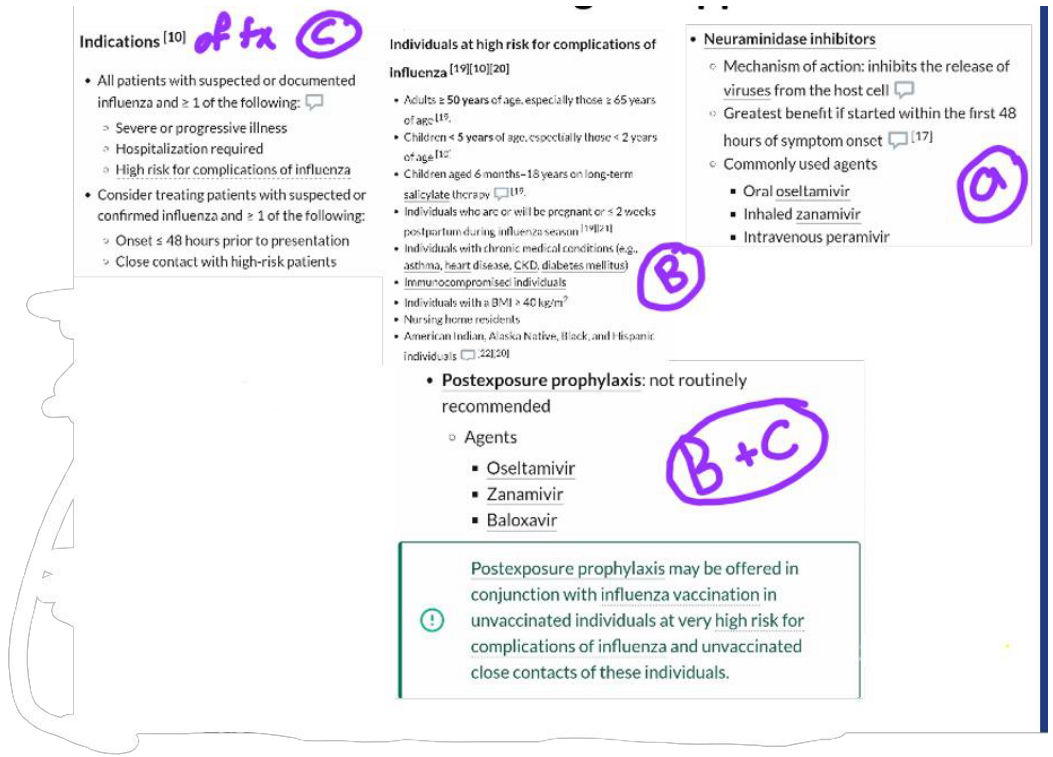
D) H1N1 diagnosis can be confirmed with nasopharyngeal swab PCR

Answer: A

Oseltamivir
Zanamivir
Peramivir
	• **Neuraminidase inhibitor**: inhibition of progeny release from the surface of infected host cells	• Treatment of influenza A and B (reduces symptom duration if taken within 1–2 days of symptom onset)
		• Prophylaxis of influenza in adults and pediatric patients ≥1 year (oseltamivir) and ≥ 5 years (zanamivir) of age
			• Pulmonary: upper respiratory tract infections
			• Gastrointestinal
			  ◦ Nausea
			  ◦ Vomiting
			• Other: headache

Oseltamivir

A neuraminidase inhibitor used in the prophylaxis and treatment of influenza A and B. Inhibits viral budding and prevents dissemination of the virus into the bloodstream.



56) Man went to India and now has bloody diarrhea; all of these are possible etiologies EXCEPT:

A) Shigella

B) Salmonella

C) Cholera

D) Campylobacter

Answer: C

Bloody diarrhea	• *Campylobacter jejuni*	• Curved or spiral-shaped with polar flagellum • Grows best at 37–42°C	• Campylobacter enteritis (especially in children) • Commonly precedes reactive arthritis and Guillain-Barré syndrome
	• Nontyphoidal *Salmonella*	• No lactose fermentation • Flagellar motility • Hosts: humans, animals, and animal products (e.g., reptiles, **poultry**, pets, **eggs**)	• Salmonellosis
	• *Shigella*	• Slow/absent lactose fermentation • Shiga toxin • Low infectious dose required (low ID_{50}) • Humans are the only host.	• Bacillary dysentery
	• *Yersinia enterocolitica*	• Reservoir: contaminated pork and milk products	• Yersiniosis (outbreaks often occur in day-care settings) • May manifest as pseudoappendicitis • Reactive arthritis
	• Protozoa: *Entamoeba histolytica*	• Fecal-oral transmission • Amebic cysts are excreted in stool and can contaminate drinking water or food.	• Amebic dysentery • Amebic liver abscess

The stool is of almost liquid consistency and resembles water with a white, opaque appearance, hence the term "rice-water" stools. These stools may occur up to 20–30 times per day.

57) Which of the following antibiotics causes tendinitis in the rotator cuff muscles?

A) Ciprofloxacin

B) Doxycycline

C) Sulfatrim

D) Ampicillin

fluoroquinolone

Levofloxcacine : teratogenic , only > 18 y , athrragia and alteration the bone growth , tendon tearing , joint swelling

Ciprofloxacin : tendinitis

Answer: A

58) Common variable immune deficiency, which is true?

A) Recurrent infections in childhood

B) Low IgA and IgG

C) Decreased B lymphocytes

Answer: B

Common variable immune deficiency

Common variable immune deficiency (CVID) is characterised by low serum IgG levels and failure to make antibody responses to exogenous pathogens. It is a heterogeneous adult-onset primary immune deficiency, the underlying cause is unknown in most cases, although genetic mutations have been identified in a minority of patients. The presentation is with recurrent infections, and bronchiectasis is a recognised complication. Paradoxically, antibody-mediated autoimmune diseases, such as idiopathic thrombocytopenic purpura and autoimmune haemolytic anaemia, are common in CVID. It is also associated with an increased risk of malignancy, particularly lymphoproliferative disease.

59) Most common cause of viral encephalitis:

A) HSV

B) CMV

C) VZV

D) EBV

E) West Nile virus

Answer: A

Primary HSV-2 can cause meningitis or transverse myelitis. HSV is the leading cause of sporadic viral encephalitis; this follows either primary or secondary disease, usually with HSV-1. A haemorrhagic necrotising temporal lobe cerebritis produces temporal lobe epilepsy and altered consciousness/coma. Without treatment, mortality is 80%. HSV is also implicated in the pathogenesis of Bell's palsy with a lower motor neuron 7th nerve palsy, although antivirals have not been demonstrated to improve outcome.

60) Which of the following is an AIDS-defining disease?

A) CD4 less than 300

B) Viral load more than 10000

C) TB

D) VZV

Answer: C

61) What is the risk of being infected with HIV after needle stick injury?

A) 0.3 %

B) 3%

C) 30%

Answer: A

Rule of 3: risk of infection after a needle stick injury: HIV: 0.3%, HCV: 3%, HBV: 30%.

62) Not a side effect of vancomycin:

A Red man

B) Phlebitis

C) Renal toxicity

D) Seizures

Answer: D

63) A case of infective endocarditis, patient 45 y/o, healthy, she did a root extraction at dentist clinic, started to have new murmur, which is the most likely organism:

A) Staph aureus

B) Alpha hemolytic strep

C) E. coli

D) Bacteroides

E) Staph epidermidis

Answer: B

Staphylococcus aureus	• Approximately 35–40% of native valve IE cases [3] • Most common cause of **acute** IE, including individuals who inject drugs and patients with prosthetic valves or pacemakers/ICDs [4][5] • Typically affects healthy valves. • Usually **fatal within 6 weeks** if left untreated
Viridans streptococci	• Approximately 20% of native valve IE cases [3] • Most common cause of **subacute IE**, especially in **predamaged native valves** (mainly the mitral valve) • Common cause of IE following **dental procedures**, respiratory tract incision and biopsy • Produce dextrans that facilitate binding of fibrin-platelet aggregates on heart valves
Staphylococcus epidermidis	• Less than 15% of native valve IE cases [3] • Bacteremia from **infected peripheral venous catheters** • Common cause of subacute IE in patients with **prosthetic heart valves**, pacemakers, or ICDs [6]
Enterococci (especially *Enterococcus faecalis*)	• Approximately 10% of native valve IE cases [3] • Multiple drug resistance • Common cause of IE following **nosocomial UTIs** • Causes native and prosthetic valve IE • Following gastrointestinal or genitourinary procedures

64) A patient with VZV shingles, which is wrong?

A) Observe

B) Give ganciclovir

C) Give acyclovir

D) Give levofloxacin

E) Do HIV test if it was bilateral (in immunocompromised)

Answer: D (Abx)

65) About amoeba histolytica found in feces, whish of the following is NOT true?

A) Treatment for 7-10 days

B) Elevated alkaline phosphatase means liver abscess

C) Blood comes from colon ulcers

D) Metronidazole is the treatment of choice

Answer: B

Management

Intestinal and early hepatic amoebiasis responds quickly to oral metronidazole (800 mg 3 times daily for 5–10 days) or other long-acting nitroimidazoles like tinidazole or ornidazole (both in doses of 2 g daily for 3 days). Nitazoxanide (500 mg twice daily for 3 days) is an alternative drug. Either diloxanide furoate or paromomycin, in doses of 500 mg orally 3 times daily for 10 days after treatment, should be given to eliminate luminal cysts.

Pathology

Cysts of *E. histolytica* are ingested in water or uncooked foods contaminated by human faeces. Infection may also be acquired through anal/oral sexual practices. Trophozoites emerge from the cysts in the small bowel and enter the large bowel. The parasite invades the mucous membrane of the large bowel, producing lesions that are maximal in the caecum but extend to the anal canal. These are flask-shaped ulcers, varying greatly in size and surrounded by healthy mucosa. A rare complication is amoeboma, a localised granuloma that may present as a palpable abdominal mass (usually in the right iliac fossa), a rectal mass (rarely) or a filling defect on colonic radiography. This has to be distinguished from other causes of colonic mass (*e.g.* cancer). Amoebic ulcers may cause severe haemorrhage but rarely perforate the bowel wall.

An amoebic abscess of the liver is suspected on clinical grounds; there is often a neutrophil leucocytosis and a raised right hemidiaphragm on chest X-ray. Confirmation is by ultrasonic scanning. Aspirated pus from an amoebic abscess has the characteristic chocolate-brown appearance but rarely contains free amoebae (Fig. 13.49B).

A)treatment for 7–10 days ✅ True – Metronidazole is typically given for 7–10 days, followed by a luminal agent like paromomycin or iodoquinol. This is standard.B) Elevated alkaline phosphatase means liver abscess ❌ This is the false one — This statement is NOT always true.While ALP can be elevated in amoebic liver abscess, it's not specific or diagnostic.Other liver conditions (e.g., cholestasis, hepatitis, biliary disease) also raise ALP.Some patients with liver abscess may even have normal ALP.So, saying "elevated ALP means liver abscess" is an overgeneralization — hence, not true.C) Blood comes from colon ulcers ✅ True – Flask-shaped ulcers in colon → cause bloody diarrheaD) Metronidazole is the treatment of choice ✅ True – It targets the trophozoite form in tissue.

66) All of the following indicate SIRS EXCEPT:

A) RR 23

B) WBC 10000

C) Temp 39

D) Bands 13%

Answer: B

- SIRS is diagnosed if ≥ 2 of the following 4 crite
  are fulfilled:
  - Temperature: > 38°C or < 36°C
  - Heart rate: > 90/min
  - Respiratory rate: > 20/min or $PaCO_2$ < 32 mm Hg
  - White blood cell count: > 12,000/mm^3, < 4000/mm^3, and/or > 10% band cells

67) AII true about C. difficile EXCEPT:

A) Most antibiotic-induced diarrhea are not caused by CD

B) Most cases of pseudo membranous colitis are caused by CD

C) May be found in healthy people

D) Immune complex mediated

E) Metronidazole is DOC

Answer: D

- The question seems wrong
- But this is ChatGPT interpretation
- A) Most antibiotic-induced diarrhea are not caused by CD ✅ TrueOnly a small percentage of antibiotic-associated diarrhea is due to C. difficileMany are mild and non-C. diff, caused by gut flora imbalanceB) Most cases of pseudomembranous colitis are caused by CD ✅ TrueC. difficile is the main cause of pseudomembranous colitisC) May be found in healthy people ✅ TrueAsymptomatic colonization is common, especially in infants and hospitalized adultsD) Immune complex mediated ❌ ❌ False – This is the EXCEPTIONC. difficile causes disease via toxins (A and B), not immune complexesIt leads to direct cytotoxicity and inflammation of the colonic mucosaE) Metronidazole is DOC ✅ True (historically)Metronidazole was the first-line drug, especially for mild to moderate casesNow, oral vancomycin or fidaxomicin is preferred in many guidelines, but metronidazole is still effective

68) AII true about staph. Aureus food poisoning EXCEPT:

A) Fever

B) Nausea and vomiting

C) Diarrhea in less than 24 Hours

D) Abdominal cramping

Answer: A

- **Onset after ingestion**: typically has a short latency period of 1–6 hours [25]
- **Duration**: 24–48 hours [7]
- **Clinical features**
  - Severe vomiting (often with sudden onset)
  - Abdominal cramping
  - Diarrhea

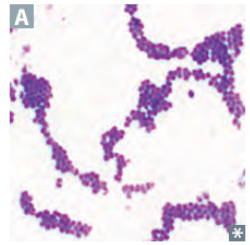
Staphylococcal food poisoning

Staph. aureus is transmitted via the hands of food handlers to foodstuffs such as dairy products, including cheese, and cooked meats. Inappropriate storage of these foods allows growth of the organism and production of one or more heat-stable enterotoxins.

Nausea and profuse vomiting develop within 1–6 hours. Diarrhoea may not be marked. The toxins that cause the syndrome act as 'superantigens' and induce a significant neutrophil leucocytosis that may be clinically misleading. Most cases settle rapidly but severe dehydration can occasionally be life-threatening.

Antiemetics and appropriate fluid replacement are the mainstays of treatment. Suspect food should be cultured for staphylococci and demonstration of toxin production. Public health authorities should be notified if food vending is involved.

Staphylococcus aureus



Gram ⊕, β-hemolytic, catalase ⊕, coagulase ⊕ cocci in clusters A. Protein A (virulence factor) binds Fc-IgG, inhibiting complement activation and phagocytosis. Commonly colonizes the nares, ears, axilla, and groin.

Causes:

- Inflammatory disease—skin infections, organ abscesses, pneumonia (often after influenza virus infection), infective endocarditis, septic arthritis, and osteomyelitis.
- Toxin-mediated disease—toxic shock syndrome (TSST-1), scalded skin syndrome (exfoliative toxin), rapid-onset food poisoning (enterotoxins).

MRSA (methicillin-resistant *S aureus*)—important cause of serious healthcare-associated and community-acquired infections. Resistance due to altered penicillin-binding proteins (conferred by *mec*A gene). Some strains release Panton-Valentine leukocidin (PVL), which kills leukocytes and causes tissue necrosis.

TSST-1 is a superantigen that binds to MHC II and T-cell receptor, resulting in polyclonal T-cell activation and cytokine release.

Staphylococcal toxic shock syndrome (TSS)—fever, vomiting, diarrhea, rash, desquamation, shock, end-organ failure. TSS results in ↑ AST, ↑ ALT, ↑ bilirubin. Associated with prolonged use of vaginal tampons or nasal packing.

Compare with *Streptococcus pyogenes* TSS (a toxic shock–like syndrome associated with painful skin infection).

S aureus food poisoning due to ingestion of preformed toxin → short incubation period (2–6 hr) followed by nonbloody diarrhea and emesis. Enterotoxin is heat stable → not destroyed by cooking.

S aureus makes coagulase and toxins. Forms fibrin clot around itself → abscess.

69) Which of the following may cause lupus?

A) Isoniazid

B) Rifampicin

C) Pyrazinamide

D) Ethambutol

E) Streptomycin

Answer: A

- **Description**: lupus-like symptoms triggered by medication
- **Epidemiology**
  - ♂ = ♀
  - DILE accounts for ~ 10% of all SLE cases.
  - Most common in white populations
  - Most common in individuals 50–70 years of age
- **Etiology**
  - Genetic susceptibility
    - Presence of a genetic mutation that causes decreased acetyltransferase activity, which results in the slow acetylation of drugs
    - Presence of HLA-DR2, HLA-DR3, HLA-DR4, or an unexpressed C4 complement allele
  - Drug triggers [23]
    - High risk: **procainamide and hydralazine**
    - Low risk: **sulfa drugs** and certain nonsulfa drugs, (e.g., isoniazid, methyldopa, minocycline, phenytoin, TNF-α inhibitors)
- **Clinical features** (usually manifest ≥ 1 month after medication initiation)
  - **Constitutional**: fatigue, fever, and weight loss
  - **Musculoskeletal**: myalgia and symmetrical polyarthralgia
  - Skin lesions (e.g., malar rash)
  - Serositis
- **Diagnostics** [9][23]
  - ANAs are positive in nearly all patients.
  - **Antihistone antibodies**
    - Antihistone antibodies are seen in 90–95% of patients.
    - Nonspecific: They may also be present in ~ 75% of patients with SLE.
  - Anti-dsDNA antibodies: uncommon in patients with DILE
- **Treatment**
  - Stop the triggering drug.
  - If necessary, start temporary pharmacotherapy (see the “Treatment” section).
- **Prognosis**: Most cases resolve within a few weeks after the causative medication has been discontinued.

“My Two **HIPS**”: **M**ethyldopa/**M**inocycline, **T**NF-α inhibitors, **H**ydralazine, **I**soniazid, **P**rocainamide/**P**henytoin, and **S**ulfa drugs are triggers for DILE.

DILE can manifest with various features that are also seen in idiopathic SLE (e.g., fever, arthritis, malar rash, serositis) but typically does not affect the CNS or kidneys, unlike SLE.

70) A patient susceptible to parasitic infections, mostly due to:

A) B cell deficiency

B) T cell deficiency

Answer: B

Primary T-lymphocyte deficiencies

These are a group of diseases characterised by recurrent viral, proto zoal and fungal infections (see Box 4.5). Many T-cell deficiencies are als associated with defective antibody production because of the impo tance of T cells in providing help for B cells. These disorders generall present in childhood. Several causes of T-cell deficiency are recognisec These are summarised in Figure 4.12 and discussed in more detail belov

Primary antibody deficiencies

Primary antibody deficiencies occur as the result of abnormalities in B-cell function, as summarised in Figure 4.11. They are characterised by recurrent bacterial infections, particularly of the respiratory and gastrointestinal tract. The most common causative organisms are encapsulated bacteria such as *Streptococcus pneumoniae* and *H. influenzae*. These disorders usually present in infancy, when the protective benefit of placental transfer of maternal immunoglobulin has waned. The most important causes are discussed in more detail below.

71) Which of the following is true about brucella?

A. brucella abortis is the most virulent species

B. commonly transmitted from human to human

C. G+ bacilli

D. should be treated with antibiotics for several weeks

E. people who work with animals should have brucella vaccine

Answer: D

- A) Brucella abortus is the most virulent speciesIncorrectBrucella melitensis (from goats/sheep) is the most virulent and most commonly infects humansB. abortus (from cattle) is less virulent ❌ B) Commonly transmitted from human to humanIncorrectHuman-to-human transmission is extremely rareBrucella is mainly transmitted via:Unpasteurized dairyDirect contact with infected animals or secretionsInhalation in labs ❌ C) G+ bacilliIncorrectBrucella is a Gram-negative coccobacillus, not G+ bacilli ✅ D) Should be treated with antibiotics for several weeksCorrect!Brucella is an intracellular pathogen, requiring:Doxycycline + rifampin (or streptomycin)For at least 6 weeksShorter treatment increases risk of relapse ❌ E) People who work with animals should have Brucella vaccineIncorrectThere is no licensed Brucella vaccine for humansVaccines exist for animals (e.g., livestock), not people

72) The risk of HCV infection after a needle stick injury:

A. 0.3%

B. 3%

C. 30%

Answer: 3%

73) not a side effect of vancomycin:

A. red man syndrome

B. neutropenia

C. phlebitis

D. seizures

E. nephrotoxicity

Answer: D

74) not an HIV defining illness:

A. kaposi sarcoma

B. TB

C. CMV retinitis

D. Herpes zoster

Answer: D

75) patient presented with abdominal discomfort, has 4 bowel movements of loose stool with no blood, no fever, his brother had similar symptoms 2 days ago and symptoms have resolved.. which is the most likely organism?

A. rota

B. strep

C. s. aureus

D. Norovirus

Answer: D

76) which is a mismatch?

A. Chlamydia … bats

B. salmonella enteritidis … chicken

C. Pasteurella … cats

D. cryptococcus neoformans … pigeons

E. brucella canis … dogs

Answer: A

Pathogen	Animal Reservoir	Notes
Brucella melitensis	Goats & sheep	Most virulent Brucella species
Brucella abortus	Cattle	Less virulent
Brucella suis	Pigs	Chronic brucellosis
Brucella canis	Dogs	Rare but zoonotic
Pasteurella multocida	Cats & dogs	Cat bite infections
Salmonella enteritidis	Poultry (chickens, eggs)	Common cause of food poisoning
Cryptococcus neoformans	Pigeons (droppings)	Fungal meningitis in immunocompromised
Chlamydia psittaci	Parrots & other birds	Psittacosis (atypical pneumonia)
Leptospira interrogans	Rodents (especially rats)	Spread through urine-contaminated water
Yersinia pestis	Rodents (via fleas)	Plague
Rabies virus	Bats, dogs, raccoons, foxes	Neurotropic virus — post-exposure prophylaxis vital
Hantavirus	Deer mice & other rodents	Pulmonary syndrome, spread via inhaled aerosolized urine
Bacillus anthracis	Livestock (cattle, sheep)	Spores in soil and animal hides
Toxoplasma gondii	Cats (definitive host)	Risky in pregnancy or immunocompromised

77) Most sensitive sample to be tested by PCR for COVID is:

A. sputum

B. nasopharyngeal swab

C. anal swab

Answer: B

78) Which of the following is true regarding TB:

A. Gram positive baclli

B. Intracellular organism

C. Mininal time of treatment is of 9 months……should be 6 months

Answer: B

Questions without choices

1) Patient testing for HIV after 7 days from intercourse with HIV infected patient, best tool:

PCR testing for viral load

2) Most sensitive test for typhoid fever:

In the past paper file, it's blood culture but the true answer is bone marrow culture

3) Immediate action after needle stick injury?

wash your hands with water and soap

4) Needle stick injury with Hep B in an individual not previously vaccinated, what to do?

give the vaccine and Hep B immunoglobulins

5) True about sepsis

Tachypnea can be the first presenting sign (not sure)

6) A case of upper respiratory tract infection, prescribed amoxicillin by a physician, what to do?

May be to stop the antibiotic because it's most probably a viral infection (although guidelines say you should complete the course).

7) Most infectious TB?

Cavitating pulmonary TB (also the laryngeal TB is very contagious, and it was the

answer in another question (there was not cavitating pulmonary TB in the other choices)

8) Epigastric pain 4 hours after eating custard

S. aureus

9) Most common cause of cellulitis

Staphylococcus aureus (Streptococcus pyogenes is more common but it was not a choice)

10) An antibiotic contraindicated in pregnancy

doxycycline

11) Not in the management of common cold

antibacterial drug administration

12) True about C. difficile

diagnosed via stool toxin

13) True about sepsis?

Hypothermia is a poor prognostic sign

14) Doesn't cause severe diarrhea?

Bacillus cereus

15) A female who went to a restaurant and presented with vomiting after 5 hours

Dx: Staph (remember: S. aureus and B. cereus have pre-formed toxins that cause diarrhea in 30 mons to 6 hours)

16) True about Hepatitis B vaccine

protective against hepatitis D

17) Most serious type of malaria

P. Falciparum.

18) Disorder of phagocytosis?

chronic granulomatous disease

19) PCP pneumonia:

CD4 < 200

20) Which is false about sepsis:

blood culture is positive in 80% of cases

21) Which on the following is true about SIRS?

Bands more than 10%

22) Enterohemorrhagic E. coli:

antibiotics are contraindicated (they increase the risk of HUS)

23) Most common cause of death in brucellosis

Endocarditis

24) Not an anti-pseudomonal antibiotic

ceftriaxone

25) Immediate action after needle stick injury?

wash your hands with water and soap

26) Needle stick injury with Hep B in an individual not previously vaccinated, what to do?

Give the vaccine and Hep B immunoglobulins

27) True about sepsis

Tachypnea can be the first presenting sign (not sure)

28) True about Ascaris lumbricoides

Diagnosed by detection of eggs in stool

29) Wrong about C. difficle infection

C. difficile is a gram-negative bacillus (it's GP).

30) Most common age of HIV in Jordan

25-35 years

31) Can be acquired from unpasteurized milk

Mycobacterium bovis

32) Most common immunodeficiency - IgA deficiency

33) A case of upper respiratory tract infection, prescribed amoxicillin by a physician, what to do? - Maybe stop the antibiotic (although guidelines say you should complete the course).

34) the combination with worse nephrotoxicity

Vancomycin with amikacin

35) Which antibiotic causes arthropathy as a side effect?

levofloxacin

** To diagnose AIDS, you need either CD4 less than 200 or an AIDS-defining illness (anyone in the table except the first group as they are not considered AIDS-defining)

Note: Dr. Fares considered Kaposi as an AIDS-defining illness.

PATHOGEN	PRESENTATION	FINDINGS
CD4+ cell count < 500/mm³		
Candida albicans	Oral thrush	Scrapable white plaque, pseudohyphae on microscopy
EBV	Oral hairy leukoplakia	Unscrapable white plaque on lateral tongue
HHV-8	Kaposi sarcoma	Perivascular spindle cells invading and forming vascular tumors on histology
HPV	Squamous cell carcinoma at site(s) of sexual contact (most commonly anus, cervix, oropharynx)	
CD4+ cell count < 200/mm³		
Histoplasma capsulatum	Fever, weight loss, fatigue, cough, dyspnea, nausea, vomiting, diarrhea	Oval yeast cells within macrophages
HIV	Dementia	Cerebral atrophy on neuroimaging
JC virus (reactivation)	Progressive multifocal leukoencephalopathy	Nonenhancing areas of demyelination on MRI
Pneumocystis jirovecii	*Pneumocystis* pneumonia	"Ground-glass" opacities on chest imaging
CD4+ cell count < 100/mm³		
Aspergillus fumigatus	Hemoptysis, pleuritic pain	Cavitation or infiltrates on chest imaging
Bartonella spp	Bacillary angiomatosis	Multiple red to purple papules or nodules Biopsy with neutrophilic inflammation
Candida albicans	Esophagitis	White plaques on endoscopy; yeast and pseudohyphae on biopsy
CMV	Colitis, Retinitis, Esophagitis, Encephalitis, Pneumonitis (CREEP)	Linear ulcers on endoscopy, cotton-wool spots on fundoscopy Biopsy reveals cells with intranuclear (owl eye) inclusion bodies
Cryptococcus neoformans	Meningitis	Encapsulated yeast on India ink stain or capsular antigen ⊕
Cryptosporidium spp	Chronic, watery diarrhea	Acid-fast oocysts in stool
EBV	B-cell lymphoma (eg, non-Hodgkin lymphoma, CNS lymphoma)	CNS lymphoma—ring enhancing, may be solitary (vs *Toxoplasma*)
Mycobacterium avium–intracellulare, Mycobacterium avium complex	Nonspecific systemic symptoms (fever, night sweats, weight loss) or focal lymphadenitis	Most common if CD4+ cell count < 50/mm³
Toxoplasma gondii	Brain abscesses	Multiple ring-enhancing lesions on MRI

**Rule of 3: risk of infection after a needle stick injury: HIV: 0.3%, HCV: 3%, HBV: 30%.

**PPD +ve:

Induration of 5 mm and more is considered positive in:

- Immunosuppressed individuals (For example, long term steroids receiving the equivalent of prednisone ≥15 mg/day for ≥1 month, immunosuppressant drugs, etc.)
- HIV infected individuals.
- Recent contact with active TB patients.
- Prior tuberculosis signs on chest radiograph such as fibrotic changes.
- Organ transplant patients

An induration of 10 mm or more is considered positive in:

- Immigrants from endemic/high prevalence countries in the last 5 years.
- High-risk area employees and residents. For example, prisons, nursing homes, and homeless shelters.
- Injection drug abusers.
- Mycobacteriology laboratory professional
- Children less than four years of age.
- Chronic medical conditions that increase the risk of tuberculosis include diabetes, kidney failure, malignancy, etc.
- Infants/Children/adolescents exposed to high-risk categories.

An induration of 15 mm or more is considered positive in:

- Always considered positive in any person. Healthy individuals without any risk factors for TB.
- Patients who do not meet any of the above criteria[8]