| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| When is toxoplasmosis typically transmitted to a fetus (under what conditions)? | When the mother has a primary infection                                  |
| **Immunosuppressed patients sometimes experience reactivation of toxoplasmosis infections. Can congenital toxoplasmosis develop during reactivations?** | Yes                                                                     |
| Transmission of toxoplasmosis is most likely in what part of pregnancy? | Late (14% first trimester, 60% third trimester)                          |
| Congenital toxoplasmosis is generally most severe when acquired during what trimester? | The first (the earlier the infection, the greater the effect, in general) |
| **Is congenital toxoplasmosis usually evident at birth?**               | No – at least 75% are asymptomatic                                       |
| What two organs does congenital toxoplasmosis prefer?                  | Eyes & CNS                                                              |
| Is congenital toxoplasmosis more or less common in preemies?           | More                                                                    |
| What is the “classic triad” of symptomatic congenital toxoplasmosis?   | 1. Obstructive hydrocephalus  
2. Intracranial calcifications  
3. Chorioretinitis (white dots on retinal exam) |
**What is the main natural reservoir for toxoplasmosis?**

Cats

**In addition to cat feces, where else might someone encounter toxoplasmosis?**

1. Undercooked meat (especially pork) and eggs
2. Unpasteurized milk
3. Transfusions (of blood products including WBCs)

**When an adult is infected with toxoplasmosis, how do they present?**

(2 possibilities)

1. Usually they don’t present – it’s subclinical
2. Nonspecific illness with fever, lymphadenopathy, +/- rash

**What is the most typical outcome of congenital toxoplasmosis infection?**

Visual impairment & learning disabilities (presenting months to years later)

**In addition to nonspecific findings such as lymphadenopathy, fever, and hepatosplenomegaly, what other findings/signs are likely in infants with obvious congenital toxoplasmosis?**

(4 categories)

1. Chorioretinitis
2. Seizures
3. Microcephaly or hydrocephaly
4. Eye abnormalities (cataracts, microphthalmos, optic atrophy, glaucoma, etc.)

**What tests should be done to confirm suspected congenital toxoplasmosis?**

(3)

1. Serum (for IgM)
2. CSF
3. Head CT (for calcifications)

**If a neonate has congenital toxoplasmosis, what do you expect to see in the CSF?**

(3)

1. High protein
2. Pleocytosis
3. Xanthochromia

**How is congenital toxoplasmosis usually treated?** (asymptomatic)

12 months of: pyrimethamine + sulfadiazine + leucovorin

(some use spiramycin in the last 6 months)

**How long should an apparently healthy infant be treated for congenital toxo if his/her mother is known to have contracted the disease during pregnancy?**

4 weeks
(then confirm the diagnosis)
If a pregnant woman is known to be toxo infected (primary or recurrent), should she be treated?

Yes – Reduces risk of fetal infection or loss

What anti-inflammatory is sometimes given to infants with symptomatic toxoplasmosis?

Steroids

During treatment, infants with toxo must be monitored for medication side effects with what three tests?

1. CBC
2. Platelets
3. UA

How often?

• Every week

During what part of pregnancy is rubella infection most likely to affect a fetus?

U shaped probability – either early or late in gestation is bad

What kind of virus is rubella?

RNA

What is the natural reservoir for rubella?

Non-immunized humans only

If a child seems to have mononucleosis, but is negative for EBV, what is a likely cause?

CMV

What are latex agglutination tests used for?

(\textit{same infectious diseases as CIE or counter-immunoelectrophoresis testing})

Partially treated infections (looks for bacterial cell wall components)

What organisms can a latex agglutination test identify?

Grp B strep
\textit{H. flu}
\textit{N. meningitidis}
Strep pneumoniae

Which patients are most likely to have false-positive latex agglutination tests?

(2)

Hib vaccinated & Those infected with certain \textit{E. coli} types

What medications can be used to eliminate the carrier state of diphtheria?

Erythromycin or penicillin

Diphtheria vaccination protects a patient from what aspect of the infection?

The carrier state
Although *Pneumocystis carinii/jiroveci* (PCP) is an opportunistic infection, it is often seen in children without a known history of immunocompromise. Why?

**If a child is known to be at risk for PCP, what medication should be started?**

Bactrim®
(generic is TMP/SMX)

In an immunocompromised child with fever & neutropenia, what general categories of antimicrobials will your initial management definitely include?

1. Gram+ antibiotic
2. Gram− antibiotic (e.g., aminoglycoside)
3. Antipseudomonal

If a child presents with atypical tuberculosis, what underlying problem should you consider?

**Abdominal pain or obstruction + exotic foreign travel or foreign birth = what diagnosis?**

Ascaris lumbricoides
(at least think of it)

How is ascaris infection treated?

Albendazole, mebendazole, or ivermectin

“Staccato cough” – first 2 months of life – no fever – tachypnea =

Chlamydia pneumonia

What is the buzzword for *Chlamydia pneumoniae* infection on micro examination?

Intracytoplasmic inclusion bodies

How is chlamydia pneumonia treated?

Erythromycin
(or other macrolide)

Can chlamydia pneumonia be seen in adolescents/adults?

Yes
(it is another atypical along with mycoplasma)

How is chlamydia pneumonia definitely diagnosed?

Immunofluorescent antibodies
*Imagine fluorescent pink “Chlams” glowing in the dark*
| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| What is the name of the only rickettsial disease that causes pneumonia but no rash? | Q fever |
| A patient who presents with headache and a rash that moves inward from the extremities may have what serious infectious disease? | RMSF (Rocky Mountain spotted fever) |
| How is the rash of Rocky Mountain spotted fever described?              | Maculopapular –  
  - Starts on extremities  
  - Becomes petechial/purpuric |
| What is the treatment of choice for RMSF (Rocky Mountain spotted fever)? | Doxycycline (regardless of age!) |
| Why is it alright to use doxycycline in a child less than 9 years old if you are treating RMSF? | (Cost-benefit)  
  1. Risk of death vs. risk of tooth staining  
  2. Tooth staining is unlikely with short-term use anyway |
| What is a good way to remember the rash pattern for RMSF?               | If you were rock climbing in the Rockies, you would probably get some petechiae on your hands & feet |
| In case of doxycycline allergy, what alternative medication can be used to treat RMSF? | Chloramphenicol |
| How can CMV be transmitted to a neonate?                                | 1. Transplacentally with maternal infection (usually primary infection)  
  2. At delivery with maternal cervical colonization  
  3. Breast milk  
  4. Blood transfusion |
| If a pregnant mother contracts CMV, is she likely to notice the infection? | Usually noticed, but not always reported (nonspecific malaise-type illness) |
| What percentage of asymptomatically CMV-infected neonates develops serious visual, hearing, or cognitive impairments by age 2 years? | About 10 % |
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| What is “classic CMV inclusion disease?”                                | 1. IUGR                                                                |
| (6 components – One big thing Two small things Two sensory issues One lab thing) | 2. HSM (with jaundice & high LFTs)                                      |
| 3. Thrombocytopenia                                                     | 4. Microcephaly                                                        |
| 5. Sensorineural hearing deficit                                        | 6. Chorioretinitis                                                     |
| **How common is congenital CMV infection in the USA?**                  | **1–2% of births!**                                                    |
| Can a fetus contract CMV from a maternal reactivation of the disease?  | Yes, but very rare                                                     |
| What are the significant teratogenic effects of primary rubella infection? | 1. CV/heart problems (PDA & pulmonary artery stenosis)                 |
| (4 groups)                                                             | 2. Sensorineural hearing loss                                           |
| 3. Cataracts/glaucoma                                                  | 4. IUGR                                                                |
| **What percentage of rubella-exposed infants seems normal at birth?**   | **>50%**                                                               |
| Rubella-exposed infants are at risk for late-developing problems in what four organ systems? | 1. Special senses (hearing deficit)                                     |
|                                                                       | 2. CNS –                                                               |
|                                                                       |   (MR, autism, etc.)                                                   |
|                                                                       | 3. Endocrine (DM & thyroid dz)                                         |
|                                                                       | 4. Immune system (dyscrasias)                                          |
| If a pregnant mother contracts CMV, what tends to happen to the fetus even if it does not become infected? | Low birth weight/SGA                                                   |
| CMV is very common in the USA. Its effect in pregnant is unusual, though, because maternal infection during what part of pregnancy most often causes fetal infection? | Equal – It is always about 50% (for primary infections)                |
| **What is the long-term complication rate for infants born with symptomatic CMV infection?** | **High! 40–90%**                                                      |
| **What is the probability that an infant infected with CMV will be symptomatic?** | **10% are symptomatic**                                                |
What intestinal parasite is associated with bloody, mucous-y diarrhea and tenesmus?  

Entamoeba histolytica

Eosinophilia is a clue to look for in what type of infection?  

Parasitic

What is toxocara canis (in very general terms)?  

A dog parasite (worm) that sometimes accidentally ends up in a person (wrong host)

What types of problems/symptoms can toxocara canis cause?  

- Pulmonary wheezing  
- GI – hepatomegaly and/or abdominal pain

How can you remember that metronidazole treats Entamoeba histolytica?  

Picture a “hysterical amoeba” riding the metro to destruction (another option is tinidazole)

What other parasitic infection featuring bad diarrhea is treatable with metronidazole?  

Giardia lamblia

What is the best way to treat scabies in children?  

Permethrin cream

How do you identify scabies as the cause of a patient's itching?  

Look for long, narrow burrows at edges of clothing and intertriginous areas

How can you differentiate CMV from toxoplasmosis on head CT?  

Both cause calcifications but CMV is periventricular (toxo is diffusely spread throughout)

How can you remember that metronidazole (Flagyl®) treats trichomonas?  

They are “flagellated” organisms (sounds like Flagyl®!)

If a patient is found to have trichomonas, how many people need to be treated?  

The patient & all sexual contacts

Although current literature suggests that this medication is fine in some stages of pregnancy, for the boards, “can you use metronidazole in pregnancy?”  

No (Ob/gyns do use it, though, so don’t panic if you see this in real life)
What is the histological/micro buzword that tells you that a patient has bacterial vaginosis?

“Clue cells”

(Cells that have little bits of stuff hanging from the edges of their membranes)

What kind of discharge is expected with bacterial vaginosis?

Thin & gray

(aka “Gardnerella” – because it is usually the dominant organism)

What do you expect to see on exam of a patient with trichomonas?

1. Strawberry cervix
2. Yellow, frothy discharge

(Mnemonic: The little whips make the discharge frothy, and cause petechiae on the cervix (the petechiae are the strawberry seeds))

What is the name of the organism causing “cat scratch fever?”

Bartonella henselae (a bacteria)

How is cat scratch fever usually treated?

Self-limited – usually supportive care only

If a patient has unusually severe cat scratch fever, or is immunocompromised, how could you try to treat the infection? (which medication?)

Azithromycin

How would you know that a patient’s cat scratch fever is unusually severe?

Significant lymphadenopathy (large & painful)

&

Hepatosplenomegaly

What is the buzzword description for Haemophilus influenza on micro examination?

“Gram-negative pleomorphic organisms”

Although H. flu is much less common in the USA due to immunization, which populations are likely to get it?

1. Immigrants/foreign visitors
2. Unimmunized US children (younger than school aged)

What is the drug of choice for treating H. flu infection?

Ceftriaxone
### General Infectious Disease Question and Answer Items

| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| How aggressive are *H. flu* infections in general?                      | Very aggressive (jump on them! With Ceftriaxone)                       |
| *H. flu* is one significant cause of otitis media. Do immunized children avoid this infection? | No – the vaccine does not prevent the OM infection (It is non-typeable *H. flu*, not covered by the vaccine) |
| If a child has had a properly documented pertussis infection, do he/she still need to be immunized against it? | Yes! [This is a change – natural immunity is now known to wane in as little as 4 years, so routine immunization is recommended EVEN AFTER a documented infection!] |
| Does antibiotic treatment help with the coughing of whooping cough?     | It may decrease the coughing if started early, before coughing fits begin |
| Which antibiotics are most recommended for pertussis treatment?         | Azithromycin or erythromycin (macrolides)                              |
| What alternative antibiotic may be used for pertussis, in those older than 2 months? | Trimethoprim/sulfamethoxazole                                          |
| In what phase of pertussis infection is it worthwhile to give antibiotics? | The catarrhal (URI) stage                                              |
| How does erythromycin improve the catarrhal stage of pertussis infection? | It shortens it (same for the other antibiotic treatment options)         |
| In what other way is antibiotic treatment of pertussis infection helpful? | Decreases communicable period – not communicable 5 days after antibiotics are started! |
| Elevated WBCs with a lymphocytosis, and a child with a prominent cough, is likely to be what disease? | Pertussis (usually in an immigrant, foreign visitor, or preschool group) |
| *Bartonella henselae* causes what disorder?                             | Cat scratch fever                                                      |
| What organism causes whooping cough?                                    | *Bordetella pertussis*                                                 |
| **Gram-negative pleiomorphic organisms** = what bacteria?               | *H. flu*                                                               |
What organism is responsible for the *H. flu* type of otitis media?  
Non-typeable *H. flu*

Thin, gray discharge + clue cells = what disorder?  
Bacterial vaginosis

Frothy, yellow discharge + strawberry cervix = what disorder?  
*Trichomonas vaginalis*

Contacts of individuals with pertussis need what treatment?  
Erythromycin prophylaxis

Should individuals who have been successfully immunized against pertussis still receive prophylactic treatment?  
Yes – it prevents spread of the organism (asymptomatic individuals may still spread it)

What two animals are the typical carriers for salmonella?  
Chickens & Humans  
(domesticated turtles can also occasionally be a source)

Vomiting, fever, and bloody loose stools 1–2 days after a group picnic is a likely vignette for what infection?  
Salmonella

Should salmonella be routinely treated with antibiotics?  
No – It is likely to cause a carrier state

When might you treat salmonella enteritis with an antibiotic?  
Very severe infection/immuno-compromise

To identify an infant at risk for congenital syphilis, should you test the mother, the infant, or either one?  
The mother  
(infant serum or cord blood is not sufficient)

If a mother is known to have had syphilis but it was treated prior to pregnancy with erythromycin, is congenital syphilis still a concern?  
Yes – Any non-penicillin treatment regimen is suspect

If an infant is born whose mother’s HIV status is unknown, what should you recommend?  
HIV testing after counseling + consent of mother (some states allow testing without consent, but the above is preferred)
In which body systems does adenovirus cause infection?

1. Respiratory
2. GI
3. Conjunctivitis/eyes
4. GU

How is the GI version of adenovirus transmitted?
Fecal-oral

How is the respiratory version of adenovirus transmitted?
Contact with infected secretions

What unusual version of adenovirus is sometimes seen in groups, after the individuals go swimming in a poorly chlorinated pool?
Pharyngoconjunctival fever

What worrisome, but usually spontaneously resolving, complication is sometimes seen with pharyngoconjunctival fever?
Corneal opacities

“Preauricular lymphadenopathy” + conjunctivitis (bilateral) = Adenovirus Keratoconjunctivitis (also sometimes responsible for corneal opacities – self-resolving)

When is respiratory adenovirus most common?
Winter + spring

What treatment is needed for adenovirus infections?
Supportive care (+ isolation of health care workers & school children at home)

What are the symptoms of pharyngoconjunctival fever?
1. Fever (it’s in the name after all)
2. Conjunctivitis
3. Pharyngitis, rhinitis and cervical adenitis

Why does adenovirus sometimes present as meningitis?
It sometimes causes meningismus
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| What type of infection does adenovirus usually cause?                   | Respiratory (10% of peds respiratory disease is supposedly adenovirus) |
| What sort of GI symptoms does enteric adenovirus cause?                | Watery diarrhea (most common in infants)                                |
| When adenovirus causes GU effects, what symptoms or signs are seen?    | Gross hematuria, Dysuria, Frequency (more common in males)              |
| Does adenovirus cause upper or lower respiratory symptoms?             | Either                                                                  |
| If you want to identify adenovirus as the cause of a child's infection, what body fluids should you send? | Stool and nasopharyngeal swab have the highest yield (can also attempt to isolate from urine or conjunctival swab) |
| When adenovirus causes lower respiratory infection, what part of the lungs is most likely to be affected? | The lower lobes |
| During adenovirus infection, what is a CBC likely to show?             | Left shift + leukocytosis or leukopenia                                  |
| Which bacterium causes diphtheria?                                      | Corynebacterium diphtheriae                                             |
| What is the main buzzword for diphtheria infection?                    | Gray *pseudomembrane* (in the throat)                                   |
| What aspect of diphtheria infection causes its associated problems?    | The exotoxin it makes                                                   |
| What creates the pseudomembrane in diphtheria infection?               | Tissue edema + Coagulative necrosis of the mucous membrane              |
| How is diphtheria spread, generally?                                   | Respiratory droplets (+ sometimes via breaks in skin, conjunctiva, etc.) |
During which season do most diphtheria cases occur?

Winter (possibly due to more indoor crowding)

If children or adults are exposed to an active case of diphtheria, but have previously been fully immunized, should anything be done?

Yes – *They require erythromycin or PCN & a booster if the last immunization was >5 years ago*

Is diphtheria still endemic in some parts of the world?

Yes – In most of the developing world

What are the four common forms of diphtheria?

1. Nasal (infants, especially)
2. Pharyngotonsillar
3. Laryngeal
4. Cutaneous

Why is cutaneous diphtheria important?

It is a big reservoir for infection in warm climates

How long is the incubation period for diphtheria?

1–6 days

Which type of diphtheria is most dangerous?

Laryngeal (due to easy compromise of the airway)

Which form of diphtheria is most likely to produce a carrier state?

Nasal

What are the four main factors that determine how severe a particular case of diphtheria is likely to be?

1. Prior immunization (less severe)
2. Virulence (toxigenic form is worse)
3. Time to antitoxin (less is better)
4. Location of membrane (laryngeal)

What are the four main complications of diphtheria?

1. Airway obstruction/compromise
2. Myocarditis
3. Renal tubular necrosis
4. Demyelination of motor nerves

What precautions should you take with hospitalized diphtheria patients?

Respiratory isolation until 3 consecutive cultures from infection sites are negative

What is the mainstay of treatment for diphtheria infection?

Diphtheria antitoxin
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|----------------------------------------------------------------------|
| What is the only form of diphtheria that can be treated by antibiotics alone (no antitoxin needed)? | Cutaneous                                                             |
| How does laryngeal diphtheria present?                                  | Like croup (it often develops from the tonsillo-pharyngeal form)      |
| After the symptoms of diphtheria begin, how long is it until pseudomembranes start to form? | 1–2 days                                                              |
| Although cardiovascular collapse can occur with diphtheria toxin production, the usual course for diphtheria-induced myocarditis is . . . ? | Spontaneous resolution                                                |
| What, in general, do the neurological complications of diphtheria consist of? | Demyelination of motor pathways (mainly oculobulbar, but can also affect peripheral nerves) |
| What two factors determine the likelihood of diphtheria complications? | 1. interval between symptom onset and antitoxin administration  
2. quantity of membranes                                             |
| How does nasal diphtheria present?                                      | Like a nasal foreign body except bilateral (initially clear discharge, then serosanguinous, then smelly mucopurulent) |
| What happens if you try to remove the pseudomembrane of diphtheria?    | It bleeds (most exudates, etc., do not)                                |
| What special finding in the vital signs suggests diphtheria?            | Heart rate unexpectedly high for temperature                          |
| What unusual effects can diphtheria have on the special senses?         | Conjunctivitis & Aural diphtheria (otitis externa)                      |
| Although diphtheria is a clinical diagnosis, what confirmatory test should be sent? | A culture from the membrane or just below the membrane |
How many doses of diphtheria vaccine are needed to immunize a healthy young child?

Five (roughly: 2 months, 4 & 6 months, 18 months, 4 years)

How is diphtheria immunization different for patients older than 7 years?

1. Different vaccine – Td or Tdap (adult type) is given rather than DTaP or DT
2. Different schedule – Two doses at least 4 weeks apart, then repeat 6 months later

What does the lower-case “d” vs. the capital “D” indicate, in the vaccine name?

The lower-case “d” indicates a reduced dosage diphtheria used in older patients

How is diphtheria treated?

1. An IV bolus of antitoxin (amount varies)
2. 14 days of PCN-G, procaine, or E-mycin

How do people become infected with ascaris?

Fecal-oral ingestion of eggs

What are the main organ systems affected by ascaris?

Pulmonary & GI

The life cycle of ascaris is 2 months long. Where do the worms travel in the body?

1. Eggs to gut then to portal venous system
2. Pulmonary vessels into alveoli
3. Coughed up & swallowed
4. Grow to adults in small intestine

What types of animals can ascaris lumbricoides infect?

Humans only

(1/4 of the world’s population is infected!)

What problems can ascaris cause in children with abdominal ascaris?

1. Obstruction
2. Malabsorption
3. Growth failure
4. Intussusception
5. Abdominal pain
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Where does obstruction due to ascaris occur?                           | Ileocecal valve                                                        |
| What sorts of pulmonary symptoms/signs are seen as ascaris migrates through the lung? | Fever, cough, dyspnea, & wheezing (causes an eosinophilic bronchopneumonia) |
| Will you see infiltrates on CXR during the pulmonary migration of ascaris? | Yes                                                                    |
| Are patients with ascaris usually symptomatic?                         | No – If the infection is only moderate, most are asymptomatic          |
| If a patient is diagnosed with ascaris, what other things should you look for? | Other parasites (often multiple infections)                             |
| How is ascaris treated?                                                 | A single dose of pyrantel pamoate (alternate regimen for kids older than 2 years: mebendazole for 3 days) |
| Where does aspergillus usually cause infection?                        | The lung                                                               |
| Is aspergillus likely to cause infection in HIV+/AIDS patients?         | No (infection fighting depends on phagocytes, not T-cell immunity, for this bug) |
| What is the most common form of aspergillus infection? Is it invasive?  | • Aspergilloma (pulmonary fungus ball)                                 |
|                                                                       | • No                                                                   |
| Which patients are at risk for invasive aspergillosis?                 | Those with neutrophil or macrophage problems (Including chemo, leukemia, long-term Abx, or steroid use) |
| Where is aspergillus found, & how is it transmitted?                   | • Everywhere                                                          |
|                                                                       | • Transmitted by lightweight airborne spores                           |
In what ways does aspergillosis affect healthy people?

(2) Ear & sinus infections in warm, wet regions & Allergic bronchopulmonary aspergillosis

What is allergic bronchopulmonary aspergillosis?

Local pulmonary reaction to aspergillus spores trapped in mucus

Which patients are at risk for allergic bronchopulmonary aspergillosis?

Those with chronic respiratory disorders

What are the symptoms of allergic bronchopulmonary aspergillosis?

Wheezing
Fever
_Eosinophilia_
Infiltrates on CXR productive cough (+ brown mucous plugs)

As with most invasive fungal diseases of the immunocompromised, what is the prognosis for disseminated aspergillosis?

Bad – Amphotericin B & Debridement are urgently needed

If an aspergilloma causes symptoms, what symptom is it most likely to cause?

Hemoptysis

Why are the infiltrates seen with allergic aspergillosis “transient”?

Because they develop in areas where mucous plugs cause obstruction (if the plug is coughed up, they disappear)

How does “otomycosis” appear on physical exam?

Black spores begin at the TM, & may fill the EAM! (yuck!)

How does sinusitis from aspergillus present?

Chronic sinusitis that doesn’t respond to Abx

What are the two buzzwords for allergic pulmonary aspergillosis?

Transient infiltrates & Brown or dark mucous plugs
What lab findings suggest aspergillosis?  
1. Elevated Ig E 
2. Eosinophilia 
3. Branching, septate hyphae 

Can the aspergillus species that causes human infection be cultured?  
Yes 

How is noninvasive aspergillus sinusitis treated?  
Surgical drainage/debridement 

Aspergillus otomycosis usually coexists with chronic bacterial otitis. How is it treated?  
Debridement & treat the external infection (bacterial) 

How do people encounter atypical mycobacteria?  
Air, water, meat, & egg products 

What are typical mycobacterial infections?  
1. \( M. \) \textit{tuberculosis} 
2. \( M. \) \textit{bovis} 
3. \( M. \) \textit{leprae} 

What are atypical mycobacterial infections?  
Any that are \textbf{not} the three typical infections 
(Those three are tuberculosis, bovis, & leprae) 

What type of infection commonly develops with atypical mycobacterial infection in immunocompetent individuals?  
Cervical adenitis in preschoolers (rarely, may also cause otitis or mastoiditis) 

What immunocompromised patients are at risk for atypical mycobacterial infection?  
HIV (other T-cell disorders do not increase rates of atypical mycobacterial infection) 

In what situation might atypical mycobacteria cause a chronic infection of skin, soft tissue, or bone?  
Following trauma or surgery 

What signs suggest that cervical adenitis is due to atypical mycobacteria?  
1. Single node or single region of LAD 
2. No systemic symptoms 
3. Not warm or tender
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| Why is the cervical adenitis of atypical mycobacteria often called a “cold abscess?” | It is literally not warm, as most abscesses would be                     |
| How is the diagnosis of atypical mycobacterial infection confirmed?      | Culture or micro identification from specimen                             |
| What prophylactic medications may be given to HIV+ children to prevent atypical mycobacterial infection? | Azithromycin weekly                                              |
| **How is isolated cervical adenitis due to atypical mycobacterium treated?** | **Surgical excision** (usually no meds needed)                              |
| **Why is draining cervical adenitis due to atypical mycobacterium a bad idea?** | **It can produce a chronically draining situation** (unless you excise it after making the diagnosis) |
| **After excising an atypical mycobacterium cervical adenitis, should you follow up with an antibiotic?** | **No – but the child should be followed for recurrence for 1 year** |
| What additional diagnostic should be obtained for patients with atypical mycobacterium infection? | **CXR**                                                                 |
| Fever, malaise, and hemolytic anemia go with what tick-borne illness?    | Babesiosis (although most people are actually asymptomatic)             |
| Can babesiosis be transmitted from mother to child in utero?            | Yes – but uncommon                                                        |
| The ticks that carry babesiosis are also frequently carrying what other disease? | **Lyme**                                                                |
| Where in the body does babesiosis live?                                 | Inside the RBC                                                           |
| What patients are at special risk of more severe disease with babesiosis? | 1. Extremes of age                                                        |
|                                                                          | 2. Immunocompromised                                                      |
|                                                                          | 3. No spleen                                                             |
|                                                                          | 4. Coinfected with Lyme disease                                           |
What very similar syndrome to babesiosis is seen in the Western USA?

WA1 protozoal infection
(W – Western, A – American)

What is typical presentation for patient with symptomatic babesiosis infection?

Systemic symptoms:
1. Intermittent fevers – may be high (40 °C)
2. +/- chills, myalgias, arthralgias

Do babesiosis patients have hepatosplenomegaly?

Sometimes – not reliable
(but the spleen is very important in fighting this infection)

What blood test should you send if you are hoping to identify babesiosis infection?

Thick & thin smear (same as malaria)

What special microscopic appearance is the “buzzword” for babesiosis on the smear?

“Maltese crosses” – due to the characteristic grouping of 4 parasites together

What might the UA of a babesiosis patient show?

(2) Proteinuria & Hemoglobinuria

In addition to anemia, what other CBC abnormalities often occur in babesiosis?

(2) Thrombocytopenia & Lymphocytosis (often atypical)

How are mild or asymptomatic cases of babesiosis treated?

Usually no treatment needed

What stains will usually identify protozoal parasites like babesiosis?

(2) Giemsa or Wright’s

What type of anemia is seen with babesiosis?

Normocytic, normochromic
(Imagine, it is an acute, not chronic, problem – no time to change the size of the cells being synthesized)

Approximately what percentage of babesiosis patients also has Lyme infection?

¼
For patients with significant symptoms of babesiosis, or significant risk factors (asplenic or immunodeficient), how should babesiosis be treated?

In rare cases of life-threatening babesiosis, how can the patient be treated?

What are the two most worrisome complications of babesiosis?

Can you catch babesiosis more than once?

How long does a tick need to be attached to transmit babesiosis (or Lyme disease)?

How does someone get blastomycosis?

Is blastomycosis more common in children or adults?

What are the three forms of blastomycosis infection?

What form of blastomycosis is most common in children?

Although many cases of blastomycosis are asymptomatic or spontaneously resolving, how is it treated when intervention is needed?

How is cutaneous blastomycosis acquired?

What types of skin lesions might you see with cutaneous blastomycosis?
| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| Where in the USA are you most likely to develop blastomycosis?          | Central & Southeastern USA  
(\textit{Blastomyces is present in a variety of other countries, also}) |
| Which neonates are at greatest risk for developing a brain abscess after meningitis? | Those who had gram-negative meningitis |
| In general, what two organisms are most commonly found in brain abscesses? | Staph  
&  
Strep  
(various species) |
| Abscesses in the frontal lobes of the brain usually develop from what source? | Frontal sinusitis |
| About what percentage of children with congenital \textit{cyanotic} heart disease will develop a brain abscess? | About 3% (!) |
| After having a brain abscess, what proportion of kids will have some long-term neurological problems? | About 1/3 |
| What procedure must not be performed on patients with brain abscesses?   | LPs  
(it is a space-occupying lesion and there is a risk of hemiation) |
| For patients who can talk, what is the most common complaint associated with a brain abscess? | Headache |
| Headache +/- fever + a focal neurological complaint = | Brain abscess |
| Do patients with brain abscesses develop meningismus?                   | Yes –  
About 1/3 will |
| If CSF were obtained from a brain abscess patient, what would you expect to find? | ↑ protein  
↓ glucose + pleocytosis  
(no organisms unless the abscess has ruptured) |
How are brain abscesses typically treated?

Antibiotics (at least 3 weeks) +
Surgical excision (if it’s a single abscess in an accessible location)

If a patient develops a brain abscess and has no obvious source, what three services need to evaluate the patient for predisposing factors?

1. Dental
2. ENT
3. Cardiology

Breast abscesses in adolescents are likely due to what organisms (in general terms)?

Staph aureus & Sexually transmitted diseases (STDs)

How are breast abscesses in adolescents treated?

1. IV oxacillin or nafcillin, then PO meds (total treatment time of 14 days)
2. I & D
3. Compresses
(all are needed)

Should a breast-feeding adolescent or adult continue breast-feeding if she develops a breast abscess?

Yes, from the unaffected breast (milk should still be expressed, but discarded, from the affected side)

What is the most common cause of bronchiolitis?

RSV (respiratory syncytial virus)

How is RSV bronchiolitis generally treated?

Supportive care +
β-adrenergic agent for wheeze

Are bronchodilators, or anti-inflammatories such as steroids, useful in treatment of RSV?

Bronchodilators are often used in hospitalized patients, although it is not clear from data whether it is helpful or not
Steroid use is not supported by available data

Which medication is indicated for treatment of severe RSV cases, although its efficacy is not entirely clear?

Ribavirin –
Severe disease and/or high risk for severe disease (e.g., transplant patients)
Most effective if started early!
| Question                                                                 | Answer                                                                                                                                 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| What medication may be given as prophylaxis against RSV infection, and what kind of treatment is it? | Palivizumab (Synagis®): It is a monoclonal antibody (administered IM once per month during RSV season)  |
| What is usually considered to be “RSV season” in the USA?              | November through end of March                                                                                                         |
| Which chronic lung disease patients should receive RSV prophylaxis?     | ≤2 years old & requiring treatment for the lung problem within 6 months of the beginning of RSV season                                  |
| Which heart patients should receive RSV prophylaxis?                   | ≤2 years old & cyanotic or complicated congenital heart disease                                                                        |
| Which three sets of preemies require palivizumab prophylaxis?          | • Born ≤ 28 weeks & ≤ 12 months old at RSV season start  
• Born 29–32 weeks & ≤ 6 months old at RSV season start  
• Born 32–35 weeks & ≤ 3 months old at RSV season start |
| Which children require RSV prophylaxis at any age?                     | Those with difficulty handling airway secretions                                                                                                                                                  |
| Where might patients encounter brucellosis?                           | 1. Contact with farm animals  
2. Unpasteurized dairy products                                                                                                                |
| Why is brucellosis sometimes difficult to culture?                     | It reproduces inside the host’s phagocytes                                                                                              |
| How long does brucellosis infection usually last?                      | Less than 3 months                                                                                                                      |
| How is brucellosis treated?                                            | TMP/SMX or doxycycline – adding rifampin may decrease relapse rates                                                                  |
Why is it important to complete the antibiotic regimen for brucellosis? To prevent relapses

For symptomatic patients, what are typical findings of brucellosis? Hepatosplenomegaly + Lymphadenopathy (localized infections may be found anywhere, however, including the vertebra)

What type of bacterium is brucellosis? Gram negative (there are four types of brucellosis)

Brucellosis is well known for its tendency to affect which organ system? Nearly any of them – Endocarditis, gut complaints, neuropsychiatric effects, joint problems, etc.

Where does campylobacter infection come from? Domestic & farm animals (meat, unpasteurized milk, contaminated water) + Person to person (fecal-oral)

What are the three forms of campylobacter infection? 1. Systemic 2. Enteritis (ileocolitis) 3. Antral gastritis

What is the most common type of campylobacter infection seen in children? Inflammatory ileocolitis

What special “after effects” of campylobacter are sometimes seen? Postinfectious autoimmune complications

What postinfectious complications are most common following campylobacter infection? 1. Guillain-Barre 2. Reiter syndrome 3. Reactive arthritis 4. Erythema nodosum

When is campylobacter infection most common? Summertime (unlike most bugs that like the winter)

Nausea, vomiting, halitosis, and crampy epigastric pain suggest what infectious diagnosis? Campylobacter gastritis
Along with *Yersinia enterocolitica*, what is campylobacter known for mimicking? Appendicitis! (& sometimes intussusception)

Most patients with campylobacter recover quickly. Which two long-term complications are sometimes seen with campylobacter? Arthritis & Guillain-Barre

Campylobacter is estimated to be responsible for what percentage of the US Guillain-Barre cases? 40%

**Does campylobacter enteritis require treatment?**

No – it usually resolves in about 5 days

What is a *typical* presentation of campylobacter enteritis?“ Fever, abdominal pain, bloody or mucous-y diarrhea

Are the animals infected with the various types of campylobacter ill? No – they are asymptomatic

**Should campylobacter gastritis be treated?**

Yes – if not treated it tends to continue in a chronic phase for months

**How can campylobacter be rapidly identified in fresh stool specimens?** The curved rods “dart around”

What is the *gold standard* for identification of campylobacter pylori (the gastritis bug)? Gastric mucosa biopsy & culture (from the biopsy)

What medication is used to treat campylobacter infections caught early? Azithromycin (many others are often also effective)

How do most patients acquire campylobacter infection? Contact with contaminated meat (*proper cooking does kill it*)

**Does campylobacter infection pose any risk to fetuses?** Yes

1. Infected mothers (even if asymptomatic) have more abortions & preterm deliveries
2. Fetal & newborn fatal infection sometimes occurs
Do you need to get rid of your cat if someone in the family develops cat scratch disease? No – the cat is not likely to carry the bacteria chronically

What is the general appearance of a lymph node infected with *Bartonella henselae*?

1. Central necrotic area
2. Hypertrophied
3. Thickened cortex
4. Pus-filled sinuses

Which cats are most likely to transmit cat scratch disease?

Those less than 1 year old

The most frightening complication of cat scratch disease is encephalitis. What is the typical course of this complication?

- Develops about 1 month after basic cat scratch disease
- Sudden onset
- Coma
- **Full recovery**

Does cat scratch disease cause a rash? No – But there may be a papule that changes to a crust at the site of the cat contact

Where will you see lymphadenopathy following cat scratch disease exposure?

The lymph nodes draining that area (unilateral)

What percentage of the enlarged lymph nodes of cat scratch disease will form a tract thru the skin?

<50 %

How should you treat a tender, large, cat scratch disease node? Drain it

In cases of severe cat scratch disease or immunocompromise, how should it be treated? Azithromycin or Bactrim® first choice – IV or IM gentamicin also used

How long will it take for all symptoms of cat scratch disease to disappear? Weeks to months (nodes resolve last)

**Unilateral proptosis, lid swelling, and fever could be signs of what dangerous syndrome?** Cavernous sinus syndrome (infectious etiology)

**What infections put patients at special risk for developing cavernous sinus syndrome?** Any facial infection (including dental, sinus, & significant acne)
How great is the mortality from infectious cavernous sinus syndrome?  
About 25 %

How useful are blood cultures for treatment of infectious cavernous sinus syndrome?  
Actually quite useful – 70 % will grow something

**How long should you treat infectious cavernous sinus syndrome?**  
Approximately 4 weeks after symptoms resolve

What unfortunate surprise often occurs with infectious cavernous sinus syndrome?  
Relapse (locally) or development of embolic abscesses about 4 weeks after treatment is completed

What is the usual long-term outcome for patients who recover from infectious cavernous sinus syndrome?  
Long-term cranial nerve defects

If infectious cavernous sinus syndrome is not rapidly treated, how will it present?  
Meningitis/overwhelming sepsis

**What is the main physical finding to look for with a case of cellulitis (suggests you might want to admit the person)?**  
Lymphangitis (aka lymphangitic spread)

Facial cellulitis due to what organism often leads to pneumonia, arthritis/osteomyelitis, and other disseminated foci of infection?  
Haemophilus influenza type B

Patients suspected of having cavernous sinus syndrome should have what radiological study?  
MRI with & without gadolinium (CT is okay but not the gold standard)

Cervical motion tenderness on gyn exam indicates what general problem?  
Peritonitis (may or may not be gyn related)

What do we use KOH preps to identify, in a gyn patient?  
Yeast (Candida) infection

What is the trouble with treating vaginal yeast infections with the one-time dose of fluconazole?  
1. Costs the same as other regimens  
2. No symptom relief for at least 1–2 days
For any patient found to have cervicitis, what two infections must you presumptively treat?

Chlamydia & gonorrhea

What is the most cost-effective treatment regimen for gonorrheal/chlamydial cervicitis?

Ceftriaxone 250 mg IM or Cefixime 400 mg PO

+ Doxycycline, 100 mg PO BID x 7 days

What is the problem with treating adolescents with the doxycycline STD regimen?

1. Poor compliance due to BID dosing
2. 7 days of treatment
3. Need to fill prescription
4. High stakes for future fertility

What treatment regimen for gonorrhea/chlamydial cervicitis can you give during your patient's visit to ensure compliance?

Ceftriaxone 250 mg IM x 1

+ Azithromycin 1 g PO x 1

(can also give single PO dose of 2 g azithromycin alone, but nasty lower GI side effects usually follow)

Gram-negative diplococci seen with cervicitis = what infection?

Gonorrhea

What exam must be performed in females presenting with cervicitis or vaginal yeast infections?

A bimanual pelvic exam

Should a patient with cervicitis have any pain, or other abnormal findings, on gyn exam?

No – Anything else suggests PID, ectopic pregnancy, etc.

How is the ulcer of chancroid different from the initial syphilitic ulcer (which is also called a chancre)?

The syphilis ulcer is painless

How are the ulcers of chancroid different from those seen in HSV?

Chancroid ulcers are deep with undermined edges

(HSV ulcers are very shallow, not undermined, & multiple)

Like HSV, chancroid requires what condition to infect a person?

A break in the skin (including an abrasion)
What microbe causes chancroid? Haemophilus ducreyi (Gram negative)

Under what circumstances is chancroid transmitted? Sexual contact with someone with an ulcer

What three other STDs should be considered in individuals who have developed chancroid? 10% coinfection with HSV, syphilis, or HIV (all also transmitted via breaks in skin)

How is chancroid treated? Azithromycin 1 g PO × 1
Or Ceftriaxone 250 mg IM × 1
(Cipro 3 days & E-mycin 7 days are also options)

Regional lymphadenopathy usually accompanies chancroid. What complication can this lead to? Fluctuant or draining bubo (A bubo is an inflamed lymph node)

How is chancroid diagnosed? Clinically (a follow-up culture to confirm is the gold standard)

What three chlamydial bacteria affect humans? 1. C. trachomatis 2. C. pneumoniae 3. C. psittaci

Which type of chlamydia is usually responsible for chlamydial pneumonia in infants? Chlamydia trachomatis

Which type of chlamydia is responsible for conjunctival infection & blindness in the developing world? C. trachomatis

Which type of chlamydia is the common STD? C. trachomatis

Which chlamydial type is usually responsible for chlamydial pneumonia in adults & older children? C. pneumoniae
Chlamydial pneumonia causes approximately what proportion of childhood community-acquired pneumonias (CAP)?

20–25%

How do most patients with chlamydial pneumonia present?

Asymptomatic – they don’t present

How do infants generally acquire chlamydial pneumonia?

Via vaginal delivery (although C/S does not fully prevent it)

How is *Chlamydia psittaci* acquired?

Inhaled bird excrement or bird secretions

(The bird may be healthy or sick)

In addition to chlamydial pneumonia, what other problems can *Chlamydia psittaci* sometimes cause?

Bronchitis, pharyngitis, & otitis media

(nasal discharge is common with all 3)

What is the buzzword for chlamydial infection on microscopic evaluation?

Inclusion bodies

(It’s an obligatory intracellular bacteria)

How is *Chlamydia pneumoniae* acquired?

Inhaled aerosolized droplets

Do infants with *C. trachomatis* have a fever?

No

Do children with *C. pneumoniae* have a fever?

Generally yes

In general, how are chlamydial infections treated?

Macrolides

What is the overall probability of resistance to erythromycin in chlamydial infection?

20%

In a case of known maternal GU chlamydial infection, is treatment with topical erythromycin to the conjunctivae sufficient?

No – it will not eliminate nasopharyngeal colonization
If you suspect chlamydial infection, but the immunofluorescent study for Chlamydia is negative, what does this mean?

Nothing  
(>50% of chlamydial infections have negative results)

If a mother with untreated GU chlamydial infection delivers a baby, how should you treat the (asymptomatic) infant?

You don’t – monitor for signs of infection

If a mother delivers a baby who develops a chlamydial infection, what is the appropriate treatment?

Oral erythromycin × 14 days  
(don’t forget that mom and partner(s) need treatment as well)

After completion of an antibiotic course for neonatal chlamydia infection, what should be done?

Follow-up –  
Erythromycin is only 80% effective in eradicating chlamydial infections, so a second course could be needed

What are the typical CXR findings of chlamydial pneumonia (infants)?

- Bilateral infiltrates  
- Hyperinflation

If an infant is found to have chlamydial infection, what else must you do, in addition to treating the chlamydia?

Look for other STDs  
(syphilis, Hep B, HIV, gonorrhea, etc.)

Although humoral immunity is important in preventing and fighting varicella virus (antibodies), what immune component is most critical to preventing severe disease?

Cell-mediated immunity  
(T-cell system)

What organ systems may be affected by varicella zoster, if it disseminates?

Basically, any (pneumonitis is especially common)

What is the main effect of congenital varicella infection?

Limb scarring and atrophy  
(CNS & eyes may also be affected)

Can a person with herpes zoster (shingles) spread the virus?

Yes –  
Through contact with affected skin; respiratory transmission is a remote possibility
The severe complications that cause death from varicella infection are more common in adults than children. How much more common?

35 times!

How likely are you to catch varicella if you are exposed and are not immune?

98% (!) (figures vary)

If an individual has had chicken pox, is he or she immune for life?

Generally yes (reinfection is possible, but it is usually mild)

What patient groups are at highest risk for varicella complications?

1. Infants 3 months – 1 year
2. Adolescents/adults
3. Chronic aspirin therapy
4. Immunocompromised
5. Pulmonary disease (incl. asthma)
6. Pregnant women
7. Chronic skin disorders (severe eczema, etc.)

In what order does the varicella rash develop?

1. Macule
2. Papule
3. Vesicle
4. Crust

In addition to the typical rash stages, what other buzzwords describe the varicella rash?

1. Rash in various stages over body
2. “Dewdrop on a rose petal” appearance

What are the typical seasons for varicella?

Winter & spring

Is it alright to use aspirin or NSAIDs for children with chicken pox?

No –

Aspirin + varicella = Reye’s syndrome
NSAIDS + varicella = increased incidence of bacterial superinfection

When should antiviral therapy be given to chicken pox patients?

1. Hospitalized patients
2. Newborns & adolescents
3. Immunocompromised (incl. those on inhaled steroids)
4. Chronic skin or lung disease
5. Pregnant
What type of isolation is needed for hospitalized varicella patients?

Contact and respiratory (while vesicles present)

How long should an exposed, varicella susceptible individual be isolated? (if hospitalized)

From days 8–21 after rash develops in the index case

Who usually has more severe disease, the index case, or the secondary cases, in varicella infections?

Secondary cases, in general

In current practice, which patient groups should not receive varicella vaccine?

1. Infants <1 year
2. Immunocompromised (but some HIV+ should get it)
3. Pregnant women
4. Patients with malignancies of the blood/bone marrow or lymphatic system
5. Recently received blood products (up to 11 months prior)

What is required for maximum protection from the varicella vaccine?

A second dose (the regimen is now two doses, to minimize declining immunity after vaccination)

If a varicella non-immune patient is exposed to varicella, but cannot receive the vaccine, what other prevention strategy should be considered?

VZ-IG

During what portion of pregnancy can varicella cause birth defects?

Between the 8th and 20th weeks

Teratogenic varicella affects what portion(s) of the developing embryo/fetus?

The ectoderm (eyes, skin, CNS, & limbs are affected)

Why are the limbs affected in teratogenic varicella?

Damage to the ectodermal structures of the brachial & lumbar nerve plexi causes limb abnormalities
How should you care for a pregnant mother exposed to varicella in the first or the second trimester?

VZ-IG if not immune – Acyclovir if chicken pox has already developed

If the embryo or the fetus is infected by varicella in the 1st or the 2nd trimesters, what is the likely outcome?

Bad – death or severe CNS damage

Although varicella can have teratogenic effects, congenital varicella means something else. What does it mean?

Maternal infection developed in the last 3 weeks of gestation, or first week after birth

If the infant develops congenital varicella infection, when will his/her illness become clinically apparent?

First 10 days of life

If the mother develops varicella in the last 3 weeks of pregnancy, how likely is the fetus to develop varicella?

Quite likely – ¼ to ½ will contract the disease

What determines the severity of congenital varicella infection (mainly)?

When the mother is infected – ≤5 days before delivery is bad (no time for maternal antibody to be made & transferred)

What is the pattern of the rash seen in congenital varicella infection?

Centripetal but sparing extremities (centripetal = going toward the center of the body)

If the newborn does not have maternal antibodies to varicella, peripartum infection can be quite severe. How does varicella typically cause death?

Due to pulmonary involvement

If a mother develops varicella >5 days prior to delivery, should her infant receive immunoglobulin?

No – the infant is assumed to have already received maternal immunoglobulin

If VZ-IG is given empirically to a neonate, how long must the infant be kept in respiratory isolation?

28 days (immunoglobulin extends the incubation period)
| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| What is the other name for perleche?                                    | Angular cheilosis |
| What organism is generally responsible for perleche?                   | Candida (plus licking corners of mouth, braces, or bad overbite) In an older child or adult, consider staph aureus infection, iron or riboflavin deficiency |
| Are infants with thrush consistently symptomatic?                       | No – some are asymptomatic |
| A weepy and erythematous rash in skin folds, confluent, with a scaling edge suggests what problem? | Intertriginous candidiasis |
| How is intertriginous candidiasis treated?                              | Keep area dry + Nystatin cream (or other topical antifungal) |
| How is disseminated candidiasis treated?                                | IV amphotericin B × 6 weeks OR Fluconazole (static) & the newer “fungin” drugs (fungicidal) (Example: micafungin) |
| In settings of either immunocompromise or imbalance of bacteria, oral thrush often progresses to what difficult-to-manage problem? | Esophagitis |
| **Candidal infections regularly cause what secondary problem?**         | **Allergic reactions** (rash, itch, asthma, exacerbations, a type of colitis, etc.) |
| Scatter erythematous papules in the diaper area, or a confluent rash with a scalloped or a scaling border = ? | **Diaper dermatitis** (candida) |
| Is nystatin used to treat vaginal candidiasis?                          | No – use one of the “azoles” |
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Which famous fungus comes from the dry soil in the southwestern USA?   | Coccidioides                                                          |
| How long is the incubation period for coccidioides?                    | Up to 30 days                                                         |
| What is the common name for the illness it causes?                     | San Joaquin Valley fever or Desert Rheumatism (because it often causes joint pain & myalgias) |
| What is the usual course for a coccidioidomycosis infection?            | Asymptomatic pulmonary infections (60 %)                               |
| Which ethnic groups are especially likely to have bad episodes of coccidioidomycosis? | Hispanic, African American & Filipino                                  |
| Adults with symptomatic pulmonary coccidioidomycosis complain of hemoptysis. How do children present? | 1. Fever, cough, pleuritic chest pain  
  2. Arthralgia and myalgia  
  3. Night sweats  
  4. Maculopapular lower body rash |
| What finding on micro exam (from any source) suggests coccidioidomycosis? | Large “spherules”                                                     |
| A skin test (delayed-type hypersensitivity) is available to aid in the diagnosis of coccidioidomycosis. In what situation is the test often falsely negative? | Disseminated disease (due to anergy)                                   |
| How is disseminated coccidioidomycosis treated?                        | Ampho B, generally                                                     |
| If it is able to disseminate, where does coccidioides like to go?      | Bones & joints  
  Lymph nodes  
  CNS  
  Abdominal sites |
| Question                                                                 | Answer                                                                                                                                 |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| What causes Condyloma acuminata?                                        | HPV – human papillomavirus (aka papova viridae)                                                                                      |
| What is the histologic buzzword for condyloma?                          | “Koilocytosis” (& atypical nuclei)                                                                                                                                                             |
| koiilocytosis means an empty space near the nucleus                     |                                                                                                                                                                                                |
| How long can the incubation period for HPV last?                       | Several years                                                                                                                        |
| How common is HPV infection?                                            | Very common                                                                                                                                                                                       |
| (it is the most common STD – at least 20 % of sexually active women are infected) |                                                                                                                                                                                                |
| What easily accessed substance makes it much easier to visualize areas infected with HPV? | Acetic acid (leave on for 5 min – affected areas turn white)                                                                                |
| What is the usual course of HPV infection?                              | Like herpes, the immune system eventually keeps the virus from manifesting & may eliminate it                                         |
| Does genital Condyloma acuminata in a child indicate sexual abuse?      | Sometimes – It should always be investigated but close nonsexual contact can also transmit the virus                                    |
| A vaccine for HPV infection is now available. What is the main restriction on who can get the vaccine? | It is given to patients between the ages of 9 and 26 years old (target age for vaccination is 11–12 years old) |
| Is HPV vaccination useful for boys, as well as girls?                  | Yes – The quadrivalent vaccine prevents infection with strains linked to genital cancers in males                                      |
| What is the other name for neonatal conjunctivitis?                    | Ophthalmia neonatorum                                                                                                                 |
| Does GC conjunctivitis lead to blindness?                              | Yes, without prompt therapy                                                                                                              |
Why must conjunctivitis never be treated with steroid drops by a primary care doctor? Could accelerate an undiagnosed herpes keratitis

What is the buzzword for herpes keratitis on physical exam? “Dendritic” (branching) pattern of fluorescein uptake

What is the other name for croup? Laryngotracheobronchitis

What causes croup? A variety of viruses (the symptom constellation defines the disorder rather than the causative agent)

What three symptoms characterize “croup”? 1. “Barky” cough 2. Inspiratory stridor 3. Hoarseness

How is “spasmodic croup” different from regular croup? 1. It occurs only at night 2. Child appears well (or minimally ill)

During what season is croup most often seen? Winter

What is the typical age & gender for a croup patient? <3 years (usually 2) and male

What is the buzzword for croup on X-ray, and why does it occur? • “Steeple sign” • Subglottic narrowing due to inflammation near the cricoid

What diagnostics are useful for croup patients? Pulse ox (r/o hypoxia) & AP & lateral neck X-ray

In addition to “steeple sign”, what else should you be looking for on X-ray if you suspect croup? 1. Foreign body 2. The “thumb” of epiglottitis 3. Retropharyngeal infection or abscess

For croup patients requiring medical intervention, what therapies are useful? 1. Racemic epi (nebulized) 2. Steroids (usually a single dose of dexamethasone – 45 h $T_{1/2}$)
What simple interventions have long been thought to improve symptoms in croup patients, although recent data does not support this? 

Humidified air & Cold air

How long must you observe a patient who requires racemic epi treatment for croup, before discharging to home? 

At least 4 h after treatment (some patients rebound & worsen after treatment)

Recurrent croup suggests that a child may be suffering from one of the two underlying disorders. What are they? 

1. Subglottic stenosis/congenital anomaly 
2. GE reflux

Cryptococcus usually affects what organ system? 

CNS (occasionally lungs & other areas)

How is cryptococcal meningitis treated? 

Amphotericin B + Flucytosine (6 weeks)

Recurrence of cryptococcal meningitis is common. How do we prevent this in the immunocompromised? 

Maintenance fluconazole

What is the prognosis for cryptococcal meningitis (properly treated)? 

Very good 
(Fatal without treatment, by the way)

What special CSF tests should be done if cryptococcal meningitis is suspected? 

(2) India ink stain & Cryptococcal antigen

Where is Cryptococcus neoformans found in nature? 

Pigeon droppings & soil

Are immunocompromised hosts at risk for cryptococcal recurrences? 

Yes (at least 1 year of regular follow-up is required)

What are the two common presentations of pulmonary cryptococcosis? 

Asymptomatic & Cough & hemoptysis
| Question                                                                 | Answer                                                                 |
|--------------------------------------------------------------------------|------------------------------------------------------------------------|
| What are the symptoms of cutaneous larva migrans?                        | Itching & serpiginous erythematous lines (serpiginous = snakelike)       |
| What usually causes cutaneous larva migrans?                             | Hookworms in the wrong host                                             |
| What is the incubation period for cutaneous larva migrans?               | 7–10 days                                                              |
| What disease related to cutaneous larva migrans develops after swimming in filariaform-infested waters? | Swimmer’s itch                                                        |
| How is cutaneous larva migrans treated?                                  | Topical or oral thiabendazole (will spontaneously resolve but is very annoying to the patient) |
| Two types of bacteria cause the clinical illness known as Ehrlichiosis. Which two bacteria are they? | Anaplasma phagocytophilum & \(Ehrlichia\) chaffeensis (Both gram-negative intracellular coccobacilli) |
| What makes the two Ehrlichia bacterial species so unusual?               | They live within the phagosomes of immune cells                          |
| Which TWO types of immune cells are affected in Ehrlichiosis?            | Granulocytes with Anaplasma infection & Monocytes with \(E.\) chaffeensis infection |
| Anaplasmosis is an alternative name for which disorder?                  | Ehrlichiosis due to Anaplasma – It is also known as human granulocytic anaplasmosis (HGA) |
| The vector & geographic distribution of disease are the same for Lyme disease & which form of Ehrlichiosis? | Anaplasma phagocytophilum Ehrlichiosis |
| Geographically, where does the other form of Ehrlichiosis mainly occur? | Southeast, South central, & Midatlantic USA – Lone Star tick vector \(Amblyomma\) americanum \()}
| Question                                                                 | Answer                                                                                           |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| What makes the two Ehrlichia bacterial species so unusual?              | They live within the phagosomes of immune cells.                                                   |
|                                                                       | *(Gram-negative, intracellular coccobacilli)*                                                   |
| What unusual micro finding is reported after about a week of Ehrlichiosis infection? | Intracellular inclusions in a mulberry or a morula shape – it is lots of tiny bacteria multiplying in the cell! |
|                                                                       | *Diagnostic for Ehrlichiosis!!!*                                                                 |
| How is Ehrlichiosis acquired?                                          | Tick bite.                                                                                        |
|                                                                       | *(In the USA – mainly Ixodes scapularis & pacificus for Anaplasma, Amblyomma for E. chaffeensis)* |
| Is Ehrlichiosis seen outside the USA?                                  | Yes – The Anaplasma type is seen in Europe & Asia & other species cause Ehrlichiosis elsewhere    |
| What lab abnormalities do you expect to see in the CBC of an Ehrlichiosis patient? | 1. Leukopenia  
2. Thrombocytopenia  
3. +/- anemia                                             |
| What non-CBC lab abnormalities are expected in Ehrlichiosis?           | ↑ LFTs (usually ALT)  
&  
Hyponatremia                                                          |
| What is the drug of choice for Ehrlichiosis?                           | Doxycycline  
(at least 7 days – alternative is chloramphenicol)                                           |
| What other infectious disease sometimes co-occurs with Ehrlichiosis?   | Lyme disease  
(titers should be sent)                                                            |
| What is the most common chief complaint in children presenting with Ehrlichiosis? | **Bad headache**                                                                                   |
| Which patients are at special risk for more severe Ehrlichiosis?       | Asplenic & immunocompromised patients  
(RMSF-type presentation)                                                                               |
| Where does CMV hide when it is in a latent stage?                      | Peripheral monocytes                                                                               |
What is the hallmark of CMV infection on microscopic exam?  
(2) Very large cells & Intranuclear inclusion bodies

In utero CMV infection is the most common cause of which congenital problem? Congenital deafness

Which body systems can CMV affect – especially in the immunocompromised? Essentially all of them

What medication may be used to treat CMV? Ganciclovir (Foscarnet is second line currently)

Which medication is currently the mainstay for CMV prevention in transplant patients, & in treating CMV retinitis? Valganciclovir

What effect do CMV medications have on the virus? They are static only

How common is it for asymptomatic individuals to shed CMV in body secretions? Very common

In the USA, approximately how common is CMV exposure? Approximately 50% of the population (these individuals often continue to shed the virus)

What is the main problem caused by cryptosporidiosis? Secretory diarrhea

What is cryptosporidiosis? A protozoan spread via fecal-oral contamination (human or animal)

Which patients have the greatest difficulty with cryptosporidial infection? Immunocompromised & Kids <5 years

Although there is no entirely effective treatment for cryptosporidiosis, which medication is considered to be the drug of choice? Nitazoxanide (used with immunocompromised patients) (Paromomycin +/- azithromycin is still sometimes used, but is less effective than nitazoxanide)
### General Infectious Disease Question and Answer Items

**What unusual source is sometimes the vector of infection for cryptosporidiosis?**

*Apple cider* (unless it is pasteurized – crypto lives well in apple cider for a month!)

(Remember that EHEC is in apple *juice*)

**How can public or private water supplies be protected from cryptosporidial contamination?**

*Filtration systems*

**How is cryptosporidiosis definitively diagnosed?**

Oocysts in stool

(often hard to find, must send 3 specimens from 3 different days, minimum)

**Which viral group most commonly causes hand–foot–mouth disease?**

*Coxsackie viruses*

**What feature of hand–foot–mouth causes the biggest problem?**

“Vesiculoulcerative” stomatitis – may produce dehydration

**What is the usual pattern for development of hand–foot–mouth diseases?**

Oral ulcers, then,

Papular or vesicular exanthem on hands/feet (non-tender, non-pruritic)

**Although lidocaine (viscous) is sometimes given with other ingredients as a mouthwash to relieve oral pain, why can this be a dangerous practice?**

Direct absorption from mucous membranes skips the “first pass” effect & can deliver a fairly sizable lido dose (*→arrhythmias*)

**Which two viruses typically cause a macular rash on the palms & soles?**

*Echovirus 16 (Boston exanthem)*

&

*Coxsackie virus*

**Where, specifically, does herpes hide when it’s latent (not active)?**

*Sensory neural ganglia* (hence the paresthesias that often precede an outbreak when it starts “creeping out”)

**Does neonatal HSV infection require contact with a herpes lesion to develop?**

*No!*

(only 25 % of mothers with affected infants have a history of or current infection with HSV, and some c/s infants still develop HSV)
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| Will a patient with herpes encephalitis have skin or mucous membrane/oral lesions? | No                                                                     |
| Does c-section delivery prevent transmission of herpes to the neonate?   | No                                                                     |
| (although it is still standard of care if lesions are present)          |                                                                        |
| What is the buzzword for herpes infection on micro preparation?         | Multinucleated giant cells                                              |
| How is HSV encephalitis definitively diagnosed?                         | Brain biopsy or PCR of CSF                                              |
| What will the CSF profile of a patient with herpes encephalitis usually look like? | 1. WBC pleocytosis – mainly lymphs  
2. High protein  
3. High RBCs (even without trauma, due to hemorrhagic necrosis) |
| Are CSF viral cultures for HSV useful?                                  | Usually not – Often negative even with clear HSV infection             |
| What is the preferred imaging study for suspected HSV encephalitis?     | MRI                                                                    |
| How are serious herpes simplex infections treated?                     | IV acyclovir for 21 days                                               |
| (vidarabine is sometimes added for encephalitis)                       |                                                                        |
| Medical professionals are at risk for herpes in unusual locations if they fail to use universal precautions. What is the most common site for the “occupationally exposed” to have a lesion? | Fingertip – aka “Herpetic Whitlow”                                     |
| What sport is associated with herpes outbreaks on unusual portions of the body? | Wrestling – They have many abrasions & pick it up from the mat        |
| What is the most common complication of long courses of acyclovir in young children? | Neutropenia (25 % with 6 months of use)                                |
Where does Hantavirus come from in nature?  Rodents

How do humans become infected with Hantavirus?  Inhalation of dried excretions/secretions

What age groups are most commonly affected by Hanta pulmonary syndrome, & Hanta infection generally?  Children & healthy young adults

Are the rodents that carry Hantavirus ill appearing?  No – they have a chronic infection

What are the main clinical features of Hanta pulmonary syndrome?  
(2)
1. Respiratory failure (alveoli fill with protein-rich fluid)
2. Cardiac depression (low cardiac output with high vascular resistance)

What are the typical activities associated with catching Hanta infection?  Sweeping, cleaning, or construction in a rodent-infested building

What symptoms often occur in the early stages of Hanta infection?  
• Fever
• Myalgia & headache
• GI distress (n/v/d & pain)

Is cough common in the early stages of Hanta infection?  No – it comes just before the very serious phase (pulmonary edema and cardiac suppression)

Will you see an enlarged cardiac silhouette in Hanta pulmonary syndrome?  No – The CXR looks like CHF, but this is due to profound leakiness mainly, not cardiac dilation

Which lab values can be a clue to the presence of Hanta, if followed over time?  
(3)
1. The platelet count (it falls during the prodrome)
2. Immature WBC forms are seen in the peripheral blood
3. IgM to Hanta will be present

Can Hantavirus spread from person to person?  Generally, no  (one S. American type can, but it is not likely to be on the boards)
If patients survive the shock phase of Hanta pulmonary syndrome, what is the usual prognosis? Good (some residual pulmonary problems may persist but they are mild)

What is the usual cause of impetigo? Staph aureus

What are the two forms of impetigo? Bullous & Non-bullous (this one more likely to be caused by other organisms, mainly GABHS, in addition to S. aureus)

How does impetigo cause infection? Bacteria invade the skin at points of minor trauma

In Fitz-Hugh-Curtis syndrome, what is the problem with the right upper quadrant? Perihepatitis (infection around the liver capsule, not in the liver itself, usually coming from a gyn source)

“Early” infection with Group B Strep produces what sort of neonatal infection? Sepsis in the first week of life

What factors, related to the birth itself, make Group B Strep infection more likely? 1. Younger age 2. Lower SES 3. Multiple sex partners 4. History of STDS

If microabscesses are seen on the internal organs of a septic newborn, what is the likely cause of the sepsis? Listeria monocytogenes

If the mother of a septic newborn has had “flu-like symptoms,” what is the likely cause of the infant’s sepsis? Listeria

If the mother of a septic infant was asymptomatic during pregnancy/delivery, what is the likely cause of the infant’s sepsis? Group B strep (don’t forget N. meningitis is also a possibility)
In adolescents, how is PID usually treated?  
Inpatient, due to risk to fertility if compliance is poor  
(usually gentamicin + clindamycin – both meds have “mice” in the name)  
Outpatient treatment is also acceptable, if the adolescent meets criteria for outpatient treatment, including likelihood of compliance

How does an osteomyelitis from pseudomonas get started?  
Classically, the vignette will be a nail through a sneaker (rubber sole)

Which other patient groups are likely to develop pseudomonal infections?  
1. Burn patients  
2. Mechanically ventilated (waterborne)  
3. CF  
4. Leukemia

In otherwise healthy folks, what pseudomonal infection is fairly common?  
Otitis externa

Which cephalosporin is frequently used against pseudomonas?  
Ceftazidime

A child who becomes sick while staying on a dairy farm (fevers, myalgia) may have what dairy-related disorder?  
Brucellosis  
Mnemonic: Picture a cow saying “BRUUUCE” instead of “MOOO!”

An STD + arthritis or multiple skin nodules = what diagnosis?  
Gonorrhea

Arthritis + right upper quadrant tenderness in a female = what diagnosis?  
Gonorrhea – specifically Fitz-Hugh-Curtis syndrome

Since botulism is caused by a bacterium, why don’t we treat it with antibiotics?  
(3 reasons)  
1. The toxin is the problem, not the bacteria  
2. Killing the spores may result in increased toxin release in the gut (infant botulism)  
3. Some antibiotics actually make the effects of the toxin worse
How does botulism cause problems?  
It blocks release of Ach

If you give the “tensilon test” to a botulism patient, will it be positive?  
No – it is positive in myasthenia gravis  
(tensilon inhibits acetylcholinesterase, but that doesn’t help if there’s no ACh)

How does botulism cause problems for children & adults?  
Preformed toxin is ingested (usually from canned goods)

How is infant botulism different from the disorder seen in children and adults?  
Spores are ingested, these grow in the gut, then release toxin  
(Doesn’t happen in older children, because gut flora prevent significant growth by the botulinum spores)

An infant with poor feeding, ptosis, and/or descending paralysis most likely has what disorder?  
Botulism  
(even if honey ingestion is not mentioned)

If an infant’s mother has a history of syphilis – properly treated – does the newborn infant require treatment?  
No – but IgG titers should be followed & they should fall over time if the antibodies came from the mom

If a mother is being treated with penicillin for syphilis, will her in utero fetus be treated at the same time?  
Yes – PCN crosses the placenta!

A newborn with a maculopapular rash, hepatosplenomegaly, and “peeling skin,” is likely to have what disorder?  
Syphilis

Which test is more specific and reliable when you are looking for possible syphilis – VDRL or FTA-Abs?  
FTA-Abs – (fluorescent treponemal antigen antibodies – this test remains positive for life)

If a patient sustains a “dirty wound,” how do you know whether a tetanus booster is needed?  
If it is more than 5 years from the child’s most recent booster (or original immunization) a booster is needed
In addition to obviously dirty wounds, what three other important categories of wounds are considered to be dirty?  

1. Crush injuries  
2. Burns  
3. Frostbite  

If a child has a “clean” wound, how do you know whether a tetanus booster is required?  

>10 years since last immunization  

What bacterium is especially associated with hemolytic uremic syndrome (HUS)?  

*E. coli* (especially 0157:H7)  

Vignettes in which the child has consumed spoiled milk or undercooked beef are likely to involve what bacterium?  

*E. coli*  

(Think of that unfortunate fast food incident a few years back . . . in which several children died due to contaminated burgers!)  

What is one simple way to differentiate staph scalded skin syndrome from the erythema multiforme group of disorders?  

Staph scalded skin should *not* involve the mucosa  

What is toxic epidermal necrolysis (TEN) caused by?  

Hypersensitivity reaction (*not* a toxin) – usually it’s a reaction to medication  

What causes staph scalded skin syndrome?  

*Exotoxin* from particular Staph bacteria  

What causes toxic shock syndrome?  

Toxin-producing Staph (occasionally strep can do it also)  

If you are treating a patient for Strep who is PCN allergic, what other medication can you use?  

Clindamycin  

What is the drug of choice for tularemia?  

Streptomycin  

(Gentamicin is an acceptable alternative)  

How is tularemia acquired on the boards?  

Boards – involvement with rabbit meat or skinning  

(REAL LIFE – mainly tick-borne)  

Burn patients are especially at risk for what *fungal* infection?  

Candidiasis
Burn patients are especially at risk for what bacterial infection?  
\[ \text{Pseudomonas} \]

Patients on TPN are especially likely to develop what fungal infection?  
\[ \text{Candidiasis} \]

What virus likes to cause viral meningitis during the summer months?  
\[ \text{Enterovirus} \]
(\text{also causes rash & high fever})

If a child has a swollen parotid gland, but is fully immunized, what causes should you think of?  
\[ \begin{align*} 
(4) 
\end{align*} \]

1. \text{Obstructing stone}  
2. \text{Bacterial infection} (toxic appearance)  
3. \text{Viral infection}  
4. \text{Bulimia, if it’s bilateral}

If a child has not completed his or her immunizations, or has come to the country from abroad, and has swollen parotid glands, what disease should you consider?  
\[ \text{Mumps} \]

What is the “formal name” for roseola?  
\[ \text{(it’s often listed this way in answer choices)} \]
\[ \text{HHV-6} \]
(\text{Human herpesvirus type 6})

What is the typical pattern seen in roseola infection (usual clinical course)?  
\[ \begin{align*} 
1. & \text{3–5 days’ high fever} \\
2. & \text{Maculopapular rash when the fever ends} \\
3. & \text{Complete recovery} 
\end{align*} \]

What is the formal name for the type of measles associated with birth defects?  
\[ \text{Rubella – also known as German measles} \]

Mnemonic:  
Imagine an infant speaking German wearing a “bell” that hangs over her heart. The bell is to warn others when she’s coming, because she often bumps into things, due to poor vision (cataracts)

If a pregnant mother is found to be measles (rubella) non-immune, should you give the vaccine?  
\[ \text{No – it is a live vaccine & can cause problems itself} \]
What two defects are seen most commonly in infants affected by rubella?

PDA (other heart issues) & Cataracts

Regular measles (rubeola) has an average incubation period of one to one-and-a-half weeks. When are patients most likely to be contagious?

5 days before until 5 days after the rash first appears

In what age group is measles (rubeola) most often seen?

Preschool

How is rubeola spread?

Contact with secretions & Aerosolized droplets inhaled

Is measles (rubeola) seen in native-born US children?

Yes

What are the buzzwords for the classic measles (rubeola) presentation?

Fever, Cough, Coryza, Conjunctivitis, Cutaneous rash (+/- Koplik spots in the mouth)

Should HIV patients receive the MMR (live) vaccine?

Yes – the risk of the diseases is worse than the risk of the immunization

If an infant is exposed to rubeola, what should be done?

1. Give MMR within 3 days of exposure (Mnemonic: 3 letters in MMR means you have 3 days)
2. Give immunoglobulin within 6 days of exposure

If an infant has received rubeola immunoglobulin, does that change the protocol for MMR vaccination?

Yes – in addition to the initial vaccine, another dose should be given in 5 months

If a child receives the MMR before he or she is 1 year old, is reimmunization needed?

Yes – when the child is more than 1 year old
### General Infectious Disease Question and Answer Items

| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| In addition to supportive care, what specific intervention is recommended for a child with measles by WHO, regardless of the country of origin? | Vitamin A (one dose on two consecutive days, to reduce possible complications) |
| If a child has a known exposure to a bat, but there was no bite or other contact, is any intervention needed? | Generally, yes – Especially if the exposure was in an enclosed space – Immunize & give IgG for rabies |
| Do rodents carry rabies?                                                | No – Do not immunize for squirrel bites, etc. |
| Which animals are *most likely* to carry rabies in North America?      | Bats, fox, skunks, raccoons (local patterns vary) |
| If the patient was bitten by a domestic animal, should rabies prevention treatment be started? | No, if 1. the animal has proof of immunization or 2. the animal can be observed for signs of illness for 10 days, and 3. the bite was not to the head (a bite on the head would require treatment, even if the animal is being observed) |
| If a child is bitten by a possibly rabid animal, how should the child be treated? | 1. Human rabies immunoglobulin is injected at the site of the bite 2. Series of 4 rabies vaccinations should be started (note that this is a CHANGE from the previous 5) 3. Wash & debride wound |
| Why are unprovoked animal bites more worrisome for rabies, than those that occur when the patient was interacting with the animal? | Unprovoked = higher probability the animal is rabid |
| Why are bites that occurred in areas closer to the brain more likely to cause problems, in terms of rabies? | The virus migrates along the nerves to the brain – the shorter the distance, the faster it arrives! |
| Is rabies common in animals in other parts of the world?                | YES – very common! |
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Are travelers at increased risk for rabies, if they are not specifically working with animals? | YES – dogs are the most common source for rabies amongst travelers & contact with animals in public areas is enough to contract the disease! |
| If a patient returns after a trip, and was bitten by a dog but didn’t receive rabies prophylaxis, should you still give it? | YES – The incubation can sometimes last a long time, and even partial immunization increases chances of survival |
| If your patient contracts rabies, can it be treated?                   | Not really – There are some experimental protocols, but it is essentially 100% fatal |
| What is the histopathological “buzzword” for rabies infection in the CNS? | “Negri bodies” are seen – dark inclusions in brain neurons |
| Seizure in the first 4 weeks of life, especially if it involves the temporal lobe or the CSF has no organisms on Gram stain, should make you consider what organism? | HSV |
| Is it safe for HIV-infected moms to breastfeed?                        | No – in developed countries, the risks outweigh the benefits |
| What is the most common deep infection of the head and neck, and which age group tends to get it? | Peritonsillar abscess – Young adults & adolescents |
| Aside from the patient’s discomfort, what is the most concerning aspect of a peritonsillar abscess? | Spread to the adjacent tissue planes producing 1. serious infection & 2. airway compromise |
| What is the most common organism found in retropharyngeal abscesses?   | β-Hemolytic strep |
| At what age does retropharyngeal abscess typically occur?              | 6 months to 3 years |
### How does retropharyngeal abscess present?
- Fever
- Ill to toxic appearing
- Stridor
- Dysphagia
- +/- Drooling
- Refusal to eat
- Little movement (it hurts)

### What is the most feared complication of lateral pharyngeal space infections?
- Septic thrombophlebitis of the jugular vein
  - *(Lemierre’s syndrome)*

### What is the usual bacterial agent in Lemierre’s syndrome?
- Fusobacterium
  - (others are possible, and is often polymicrobial)

### A teenager presents with a sore throat, but seems genuinely ill, with fever & rigors. What serious disorder should you consider?
- Lemierre’s syndrome
  - *(admit – IV antibiotics!)*

### If a child develops pneumonia following an episode of the flu, what is the likely organism?
- Staph aureus

### Would oral Augmentin® (amoxicillin/clavulanate) be an acceptable way to treat staph aureus pneumonia?
- Usually

### When is it not alright to treat staph aureus with oral Augmentin®?
- If the patient is bacteremic (or otherwise very ill – or allergic, of course)

### What are the most likely organisms for CNS shunt infections?
- (2)
  - Staph aureus
  - Staph epidermidis

### Osteomyelitis, on the peds boards, will normally be caused by what organism?
- Staph aureus

### Osteomyelitis that follows stepping on a nail, after it goes through your tennis shoe, will give you what type of osteomyelitis on the boards?
- Pseudomonas
Patients with sickle cell disease are more likely than average (very likely on the boards) to develop osteomyelitis due to what organism?

Children with cyanotic congenital heart disease are at increased risk for what very unusual ID problem?

What is the typical organism seen with the abscesses of congenital heart disease patients?

What is the drug of choice for MRSA bacteremia?

Staph aureus is well known for causing what three skin disorders?

Bacteremia in an IV drug abuser or dialysis patient will be due to what organism, on the boards?

Shock + rash on the boards usually =

If you see MRSA in outpatients (such as from a furuncle or carbuncle), how should you treat it?

If you have an MRSA + infection in an outpatient who is also blood culture + for MRSA, how should you treat it?

If a device has recently been implanted in a patient who later develops toxic shock syndrome, what are the two main actions that must be taken?

In addition to Staph aureus, what other organism is especially associated with toxic shock syndrome?
If a patient develops toxic shock syndrome, and has a positive blood culture, what is the organism?  
**Staph aureus**

If a patient develops toxic shock syndrome, and blood cultures are negative, what is the organism?  
**Strep pyogenes**

Is it alright to treat a staph species with vancomycin if it is sensitive to β-lactams?  
No! (too expensive, often less effective in these bugs, & it risks creating vanc-resistant bugs for no reason)

What organism is the most common cause of catheter-related bacteremia?  
**Staph epidermidis**

What organism is the most common cause of bacteremia in patients who have had medical devices implanted?  
**Staph epi (epidermidis)**

How is Staph epidermidis treated?  
Vancomycin or a β-lactam, if sensitive

Are there any special situations when you should consider giving more than “just” vancomycin for a methicillin-resistant staph strain?  
Yes – May add gentamicin or rifampin for endocarditis  
Rifampin alone may be added in cases of CNS or osteomyelitis infection

What is the only case in which you should automatically add both rifampin & gentamicin to vancomycin, to treat MRSA/E?  
Endocarditis involving a prosthetic valve

Which other medication is generally acceptable to use for MRSA/E, in place of vancomycin?  
**Daptomycin** (lower dose for kids <12 years old)

If no intravascular or bacteremia-type illness is suspected, what alternative drugs may be used to treat methicillin-resistant staph species?  
**Clindamycin & Linezolid**

Can Staph epidermidis ever be safely considered a contaminant?  
Yes – well-appearing child and one culture bottle positive only
What does the rash of toxic shock syndrome look like?

Sunburn –
Light red all over, then it peels (desquamates)

What unusual parts of the body are involved in the desquamating rash of TSS?

Palms & soles

If a NICU baby has one culture bottle positive for Staph epi, and the other bottle is negative, is it alright to consider it a contaminant?

No (NICU babies are too unpredictable)

How should you treat Strep pneumo meningitis – initially, before the cultures come back?

(Vancomycin + 3rd-generation cephalosporin)

(Popular test item!)

If a sensitivity for Strep pneumo comes back saying that it has “intermediate resistance” to PCN, how should you treat the infection?

Vancomycin + 3rd-generation cephalosporin

If sensitivities on Strep pneumo come back as “highly resistant” to PCN, how should you treat the infection?

Vancomycin + 3rd-generation cephalosporin

Why is Strep pneumo such an important bug?

It is the most common bacterial cause of most of the important peds infectious diseases (OM, pneumonia, meningitis, bacteremia)

Which kids are most likely to be harboring resistant strep pneumo in their ears?

(4 factors)

1. Recent antibiotic use
2. Recurrent OM
3. Daycare kids
4. <2 years old

If a child is likely to have resistant OM, what should you treat him or her with?

80–90 mg/kg/day amoxicillin

If in an occult bacteremia case, if a blood culture comes back positive for Strep pneumo, what should you do?

Call to check on the child – if sick, call in Abx, if not sick, do nothing
Now that the pentavalent pneumococcal vaccine is routinely administered, how common is the dreaded Strep pneumo bacteremia?

Very uncommon (approximately 0.3% of febrile children meeting the rule-out bacteremia criteria)

On the boards, how do you diagnose a child with exudative tonsils as having strep throat?

Rapid strep + throat culture (if the rapid strep was negative)

When is pharyngitis not likely to be due to strep infection, just based on clinical findings?

If there is cough, rhinorrhea, or other URI symptoms

If a throat culture comes back positive for strep after the rapid strep was negative, should you have the child come in for a follow-up visit?

No – just call in Abx after notifying the caregiver

What kind of strep normally causes strep pharyngitis?

Strep pyogenes (Grp A strep)

In infants with pharyngeal group A Strep, what are the symptoms? (4)

1. Thick, purulent nasal discharge
2. Low-grade fever
3. Decreased feeding
4. Vomiting/abdominal pain

Should infants routinely be checked for group A Strep infection, if they have some matching symptoms?

No – <18 months should be tested only if there is a Strep-positive contact

(positive test due to colonization without disease is also possible)

What is scarlet fever?

Strep throat with a rash (yes, that’s all it is)

Why do some patients get a rash with strep throat, & others do not?

It comes from an exotoxin, & only certain streps make it
| Question                                                                 | Answer                                                                                     |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| What do you need to know about the appearance of the scarlet fever rash? | (3 main things) 1. Feels like “sandpaper” 2. Prominent in flexor skin creases 3. “Pastia’s Lines” are pathognomonic (lines of erythema in flexor creases) |
| How is erysipelas different from other staph/strep skin infections?     | 1. It is tender 2. Usually systemically ill 3. All skin layers & underlying tissues are involved 4. Deep red with a sharp margin |
| On the boards, how might you want to culture for the Strep pyogenes that causes erysipelas? | “Leading edge culture” (use a syringe to inject a little saline into the skin of the leading edge, pull back, & culture) |
| Which type of Strep pyogenes skin infection requires surgical debridement? | Necrotizing fasciitis (“flesh-eating bacteria”) |
| What is the treatment for necrotizing fasciitis?                        | 1. *Surgical debridement* 2. Antibiotics (PCN and clinda IV, sometimes additional antibiotics until susceptibility is determined) |
| What treatment for necrotizing fasciitis shows promise, but remains controversial? | Hyperbaric oxygen |
| IVIG is sometimes with which type of necrotizing fasciitis?             | Streptococcal toxic shock syndrome (less useful in children than adults, though, due to lesser mortality in children) |
| A child with shock and a rash, but no petechiae has what disorder?       | Toxic shock syndrome |
| True or False – rheumatic fever can only develop from pharyngeal group A Strep? | True |
| Question                                                                 | Answer                                                                                                                                 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Should all Strep pharyngitis be treated with antibiotics?               | Yes – to shorten the course & prevent rheumatic fever                                                                                |
| Do all types of Strep pharyngitis have the potential to cause rheumatic fever? | No – only group A Strep can do it                                                                                                  |
| Does antibiotic treatment of group A Strep prevent post-strep glomerulonephritis from happening? | No (not even a little bit)                                                                                                           |
| Can post-strep glomerulonephritis develop after a skin infection with GAS, or only after pharyngitis? | Either one!                                                                                                                           |
| What is the other name for group B Strep?                               | Strep agalactiae (galacto means milk and “B” stands for bovine cow)                                                                |
| Why is the heart affected in rheumatic fever?                           | “M” proteins of certain Strep bacteria generate a strong antibody response – and those antibodies are cross-reactive against (all sorts of) cardiac tissues |
| What is REQUIRED for diagnosing rheumatic fever?                        | Proof of Strep infection (positive culture, ASO titer, anti-hyaluronidase or anti-deoxyribonuclease B)                                 |
| What are the major (Jones) criteria for rheumatic fever?                | CHorea Arthritis (polyarthritis) Nodules (subcutaneous) Carditis Erythema marginatum (Mnemonic: CHANCE – You won’t have a chance in life without good heart valves!) |
| How many major & minor criteria are required to make the rheumatic fever diagnosis? | 2 major Or 1 major & two minor                                                      |
What are the *minor* (Jones) criteria?

- Fever
- Arthralgia
- Prolonged P-R interval
- Prior rheumatic fever or heart disease
- Elevated acute-phase reactants (ESR/CRP, leukocytes, etc.)

If you suspect rheumatic fever, and obtain a throat culture, what is the likely outcome?

Cultures are usually negative by the time rheumatic fever has developed.

If your patient presents with strep throat, & you do a rapid Strep test (rapid antigen detection test), what should you know about the sensitivity & specificity of the test?

The specificity is good! (>95 %)
The sensitivity is just moderate, though (around 75 %) – so get a throat culture also, even if negative!

Why is it important to isolate the Strep organism involved in a Strep throat infection?

(2 reasons)
- To confirm the Strep infection
- To type the organism (more information about the risk for rheumatic fever, etc.)

Which serological tests are useful to support a diagnosis of rheumatic fever, & when should you be able to obtain a positive result?

There are many – most common are ASO (antistreptolysin O), anti-DNase B, antihyaluronidase, antistreptokinase

They rise in the first month after Strep infection & should be present if rheumatic fever is present.

When does ASO titer peak, & how sensitive is it?

2–3 weeks after rheumatic fever onset
Sensitivity about 85 %

Is group A Strep the only one that produces elevated ASO titers?

No – Groups C & G do, too

What does GBS cause in pregnant mothers?

UTIs + asymptomatic colonization of the vagina/anus

Is group B Strep a likely cause of meningitis occurring in the first 7 days of life?

No – it usually causes septicemia & pneumonia in the “early-onset” period.
| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| Early-onset GBS is especially likely to affect which infants?           | – Premature  
|                                                                         | – Mom had obstetrical complications |
| “Late-late”-onset GBS infection occurs at what age?                      | >3 months |
| Which infants typically develop late-late-onset GBS?                    | Preemies who have, or used to have, IV lines |
| What kind of infection does late-late-onset GBS usually cause, and how bad is it? | – Bacteremia without a focus  
|                                                                         | – <1 % fatality rate |
| When is GBS most likely to cause meningitis?                            | Late onset  
|                                                                         | (7 days – 3 months) |
| What percentage of meningitis in children 7 days to 3 months old is due to GBS? | 40 % |
| Which GBS serotype is usually involved in late-onset GBS infection?     | TYPE III (90 %)  
|                                                                         | Mnemonic:  
|                                                                         | 3 months – Type III |
| If an infant develops meningitis in the first week of life, is it very likely to be GBS meningitis? | No |
| Osteomyelitis is typically caused by Staph aureus. For what age group is this not true, and what is the common organism? | – 7 days to 3 months  
|                                                                         | (late-onset GBS)  
|                                                                         | – GBS |
| What is the gold standard for diagnosing GBS infection in infants?      | Positive blood culture |
| Can antigens be used to diagnose GBS infection?                         | Yes – only if  
|                                                                         | 1. infant has been on antibiotics  
|                                                                         | 2. serum or CSF is used |
| Which body fluid must not be used to diagnose GBS infection?            | Urine (not at all reliable) |
| (based on antigens)                                                     |        |
If GBS causes osteomyelitis or septic arthritis, how should you treat that? 4-week IV antibiotics (usually PCN)

IV treatment of serious GBS infections usually begins with what drug combo? IV PCN + gentamicin

How long is the treatment regimen for pneumonia/sepsis due to GBS? 10 days
(Start with PCN + gent, then just PCN)

How long is the treatment regimen for GBS meningitis? 14 days minimum

So, if an infant is diagnosed with GBS osteomyelitis, what is the treatment regimen? IV PCN + gentamicin initially, then IV PCN ×4 weeks

How is the treatment regimen different for GBS sepsis and GBS meningitis, compared to GBS septic arthritis or osteomyelitis? Same drugs, but meningitis is 14 days (minimum), sepsis is 10 days, arthritis is 4 weeks

Which enterococci infect humans? *E. faecalis and E. faecium*

Enterococcal infections are most often seen in which pediatric patient group? Newborns
(UTI, abdominal infection, bacteremia)

Enterococci are particularly fond of infecting which sorts of foreign objects in the body? VP shunts in kids (meningitis & ventriculitis)
Indwelling urinary catheters
Central venous lines in neonates

Enterococcal neonatal sepsis has increased over the last 30 years. How common is it as a cause of neonatal bacteremia & sepsis? Roughly 10 %
(according to most recent data available)

Which enterococcus causes most neonatal infection? *E. faecalis*

How are enterococci treated? PCN or ampicillin if sensitive

Why is it so important to check sensitivities on enterococcal infections? To identify vanc-resistant enterococcus (VRE)
If a boards question asks whether you would like to get sensitivities on an enterococcal infection, what is the correct answer?
Yes (they want to know you are aware of VRE)

If a boards question offers you a 3rd-generation cephalosporin to treat enterococcus, is that a reasonable choice? (Popular test item!)
No – it will not treat enterococcus

What can you use to treat VRE?
Linezolid or daptomycin

If an enterococcal infection is sensitive to ampicillin, why might you choose to add a medication to the ampicillin regimen?
For synergy in bad infections, an aminoglycoside will help to kill enterococci, rather than just inhibit their growth (Amp & PCN are static antibiotics against most enterococci!)

If your patient has an enterococcal UTI, what should you check?
US for underlying abnormalities – enterococcal UTIs are associated with a higher than usual rate of underlying urinary tract abnormalities

Which peds patients are at risk for Listeria infections?
Mainly newborns (+ any institutionalized patient)

Where do infected newborns encounter Listeria?
Colonized moms

In the environment, where might your patients contact Listeria?
Sheep, goats, poultry, & contaminated milk products

What is an especially classic exposure for Listeria? (popular test item)
Goat cheese from California or Mexico!

If Listeria appears in a blood or a CSF culture, should you consider it a possible contaminant?
No (not in a kid <3 months old, at least)

Can you treat Listeria with a 3rd-generation cephalosporin?
No (Listeria & enterococcus are treated with ampicillin!)
If your patient is “penicillin allergic,” how can you treat a Listeria infection?  
Vanc or TMP/SMX

If a blood or a CSF culture comes back as “diphtheroid” organism, should you figure it’s a contaminant? If not, why not?  
– No  
– That is the initial designation for Listeria (before the specific identification is made)

Which bacterium causes the disease diphtheria?  
Corynebacterium

What are the hallmarks of diphtheria?  
– Hoarse with sore throat  
– Low-grade temp  
– Gray-white pharyngeal membrane

What is the most worrisome complication in diphtheria infection, other than the respiratory compromise issues?  
(popular test item!)  
Myocarditis

How is diphtheria treated?  
Antibiotics (PCN or erythro)  
+  
Antitoxin

On the boards, a patient who presents with diphtheria will typically be in what demographic group?  
An immigrant (sometimes from Eastern Europe) (idea being that immigrants may not have been immunized)

What are the two main complications of diphtheria, other than airway issues?  
1. myocarditis  
2. polyneuritis

What are the two infectious diseases for which treatment with antitoxin is crucial?  
Diphtheria + tetanus (patient will not get better without it!)

What kind of infection does arcanobacterium cause?  
Pharyngitis (like GAS) + scarlet fever rash
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|----------------------------------------------------------------------|
| Are there any important complications related to arcanobacterium infections? | No                                                                   |
| What treats arcanobacterium infections?                                 | Almost anything! – PCN, erythro, tetracycline, etc.                    |
| A black eschar on the skin of a farm kid = what diagnosis?              | (cutaneous) anthrax                                                   |
| Are the skin lesions of anthrax infection painful?                     | No                                                                   |
| What three forms can anthrax infection take?                            | Cutaneous (95 %)                                                      |
|                                                                      | Pulmonic (near 5 % – aka inhalational)                                |
|                                                                      | GI                                                                    |
| Is anthrax infection only seen in bioterrorism incidents?              | No!                                                                  |
|                                                                      | It occurs in nature, especially with livestock contact (usually cutaneous), consumption of infected animals (GI), and inhalation due to work with contaminated wool. Skins, or bone meal (inhalational) |
| Do you need to notify anyone if you see a case of suspected anthrax (in the US)? | Yes, it is a reportable disease – Notify local health authorities & the CDC (If bioterrorism is a concern, notify FBI via local police) |
| What is the big difference in treatment regimens between naturally acquired anthrax, and anthrax contracted through bioterrorism? | Penicillin/amoxicillin is the drug of choice(!) for naturally occurring anthrax Treatment must still be rapid, but fancy medication regimens are not needed |
| If you are treating an anthrax patient with systemic involvement with penicillin, what type of dosing must you use? | Meningitis level – Meningitis is often a component of systemic anthrax, so PCN penetration of the blood–brain barrier is important! |
| Question                                                                 | Answer |
|------------------------------------------------------------------------|--------|
| Is it safe to begin anthrax treatment with penicillin or amoxicillin, if bioterror is not suspected? | No – Current pediatric guidelines recommend beginning with ciprofloxacin (change to PCN or amoxicillin if susceptible when test results are available) |
| Is anthrax pneumonia communicable from ordinary person-to-person contact? | No (plague pneumonia is though, big time) |
| A young military recruit presents with what seems like pneumonia. On CXR, you see a widened mediastinum. Diagnosis? | Pneumonia + wide mediastinum = *anthrax pneumonia* |
| If a patient has just been exposed to anthrax, how can you decontaminate him or her, so that others aren’t infected? | Spores remaining on the patient or patient’s clothes can infect others. Remove clothing & decontaminate patient with soap & water |
| For children & adults, what is the drug of choice for uncomplicated cases of cutaneous or GI anthrax, *if the source of anthrax exposure might be aerosol (such as in a bioterror attack)*? | Ciprofloxacin or doxycycline (60 days, as usual) |
| Why is the treatment length so long, when inhalational anthrax is possible? | Because spores stuck in the lung sometimes don’t start growing for a long time after they are inhaled – The 60 days is to try to be sure antibiotic is present if they do! |
| Why is anthrax vaccination recommended for patients with pulmonary anthrax or inhaled exposure to anthrax? | The same reason – Just in case a spore sits in the lung a long time before starting to develop, the body’s immune system would be ready |
| What is the issue, currently, with immunizing children following an aerosol anthrax exposure? | The vaccine is not yet (as of 2014) FDA approved for children – informed consent required to administer it |
How do you treat uncomplicated cutaneous anthrax in kids if you have no suspicions of bioterror? Ciprofloxacin or doxycycline – 7–10-day treatment course (may use PCN or amoxicillin if susceptibility is good – but resistance can develop during monotherapy treatment)

For a very systemic anthrax infection, such as pulmonary anthrax, what medication should you use initially? Ciprofloxacin & clindamycin (Idea is to combine a cidal antibiotic with a protein inhibitor antibiotic – if sensitive, can change to PCN, doxycycline, etc., later)

What medications are recommended, in addition to the core fluoroquinolone medication, for treatment of systemic anthrax infections? Clindamycin & doxycycline Rifampin & Linezolid

What is the difference between the duration of treatment for the systemic infection, and the duration of post-exposure prophylaxis? Prophylaxis is always 60 days! Treatment is shorter, until resolution of infection (10 days for cutaneous, usually 14 days for systemic)

Anthrax can sometimes cause meningitis. If anthrax meningitis is suspected, what commonly used anthrax antibiotic should you AVOID? Doxycycline – It doesn’t cross the blood–brain barrier well

What treatment is recommended for systemic anthrax WITH meningitis? Ciprofloxacin + Meropenem + Linezolid Minimum 2–3-weeks duration! (Idea is to combine one quinolone with one beta lactam or glycopeptide & one protein synthesis inhibitor)

Which antibiotic is preferred for a pregnant or breast feeding mother, who may have been exposed to anthrax? Amoxicillin or Clindamycin – Consider others depending on susceptibilities & risk vs. benefit
Children living on a military base present with painless skin lesions, and two have a cough/tachypnea. What is it?  

Anthrax exposure due to bioterrorism  

If inhalational anthrax exposure is suspected in a pediatric patient, what treatment regimen should be given, and for how long?  

Ciprofloxacin – 60 days (even for preemies . . .)  

What special treatment can be obtained from the CDC, if inhalational anthrax is suspected, in addition to the usual antibiotics?  

Raxibacumab – a monoclonal antibody (can also be used as prophylaxis, if other therapies cannot be)  

Is cutaneous anthrax communicable due to person-to-person contact?  

No (rare cases of transmission from body fluid contact at lesion sites may occur)  

What CXR finding do you look for to identify pulmonary anthrax?  

Wide mediastinum  

What is the unusual shape of the anthrax organism, if micro information is provided?  

They look like “boxcars” from a train, all lined up!  

A patient presents with nausea & vomiting after eating Chinese food that was left out for a while. What is the organism and treatment?  

– Bacillus cereus  
– No treatment  

If you’re eating rice infested with B. cereus, how do you know whether you’ll get vomiting vs. diarrhea?  

– if the bacteria hasn’t had time to make toxin yet, you get diarrhea because it makes the toxin in your gut (8–16-h incubation time)  
– if toxin was already made and in the food, you start vomiting within a few hours  

Will cooking the food better protect you from the emetic form of B. cereus toxicity?  

No – the toxin is heat stable  

Normally, we think of B. cereus with fried rice “food poisoning.” What two unusual infections is it also able to produce?  

1. IV catheter infection  
2. Eye infection after penetrating globe injury
**How are serious *B. cereus* infections treated?**

Profuse diarrhea in a hospitalized patient who has recently been treated with an antibiotic = what diagnosis?

Can vancomycin be given orally?

How does *Clostridium perfringens* cause problems for the gut?

If you suspect that a patient has *C. difficile* colitis, how do you diagnose it by labs?

What is the first line treatment for *C. difficile* colitis?

If a boards question discusses a patient with palpable purpura, and a state (such as North Carolina) is mentioned, what is the diagnosis?

If a patient is presented who is ill, has petechiae + hypotension, and no state is mentioned, what is the diagnosis?

Which patients do not need any treatment after possible tetanus exposure?

If a patient sustains a “clean” wound, and had a tetanus immunization 6–10 years ago, is any treatment required?

When should tetanus IG be given? (2 situations)

If a pregnant woman is exposed to *N. meningitidis*, should she have Rifampin prophylaxis?

**Vancomycin**

*C. difficile*

24-h diarrhea – rapid onset

*C. diff* toxin (not culture) –

FYI: *False negatives are common*

Metronidazole *PO*

RMSF (Rocky Mountain spotted fever)

*Neisseria meningitidis*/bacteremia

<5 years since last tetanus

No – within 10 years is alright for clean wounds

Dirty wound +

1. <3 tetanus immunizations completed
2. Immunization history unknown

No –

Rifampin is contraindicated in pregnancy (use ceftriaxone)
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| If Gram-negative diplococci are seen in the vaginal discharge of a female patient, can it be normal flora? | Yes – Females sometimes have other Neisseria species as normal flora – doesn’t have to be *N. gonorrhoeae* |
| How should you conclusively diagnose *N. gonorrhoeae* in a female patient? | Culture (but treat anyway if suspicion is high)                         |
| Are Gram-negative diplococci ever seen as normal flora in male patients? | No – it’s gonorrhea                                                     |
| Special susceptibility to *N. meningitidis* infection is associated with what immune system problem? | Complement deficiency (and asplenia)                                    |
| Moraxella catarrhalis frequently causes what two infections?            | 1. Otitis media  
2. Sinusitis                                                                 |
| What is special about *M. catarrhalis*?                                 | B-lactamase producer (susceptible to most other antibiotics)            |
| Pseudomonas is famous for causing what infection in diabetics?          | Chronic otitis externa                                                 |
| A neutropenic patient presents with little round raised lesions, dark, with a central ulcer. What is the lesion called, and what caused it? | – Ecthyma gangrenosum  
– Pseudomonas                                                                     |
| If a patient sustains a puncture wound to the foot, through a rubber-soled shoe, what is the organism to watch for? | Pseudomonas                                                             |
| If a diffuse red rash develops around hair follicles, and the patient has a history of hot tub use, what is it and how do you treat it? | – Hot tub folliculitis (pseudomonas)  
– No treatment needed                                                      |
| If a patient presents who is infected with a “Burkholderia” species, what underlying disorder should you suspect the patient has? | CF (cystic fibrosis)                                                   |
There are two types of Burkholderia. How were they previously designated? (In other words, why haven’t you ever heard of them before?)

They were pseudomonas species – recent change

In general, what is the significance of a Burkholderia infection?

Bad prognostic + difficult to treat

Patients with turtles or other reptiles at home, who develop diarrhea, have what diagnosis?

Salmonella (usually non-typhi)

Iguana + diarrhea =

Salmonella infection

In addition to reptiles, where else does Salmonella exposure occur?

Eggs/chickens and milk

Homemade Thanksgiving stuffing & a family diarrhea outbreak = what organism?

Salmonella (grandma put raw eggs in the stuffing!)

Typhoid fever has what two recognizable signs that S. typhi is the cause of the diarrhea?

– “Rose spots” on trunk 1 week after fever starts (light red macules)
– Low WBCs

Who was “Typhoid Mary” and why is she important to your peds boards?

– A food handler who spread a lot of typhoid
– She reminds us that Salmonella species sometimes cause an asymptomatic carrier state

If your patient will be traveling to someplace with a lot of typhoid, what should you recommend?

Oral typhoid vaccine (must be older than 2 years to take it)

If a child presents with high fever, seizure and diarrhea, and has a bandemia on labs, what is the diagnosis?

Shigella
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| A child in or from the developing world presents with rectal prolapse during a febrile diarrheal illness. What is the infection? | **Shigella** *(diarrhea + rectal prolapse in the US is usually trichuria aka “whipworm”)* |
| Most childhood diarrheal illnesses can be treated with TMP/SMX, if antibiotic treatment is indicated. Will this work for Shigella? | No – it is usually resistant – Use a 3rd-generation cephalosporin or azithromycin |
| Is Pepto-Bismol® a good way to treat or prevent traveller’s diarrhea in kids? *(bismuth subsalicylate)* | No – it contains lots of salicylate *(aspirin-type toxicity!)* |
| When dealing with *E. coli* diarrhea, why is it important to know whether the causative organism is ETEC *(traveller’s diarrhea)* or EHEC *(hemorrhagic diarrhea)*? | Antibiotic treatment improves ETEC, but *increases* probability of HUS in EHEC! |
| What clue from the microbiology lab tells you that you are dealing with EHEC? *(a clue you would never normally know!)* | It only grows with “*sorbitol-enhanced agar*” Mnemonic: Imagine bloody sugar cubes sitting on an agar plate |
| What is the triad of HUS, and which diarrheal illness is it associated with? | 1. Renal failure  
2. Hemolytic anemia  
3. Thrombocytopenia  
*E. coli* 0157:H7 |
| What is the other acronym for EHEC? | STEC (Shiga-toxin-producing *E. coli*) |
| Epidemic *E. coli* outbreaks are famous for occurring in what two settings? | 1. Undercooked beef  
2. Waterpark outbreak |
| Less well-known sources for EHEC infection are what two foods? | 1. Unpasteurized milk  
2. Apple juice |
| If a vignette mentions that a child has not had their immunizations, or the parents refused childhood immunizations, what infection should you *(mainly)* worry about? | **H. flu** |
You have done a bacteremia work-up, and the blood culture comes back positive for *H. flu*. You call the family & the child is doing fine – what should you do?

**Treat it!**

*H. flu* bacteremia is always treated

(Strep pneumo bacteremia is not treated if the kid is fine)

---

What is the buzzword for *H. flu* on micro?

“Pleomorphic” Gram-negative coccobacillus

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With *H. flu* meningitis, should you give steroids automatically?

Yes – it reduces hearing loss & other neuro sequelae

---

How do you treat *H. flu* bacteremia?

Admit for IV ceftriaxone

---

**A child with a red & prominently swollen cheek presents to you. You can feel the margins of the rash when you palpate the inner surface of the cheek. What is this?**

**Buccal cellulitis**

(often *H. flu*, often a picture on the boards, vanishingly rare now with *H. flu* immunization)

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*H. flu* has historically been known for causing what throat disorder?

Epiglottitis – with a “cherry red” epiglottis

---

Do contacts of a patient with a significant (meaning not OM) *H. flu* infection require chemoprophylaxis?

Yes, if <4 years old & not fully immunized OR immunocompromised

(Rifampin × 4 days for household contacts)

---

Why might a patient with *H. flu* also require “chemoprophylaxis”?

Therapeutic antibiotics do not always eradicate carriage of *H. flu*, so if susceptible household members are present they would still be at risk from the patient

---

**How is plague transmitted?**

Bite of infected fleas

---

A young person presents with a hemorrhagic pneumonia “spewing blood” on the boards exam. What is the likely boards diagnosis?

Pulmonic plague (bioterrorism in most cases)

---

Is pulmonic plague contagious from person-to-person regular contact?

Highly!

(due to coughing)
Is it a good idea to aspirate the swollen lymph node, if plague is suspected? What about in a cat scratch disease?

Plague – yes (for diagnosis)
Cat Scratch – no (can lead to fistulas)
Mnemonic: it is never a good idea to stick a needle in a cat!

Is bubonic plague a big problem, in terms of mortality/morbidity?

No – It’s the pneumonic form that’s so deadly

A patient presents with RLQ pain & rebound, and appears to have appendicitis. The lab notifies you that an organism has been identified from one of the bodily fluids. What is the organism?

_Yersinia enterocolitica_ (Popular test item!)

There are two related organisms that cause a “pseudoappendicitis” presentation. What are they?

_Yersinia enterocolitica_ & _Yersinia pseudotuberculosis_ (Popular test item!)

Patients with too much iron (due to transfusions, hemochromatosis, etc.) are likely to become bacteremic with what organism?

_Yersinia enterocolitica_ (it has a special interest in iron) (Popular test item!)

Chitlins (the food) + diarrhea = _Yersinia enterocolitica_ infection

Iron overload patient + bacteremia = Probable _Y. enterocolitica_ infection

Sickle cell patients are generally anemic, but can a sickle cell patient also be iron overloaded?

Yes – Due to hemolysis + transfusions

Legionella can be treated with _erythromycin_, but it requires a high-dose regimen. If a child treated with _e-mycin_ develops hearing loss, is it the _e-mycin_ or the Legionella that did it?

_The erythromycin_ (at high doses) (Popular test item!)

(IV azithromycin is the drug of choice, though, for pediatric Legionella)
Atypical pneumonia + diarrhea, often accompanied by hyponatremia, is what disorder?

**Legionella pneumonia**

Klebsiella mainly causes pneumonia + UTIs. What is important to know about it?

**Always β-lactam resistant** (Moraxella, also)

What medication(s) treat(s) tularemia?

Streptomycin

Or

Doxycycline

If a boards question has streptomycin as an answer option, you should go back to see whether the question is actually dealing with which two disorders?

Resistant TB

Or

Tularemia

How do patients usually contract tularemia?

Tick bites

(Other types of animal contact can also produce infection, at times, including rabbit skinning)

How do you diagnose tularemia?

By serology – do not aspirate nodes

What weird complication of cat scratch disease sometimes occurs, but spontaneously resolves?

Encephalitis/seizures

If you’re not supposed to aspirate cat scratch nodes (don’t stick needles into cats, remember), how do you make the diagnosis?

Either clinically or serology

Should cat scratch fever be treated?

Optional – azithromycin may “speed resolution”

Citrobacter is associated with what type of infection?

**Brain abscess**

(Popular test item!)

If a neonate with a fever has Citrobacter in the blood culture, what test(s) should you order next?

LP (if not already done)

+ Head CT
Low sodium + history of tick bite = RMSF

A child who is less than 8 years old develops RMSF. How should you treat him/her on the boards?

The evolution of the RMSF rash is?

1. Maculopapular to petechial
2. Centripetal – begins distally & works inward

Mnemonic:
Remember, you injure your palms & soles climbing rocky mountains

What is the usual treatment for RMSF?
Doxycycline

How do patients contract RMSF?
Tick bite

Where can patients contract RMSF?
Not in the Rocky Mountains – New England to Texas (skipping Florida & Louisiana)

What is Rocky Mountain spotless fever?
Ehrlichiosis
(same fever & arthralgias-usually no rash)

There are two forms of Ehrlichiosis-what’s the difference?
One lives in monocytes, the other lives in neutrophils

Which form of Ehrlichiosis affects granulocytes, and is typically a dog Ehrlichiosis pathogen – now identified also in humans?
Ehrlichia ewingii

A flu-like illness with pancytopenia and a “morula” on the smear =
Ehrlichiosis
(tick-borne)
(morula refers to a “berry-like” cluster of intracellular organisms)

Where is Ehrlichiosis found? (geographically)
Same distribution as Lyme disease + West coast & near Great Lakes

(Popular test item!)
An adenitis that does not respond to the usual antibiotics is probably due to what sort of organism?

*Popular test item!*

How is mycobacterial adenitis treated?

*Popular test item!*

A child develops skin ulcerations in a line on his arm after straining to reach into an aquarium to feed his fish. What is this?

*Popular test item!*

Lymphatic infection + fish tank or fresh water pool =

*Popular test item!*

How are children usually exposed to tuberculosis?

By adults

How does tuberculosis usually manifest itself in children?

Usually it doesn’t! (asymptomatic)

Does TB usually cause pulmonary infection during the primary infection?

No – But if it does, the problem is usually in the lower lobe (not upper lobe)

What usually happens after the primary TB infection resolves?

It goes into a latent phase – May reactivate later in the upper lobe

Obvious pulmonary infection with primary TB occurs most often in which patients?

Adolescents & HIV infected

When dealing with fluid related to tuberculosis (pleural or pericardial effusion), how useful is a sample of the fluid for making the TB diagnosis?

Not very – Biopsy of nearby tissue is better

On neuroimaging, what findings suggest TB meningitis?

Enhancement of basal ganglia/posterior areas (+ pus at the base of the brain)

*M. marinum* (tracks along lymphatics)

*M. marinum* infection
Clinically, what findings suggest TB meningitis, as opposed to other types of meningitis?

- Slow, chronic course
- Cranial nerve findings (due to pus accumulating at base of brain)

What electrolyte/endocrine problem often occurs with TB meningitis?

- SIADH (hyponatremia)

Is meningitis a common development for people infected with TB?

- No – Only common on the boards

When adolescents present with TB, it is often reactivation disease. How do they present?

1. Generalized symptoms: fever, wt loss, night sweats
2. Pulmonary: cough, hemoptysis, pleuritic chest pain
3. Radiological: upper lobe infiltrate with hilar LAD

*In other words, they have the classic TB presentation!*

What is the problem with placing a PPD on a 4-month-old infant?

- Not reliable for infants <6 months old

*Popular test item!*

After exposure to TB, how long does it take for the PPD to turn positive, if the patient has contracted the disease?

- About 3 months

*Popular test item!*

When is it alright to place a PPD, in relation to a possible TB exposure?

- Anytime – but you will need to repeat it after 3 months have elapsed to be sure

*You still want to test early, because if it is positive, you will start treatment*

*Popular test item!*

What determines whether the PPD is positive or not?

- Amount of induration

*Color of the skin is irrelevant!*

How large does the PPD site need to be for you to consider it positive? (generally speaking)

- 15 mm
Patients in what age group have a lesser requirement for judging their PPD to be positive?

Kids <4 years old are considered positive at 10 mms

Usually, 15 mm of induration is needed to consider a PPD test positive. For which patient groups is 10 mm sufficient?

Kids <4 years old

&

Anyone you’d be concerned about (health care workers, institutionalized people, homeless, diabetic, immigrants, etc.)

If a patient is PPD positive, what should you do about it?

Get a CXR and sputum to check for active disease

If your patient is PPD positive, but you don’t find any active disease, how should you treat him or her?

6–9 months of INH

If you evaluate a PPD-positive patient, and find active disease, how should you treat him or her?

4 drug therapy until sensitivities come back (multidrug-resistant TB is a very ugly problem)

What four drugs are in the “four-drug TB regimen?”

INH

Rifampin

Pyrazinamide

Ethambutol or streptomycin

Mnemonic:
The drugs can be rearranged to spell SPIRE-like the sharp tip of a tower skewering a TB “red snapper”

Why are TB bugs called “red snappers?”

They are acid-fast on stain, so they look bright red

For which patients could 5 mms of induration on the PPD be considered positive? (2 groups)

– seriously immuno-compromised

(HIV or other T-cell disorders, organ transplant patient, chronic high-dose steroids)

– or seriously worried

(bad lung disease/fibrosis, close contact with case)
What is the name of the stuff used for the PPD?

*Mantoux 5 Todd units* (Popular test item!)

There is a certain patient group for whom you should *not* prescribe ethambutol. What group is it?

*Children too young to be tested for color vision*

Why is color vision testing important for patients taking ethambutol?

*Its main side effect is decreasing visual acuity, and loss of color vision is the first sign that this side effect is developing*

What is the main side effect of the three core anti-TB drugs? (INH, rifampin, & pyrazinamide)

*Hepatotoxicity (all three of them do it)*

Should routine testing for hepatotoxicity be conducted when giving INH, rifampin, and/or pyrazinamide? (Popular test item!)

*No – Testing is *only indicated* if symptoms of liver trouble develop*

Sulfur-colored granules coming from a facial abscess = what diagnosis?

*Actinomyces infection*

Known question of interest

What unusual pathogen is sometimes involved in PID if an IUD is in place?

*Actinomyces (yuck!)*

What kills actinomyces?

*Gram+ antibiotics (including PCN)*

What have Chlamydia species been redesignated?

*Chlamyphila (!)*

Where do *Chlamydia psittaci* infections come from?

*Birds – especially in the house*

What is the hallmark of *Chlamydia psittaci* pneumonia?

*Pneumonia with splenomegaly* (Known question of interest)

Are *Chlamydia psittaci* pneumonia patients ill appearing?

*Yes, definitely (Rigors, high temp, myalgias – not like “walking pneumonia”)*
Does Chlamydia pneumoniae infection come from birds?
No – It’s spread person-to-person

Are Chlamydia pneumoniae patients usually very ill?
No – wheezing is common, but not very ill

What kind of Chlamydia sometimes causes pneumonia in young infants?
Trachomatis

Which type of Chlamydia causes eye infection in newborns?
Trachomatis

What is the classic presentation of chlamydia pneumonia in infants?
Afebrile infant with a “staccato cough”

A child presents with fever, headache, increased LFTs. The history involves exposure to pet mammals and water that the animals have been in or near. What is the diagnosis?
Leptospirosis

What is the connection between the animals, water, and leptospirosis infection?
Leptospirosis from the animal’s urine gets into the water

How do you make the diagnosis of leptospirosis (conclusively)?
Blood culture (serological tests to assist with rapid diagnosis are sometimes available, but begin treatment on clinical suspicion if they are not!)

If the organism is in the urine, why can’t I just culture the urine?
It is in the urine, but not until very late in the course
(Known question of interest)

If a leukemia patient develops line sepsis, and cultures show Candida, what should you do?
Pull the line &
Start amphotericin B
(Known question of interest)

For any significantly sick patient with a fungal infection, what should you do?
Start Ampho B (IV)
(Known question of interest)

What skin disorder does Malassezia furfur cause?
Tinea versicolor (lesions fluoresce with Woods lamp)
What does M. furfur look like on a KOH prep?

Spaghetti ‘n’ meatballs!

Why is it hard to get rid of Tinea versicolor?

It is normal human flora

What are the important predisposing factors for development of Tinea versicolor?

Sweating & high cortisol levels

(That’s why it so often develops in adolescents – they tend to be sweaty with high cortisol levels)

What systemic treatment is helpful if your patient is really motivated to treat a widespread tinea infection?

Ketoconazole –

It’s excreted in the sweat

(the other “azole” medications are also effective)

If a vignette indicates that the patient is a very low birth weight infant on lipid hyperalimentation, and the patient is infected with something, what is it?

Malassezia furfur

(it has a thing for lipids – just like Yersinia enterocolitica has a thing for iron!)

(Known question of interest)

What is the giveaway that your patient has a Malassezia furfur infection, in terms of the micro info?

Olive oil overlay is needed to grow out the blood culture

(in addition to Sabouraud’s medium)

If your patient has an invasive M. furfur infection, what is the correct treatment?

• Pull the lines
• D/C lipid infusion
• Ampho B (1 mg/kg/day)

Pneumonia + splenomegaly = what diagnosis?

Chlamydia psittaci pneumonia

If an adolescent patient isn’t responding to over-the-counter treatment for athlete’s foot (Tinea pedis), then what is the likely problem?

Candida

(the “azole” topicals, like miconazole, will kill both)

Which patient group is most likely to develop Tinea pedis (athlete’s foot)?

Adolescent males
An adolescent patient with AIDS presents with meningitis on your board exam. What unusual pathogen is likely?

**Cryptococcus**

How is *cryptococcus* diagnosed? (two methods)

Cyroptococcal antigen or “India ink” preparation (has a big halo around it)

Does cryptococcal meningitis usually present with a chronic or rapid onset?

Chronic

A child has been helping his grandmother in the garden. He develops an ulcerated lesion on one fingertip. What is the problem?

**(Known question of interest)**

**Sporothrix**

What are the treatment options for Sporothrix?

Itraconazole

Or

A saturated solution of potassium iodide (both are taken PO!)

A diabetic adolescent presents with black eschar in, or on, the nose. What is it, and how is it treated?

Known question of interest

• Invasive mucormycosis. It is bad.
• Treat with extensive debridement + Ampho B

Where does invasive mucormycosis begin?

Nasal turbinates or hard palate (remember: black eschar)

Which patients are at risk for invasive mucormycosis?

Immunocompromised (including diabetics – the fungus is everywhere in soil, bread, etc.)

Is eosinophilia a hallmark of protozoal disease?

**No** – that’s parasites

If a patient is infected, and the question involves a kitty litter box, what is the infection?

**(Popular test item!)

Diarrhea following berry eating = infection by what organism?**

**(Popular test item!)

Cyclospora**
How is cyclospora infection treated?

TMP/SMX
(Bactrim®)

Which two diarrhea causing organisms are “acid-fast?”

Cyclospora & Cryptosporidium

What is unusual about cryptosporidium infections?

Tends to be epidemic & Watery diarrhea lasts 1–2 weeks!

In the immunocompromised, what is different about cryptosporidial infection?

The infection becomes chronic & requires treatment (nitazoxanide is the first line)

In infectious disease, “maltese crosses” go with what disorder?

Babesiosis (they clump together & form the shape of a Maltese Cross)

Which patients with a specific sort of immunocompromise are in especially bad trouble if they contract malaria?

Asplenic patients!

If you have a malaria blood smear with multiple RBCs infected in one field or multiple parasites are in each RBC, what type of malaria are you dealing with?

P. falciparum (the really dangerous one)

Mnemonic: Think of it as “Fancy-parum” – it’s the one that creates the really “fancy” complications

Which type of malaria has only been identified in the last few years, and produces severe infections very similar to falciparum?

P. knowlesi (found in Southeast Asia)

On the peds boards, if they show a malaria blood smear & you’re not sure what it shows, what should you guess?

P. falciparum (it’s the main one they want you to know about)

(Popular test item!)
Is chloroquine usually good malaria treatment/prophylaxis?  
**No** – Most malaria is resistant  
(Popular test item!)

If your patient is traveling to Africa or Asia, what should you assume when deciding on their malaria prophylaxis regimen?  
Assume the malaria is chloroquine resistant

If your patient is traveling to an area where the malaria is definitely chloroquine sensitive, what prophylaxis regimen should you prescribe?  
Chloroquine!  
(We don’t want to encourage resistance in the few areas where it’s still effective.)

If a malaria patient is too ill to take meds PO, what should you do?  
Give IV artesunate (an artemisinin drug available from the CDC)  
(IV quinidine is also an option, but studies indicate the newer artesunate reduces both mortality & complications)

Should the dangerous falciparum or knowlesi malaria be treated with IV monotherapy?  
A second agent (generally oral) should be added to improve efficacy & reduce relapses

Cerebral malaria is when the malaria affects the brain, causing seizures. Are steroids helpful for cerebral malaria?  
No  
(don’t give – could make things worse)

What is the most important thing to remember about malaria prophylaxis?  
Take it **before**, **during**, and **after** the trip

Which two types of malaria sometimes take up prolonged residence in the liver?  
Vivax + ovale  
Mnemonic: Vodka goes to the liver – v & o are the first 2 letters of vodka, reminding you that these two stay in the liver.

Should chloroquine ever be used to treat *P. falciparum*?  
**No**  
(Popular test item!)
Which medication gets rid of the hypnozoites, the malaria forms that live long-term in the liver?

**Primaquine**

Why don’t the other meds kill the forms living in the liver?

The other meds only kill free organisms – if it’s hidden inside a cell (including RBCs) they can’t get to it

If a question asks about a particular site that some malaria use to attach to the RBC, what is the name of the site?

**The “Duffy antigen” site**

(Vivax malaria)

Which of the four types of malaria is most associated with nephritic syndrome?

**P. malariae**

(all types are associated with nephritis, in general)

Where should you look for a “Maltese Cross” in a Babesia infection?

Inside the RBC

A patient who has visited the Northeastern USA presents with cyclic fevers, hemoglobinuria, anemia, and emotional lability. What’s the problem?

Babesiosis

Where does Babesiosis come from?

Ticks – Often co-infected with Lyme or Ehrlichiosis

If a patient presents with anemia, pancytopenia, cyclic fever, & rigors, on the boards, what’s wrong with him or her?

**Babesiosis with Ehrlichiosis coinfection** (hence the pancytopenia)

(Popular test item!)

How is babesiosis treated?

Clindamycin + quinine (usually)

In mild cases of babesiosis, or in treatment failures, what other antibiotic treatment regimen is recommended?

Atovaquone & azithromycin

(has fewer side effects than the Clinda + quinine regimen, also)
A child living in Texas, near the border of Mexico, presents with a liver abscess. What is it likely to be, and how do you diagnose it?

(Popular test item!)

**How is *Entamoeba histolytica* infection treated?**

- **Metronidazole**
  - (or tinidazole)
  + Paromomycin or diloxanide
  - (used to clear the organisms in the gut, which are *not* killed by the systemic treatment)

In the USA, which patients are at risk of developing amebiasis?

- US residents living near the border of Mexico
- Immigrants
- Gay men
- Institutionalized patients

Who gets Giardia in the USA (usually)?

1. Campers
2. Returning travelers
3. Daycare kids
4. Immunoglobulin (Ig) disorders

What are the giveaways for Giardia infection, in terms of symptoms?

(Famous question of interest)

- Flatulence & distension
  - & watery, smelly, uncontrollable diarrhea

In some cases, Giardia can become a chronic infection. If this happens, what are the main symptoms?

(Popular test item!)

1. Flatulence
2. Soft stools
3. “Sulfuric” belching (eructation)

Where does Giardia live (in the human body)?

- In the duodenum

How is it transmitted?

(Famous question of interest)

- Fecal-oral
  - (especially from beavers & muskrats!)
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| How is *Entamoeba histolytica* transmitted?                            | Fecal-oral                                                             |
| How is Giardia treated, or will it spontaneously resolve?              | It’s usually severe enough (& contagious enough) that it should be treated –  
|                                                                        | Use metronidazole or tinidazole                                         |
| How is the diagnosis of Giardia made, based on labs? (3 ways)          | 1. Giardia specific antigen                                            |
|                                                                        | (in stool)                                                             |
|                                                                        | 2. Fresh stool O & P                                                   |
|                                                                        | 3. String test                                                         |
| Although the string test only occurs on the boards, you should know how it is done. What is the procedure? | A string is swallowed – long enough to end up in the duodenum – while the remainder stays exterior. Giardia adhere to the string, which is microscopically inspected after it is taken out. |
| Technically, is metronidazole FDA approved for Giardia treatment in kids? | No (but still an okay answer on the boards if no good alternatives given) |
| An immigrant child presents with heart block + cardiomyopathy. What ID cause should you consider? | Chagas disease (American trypanosomiasis)                              |
| What are the three main differences between protozoa and helminths (aka “worms”)? | Protozoa: Single celled, replicate in human, no eosinophilia            |
|                                                                        | Worms: Multicellular, replicate elsewhere, + eosinophilia              |
| This syndrome of shifting pulmonary infiltrates and eosinophilia can be caused by roundworms. What is the name of the syndrome? | Loffler’s syndrome (eosinophilic pneumonia)                            |
| A photo of a child living in the southern USA is shown. The foot has a serpiginous line on it. What is the diagnosis? | Hookworm (Necator)                                                     |
| Question                                                                 | Answer                                                                 |
|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| About 1 in 20 people in the USA is infected with which type of roundworm? | Trichinella (from pork, normally doesn’t cause a problem)               |
| The famous “scotch tape test” is used to diagnose what helminthic disorder? | Pinworm (Enterobius vermicularis)                                       |
| Pinworms are treated with what medications?                           | Albendazole/mebendazole                                                |
|                                                                        | Mnemonic: You need to “bend” to show your itchy butt!                  |
| A child from the southern USA with diarrhea, abdominal pain, and rectal prolapse may have what helminth infection? | Whipworm (Trichuria)                                                   |
| Helminths (worms) are not supposed to replicate in the human body. What is the only exception to this rule? | Strongyloides                                                          |
| Does Strongyloides typically cause a noticeable infection?            | No – except if the patient becomes immunocompromised – then they are everywhere! |
| If Strongyloides causes noticeable infection, what does it cause?     | Gut – diarrhea                                                          |
|                                                                        | Lungs – cough, pneumonia, & hemorrhagic pneumonia                       |
| How is Strongyloides treated?                                         | Ivermectin is the treatment of choice                                  |
|                                                                        | (thiabendazole was used in the past & was effective, but is no longer made) |
| Biliary obstruction in someone who has recently visited the Far East & eaten raw fish is probably due to _____? | Clonorchis sinensis (biliary fluke)                                    |
| Hematuria results from infection with what fluke?                     | Schistosoma haematobium                                                |
|                                                                        | Mnemonic: Haematobium causes urinary “heme”                             |
| Which medication is usually good for killing flukes?                 | Praziquantel (decreases “quantity” of flukes!)                         |
Genital herpes is supposed to be due to which herpes simplex virus – 1 or 2?

2 (usually)

Facial herpes infections, then, are usually due to which HSV virus?

HSV 1 (one is on the top, two is on the bottom!)

Asymptomatic shedding of virus is important because ________?

It allows HSV to spread when no lesions are present (this is the boards answer – expert opinions vary)

Systemic symptoms are expected with what type of HSV infection?

Primary – either type 1 or 2 first time infection

How is acyclovir helpful in a primary herpes infection?

It shortens the course

A housekeeper from outside the US starts working in a household here. Soon after, one of the children is brought to the ER with a seizure. Why?

Cysticercosis in the brain (eggs in undercooked pork go to brain & retina)

How will you know that a patient has cysticercosis?

The lesions show up on head CT

At what point in the worm’s life cycle do cysticercosis organisms cause a problem?

When they die – They cause inflammation & seizures

What is the main treatment for neurocysticercosis?

Albendazole + steroids (to reduce inflammation)

A Hispanic child is presented on your boards. He is seizing, and the head CT shows enhancing cystic structures. What is his diagnosis?

Neurocysticercosis

If an immunocompromised patient develops primary or recurrent HSV, how should you treat him or her?

IV acyclovir (same for any significantly sick patients suspected to have herpes infections)
If a pregnant mom has active genital HSV lesions at the time of delivery, what management is recommended?

C-section (protection from neonatal infection is not complete, but it is helpful)

Serious neonatal HSV infections most often occur in what setting?

Mom acquired an asymptomatic primary HSV 2 infection near time of delivery

If a patient is being admitted to the hospital with a known Varicella zoster infection exposure (and the patient is not immune), should the patient be isolated, & if so, for how long?

Yes – days 8–21 after infection exposure (whether or not the patient has signs of the disease)

(some sources say 10–21)

What type(s) of isolation are needed for Varicella zoster virus (VZV)?

Contact & airborne (spread in primary infection is mainly via the respiratory system & very efficient)

Which patients are most at risk for severe varicella zoster infection & bad complications?

(3 groups)

• Immunocompromised (of course)
• Adolescents/adults
• Pregnant women & preemies/neonates

For patients at risk of severe Varicella zoster problems, what is the best management if they don’t seem to be very ill?

Give oral or IV acyclovir, even if not very ill

(just prophylactic)

Valacyclovir is also used

If a pregnant adolescent is presented on the boards with varicella zoster infection, what should you do?

Give acyclovir

(popular test item!)

What are the two most common CNS complications of varicella zoster?

(very common on the boards, especially!)

Encephalitis & Transient cerebella ataxia

What is by far the most common complication of chicken pox?

Staph or strep secondary skin infection

(popular test item!)
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| What skin-related complication occurs regularly with chicken pox on the boards? | Toxic shock syndrome & Necrotizing fasciitis (popular test item!) |
| If a patient has been given VZIG prophylactically, & is in the hospital, how long will you need to keep the patient in isolation? | 28 days! (days 8–21 only if the patient was exposed but not given VZIG) |
| Is it alright to immunize a pregnant woman with the varicella vaccine? | No (popular test item!) |
| Which chicken pox complication are pregnant patients especially likely to develop? | Varicella pneumonia (very bad!) |
| Can a pregnant patient be given varicella zoster immunoglobulin? | Yes – and should be if she is exposed & seronegative Acyclovir prophylaxis (7 days) may also be given |
| How long can you give varicella zoster IG after exposure? | 4 days |
| Which neonates are at risk for severe varicella zoster infection? | Those whose moms developed chicken pox in a 7-day window – 5 days before delivery to 2 days after (Mom didn’t have a chance to make IgG antibodies & transmit them) |
| If a mom developed chicken pox 6 days before delivery, should you treat the infant as high risk for VZ? | No (popular test item!) |
| What should you do for an infant whose mom developed Varicella zoster in the critical 7-day window? | Give VZIG |
| What is the classic skin finding for infants exposed to varicella zoster in utero? | Cicatricial skin scarring |
What is “cicatricial” skin scarring? | Zig-zag scarring on the skin  
– with varicella, it often follows a dermatome  
*(Cicatricial literally means the type of scar barbed wire would make)*

If a pregnant mom has an outbreak of shingles, is her fetus at risk from the infection? | No

If a mom has a primary varicella zoster infection during pregnancy, when during her pregnancy is the fetus at risk for developing birth defects? | Weeks 8–20

**Which patient group at risk for bad Varicella complications should always get acyclovir IV?**  
**The immunocompromised**

If a “normal” child develops chicken pox, and is not unusually ill, when would you still consider giving acyclovir? | 2nd (or 3rd or 4th) case in one household

Is prednisone used to treat zoster (shingles) in kids? | No  
(�helpful for adults though)

Is acyclovir useful for the treatment of herpes zoster? | Yes – decreases lesions & pain  
(but probably *not* post-herpetic neuralgia)

**CMV causes serious disease in just two settings. What are they?**  
**Immunocompromised**  
&  
**Transplacental fetal infection** (~1 % of newborns are infected)

**What is the most common cause of “blueberry muffin” babies in the USA?**  
**Congenital CMV infection**

**What is the classic head CT finding for CMV congenital infection babies?**  
**Intracerebral calcifications that circumvent the ventricles** (go around the ventricles)
If mom already has IgG to CMV at the time she becomes pregnant, how does that affect the fetus’ chances of developing congenital CMV infection?  Very unlikely (<1 %)

Cicatricial skin scarring with limb atrophy sounds like a congenital case of Varicella zoster?

Sensorineural hearing loss and a blueberry muffin baby suggest congenital infection with what organism? CMV

“Heterophile-negative” mononucleosis-type illness is probably a case of CMV in a normal patient?

An adolescent patient with HIV presents with vision problems. What is the likely diagnosis? CMV retinitis

There is an important association between bone marrow transplant graft vs. host disease (GCHD) and which infectious diseases? CMV (A donor with antibodies to CMV + a recipient without CMV antibodies = increased risk of GVHD)

Does CMV cause infection/inflammation in various organ systems in significantly immunocompromised patients, such as transplant patients? Yes

If an AIDS patient develops CMV retinitis, what treatment is required? Valganciclovir for life unless the CD4 count recovers with HAART therapy (then treatment can be discontinued)

In what age group should you not trust the monospot test? <4 years old

How is mononucleosis defined, in terms of labs? >10 % atypical lymphocytes

Are the majority of EBV infections symptomatic or asymptomatic? Asymptomatic

EBV is associated with what cancer in Africa? Burkitt’s lymphoma (big mass on jaw)
EBV is associated with what two types of lymphoma?

Burkitt’s + B-cell lymphoma

Which EBV serological marker is often positive in patients with Burkitt’s that would not be expected in someone long recovered from the primary infection?

EA/R (EA stands for “early antigen” because antibodies to it appear early in EBV infection)

What sort of carcinoma is EBV linked with?

Nasopharyngeal

Is Epstein–Barr virus present for life after the initial infection?

Yes – persists in the B-cells

If a child has a febrile illness, is started on amoxicillin, then develops a rash, what has happened?

You have just diagnosed EBV infection (EBV + amox = rash)

( *popular test item!* )

There are several lab tests that are specific for EBV. What does a positive EBNA mean?

The patient is convalescent or done with EBV infection (EBV is Not Active!)

Which lab test tells you that your patient is acutely infected with a primary EBV infection?

IgM-VCA

Mnemonic:
VCA stands for “Very Clearly Acute”

( *popular test item!* )

Which serology is NOT positive with acute, primary, EBV infection?

EBNA (nuclear antigen – not yet making antigens to the deep viral structures in acute phase)

When do EBNA antibodies appear, in the course of EBV infection?

During convalescence

Which antibodies appear first in the acute, primary, EBV infection?

EAs (early antigens) –

Two types are used, named D (diffuse) & R (cytoplasmic)
| Question                                                                 | Answer |
|------------------------------------------------------------------------|--------|
| When does IgM to VCA (viral capsid antigen) appear, relative to when symptoms appear? | About the same time (IgG production begins shortly after, peaks 2–3 months later, then persists at a lower level for life). |
| In recent EBV infection (past 3–12 months), what serology pattern is expected? | IgG-VCA positive EBNA positive EA usually positive (but no IgM-VCA!). |
| If a patient has positive EBNA & IgG for VCA, but is EA negative, what is the likely EBV diagnosis? | Long-term (old) EBV infection – >12 months |
| Which patients sometimes express EA antibodies long term? | Immunocompromised with persistent or frequently reactivating infection |
| EBV patients will typically have what percentage lymphocytes in the 2nd to 3rd weeks of illness? | ≥50 % (about 85 % reach this level of lymphocytosis!) |
| On peripheral smear, what percentage of lymphocytes should be atypical, to meet EBV laboratory diagnosis criteria? | ≥10 % (most will have 20–40 %) |
| What sort of cells are the atypicals, generally? | Polyclonal activated CD8 cytotoxic-suppressor T cells |
| What does the “monospot test” actually test for? | Heterophile antibodies (it is designed to be a fast test, and just tells you if they are present, not how high the titer of heterophile antibodies is) |
| What is the down side to monospot testing? | Low sensitivity (around 75 %) |
| What are heterophile antibodies? | A mix of antibodies (polyclonal) produced in response to EBV, but not targeting it. These antibodies cause agglutination of RBCs from other species, such as horse, sheep, & cows – the tests to identify heterophile antibodies are based on this RBC agglutination |
Which patients often do not make heterophile antibodies with primary EBV infection?

Young ones <4 years old – & especially common in patients <2 years old

(about 80% of those <2 years old will not have heterophile antibodies)

Which serological marker can be used in young patients, to verify primary EBV infection?

EA/R antibodies

(Early Antigen R – R is a cytoplasmic antigen)

At what point in the illness are you most likely to get a positive heterophile test?

Weeks 2–3

Starts to decline in weeks 4 & 5

First week is often too early

If a patient is immunocompromised, and you cannot rely on immune-based test results to determine EBV infection, what other lab diagnostic can you use?

PCR for EBV DNA

(can be qualitative or quantitative, depending on what is needed)

EBV is also known as human herpes virus number ________?

Four!

A college student presents with cough, coryza, and conjunctivitis. He is developing a red maculopapular rash. What is it?

(popular test item!)

Measles!

Which patients are most likely to present with measles?

Unimmunized or received only one inactivated immunization

(popular test item!)

What is the other name for Rubella?

German measles

What are the hallmarks of a German measles infection?

Red rash + lymph nodes in a ring from ear to ear (postauricular-sboccipital LAD)

If a patient is exposed to rubeola/measles, what can you do to prevent infection in an unimmunized patient?

Immunoglobulin – you have 6 days to give it
Measles is most severe in which nutritionally challenged patient population?

(popular test item!)

Vitamin A deficient

Koplik spots on the oral mucosa go with which infectious disease?

Measles

Mnemonic: Think of a “weasel” in a “cop’s” uniform licking a child’s cheek to remember that Koplik spots go with measles.

Does rubella also have a special kind of spot?

Yes – Forchheimer spots (rose-colored spots on the posterior palate – 1st day only)

(not petechiae)

Which virus causes roseola?

HHV-6 (human herpes virus-6)

Which virus has recently been shown to be the cause of Kaposi’s sarcoma?

HHV-8 (human herpes virus-8)

What two endocrine disorders are patients with congenital rubella at special risk for developing (oddly enough)?

IDDM + Thyroiditis (IDDM risk increases 10–20 times)

How does the risk of acquiring congenital rubella infection vary according to the trimester the infection starts?

It’s a “U” – highest in first and third trimester

Although the risk of acquiring a congenital rubella infection is high in both the first and last trimesters, what determines how severe the effects of the infection will be?

The earlier the infection, the more severe the consequences
What are the usual consequences of third trimester infection with congenital rubella?

(popular test item!)

None!

Infection with congenital rubella is least common in the second trimester. When it does occur, what general types of problems usually result?

(2 categories)

(popular test item!)

Hearing loss or neuro problems

First trimester congenital rubella tends to cause what types of problems?

(several systems)

(popular test item!)

Hearing loss & neuro problems

Cataracts & cardiac problems

Fever, pharyngitis, conjunctivitis, cervical adenitis and rhinitis that affects a whole group of summer camp kids who’ve been swimming is __________?

Pharyngoconjunctival fever (adenovirus 3)

Adenovirus most commonly causes URI, but what other body systems does it sometimes affect?

(2)

Gut – diarrhea (types 40 & 41)

Bladder – hemorrhagic Cystitis (types 11 & 21)

Summer, swimming and group outbreaks of URI are associated with which virus?

Adenovirus 3 (pharyngoconjunctival fever)

If the boards presents an epidemic serious respiratory disease, and the cause is identified as a coronavirus, what is the diagnosis?

SARS (severe acute respiratory syndrome)

What kind of inflammatory process does RSV cause in the lung?

Interstitial pneumonitis

If a child requires prophylaxis for RSV, what is given?

RSV antibodies

(popular test item!)
| Question                                                                 | Answer                                                                                     |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Should ribavirin be used with RSV infection?                           | No – Recent studies showed no effect                                                       |
| What sort of infection does parainfluenza virus usually cause?         | Same as RSV, but occurs all year                                                           |
| Which types of influenza are the main causes for concern?              | A + B                                                                                      |
| Amantadine/rimantadine are mainly effective against which sorts of influenza? | Type A                                                                                     |
| Mnemonic: A is for Amantadine                                            |                                                                                             |
| What is the best way to prevent influenza infection?                   | Immunize!                                                                                  |
| Is immunization against influenza recommended for children <9 years old?| Yes                                                                                         |
| (popular test item!)                                                   |                                                                                             |
| What is the influenza immunization schedule for kids <9 years?         | 2 shots, 1 month apart                                                                       |
| The newer neuraminidase anti-influenza drugs are effective against which influenza types(s)? | Both A + B                                                                                  |
| (but they’re not wildly effective – best when used early in the infection) |                                                                                             |
| For which age groups are the two neuraminidase anti-influenza drugs recommended? (different for each drug) | Oseltamivir (Tamiflu®) – treatment from 14 days old prophyllaxis from 3 months old          |
| Zanamivir(Relenza®) – treatment from 7 years old prophyllaxis from 5 years old |                                                                                             |
| What contraindication to the use of zanamivir (Relenza®) should you screen for? | Allergy to milk protein                                                                    |
| On the board exam, which infectious agent causes hand–foot–mouth disease? | Coxsackie virus                                                                             |
| (can also be enterovirus, but not usually)                             |                                                                                             |
| In infants, hand–foot–mouth disease also sometimes affects what part of the body? | Diaper area                                                                                 |
What happens in hand–foot–mouth disease?

- Rash, sometimes with vesicles, on hands & feet
- Vesicles on lips, tongue, gums, buccal mucosa

The board is especially fond of presenting hand–foot–mouth disease in what format?

Photo section!

If a patient is presented with myocarditis or pericarditis, and the patient is from the USA, what is the likely cause? (infectious agent)

Coxsackie virus

Acute hemorrhagic conjunctivitis gives your patient some scary looking eyes. What usually causes it?

Enterovirus (#70) & Coxsackie virus (type A24)

What infectious agent causes herpangina?

Coxsackie A (not herpes)

What does herpangina look like?

Little vesicles on pharynx, tonsils, uvula

Why is herpangina a problem in pediatrics?

Hydration – the throat gets very sore & they won’t drink

If you are asked to differentiate herpangina from herpes, what is the main differentiator?

Herpangina causes a sore throat – Herpes usually cause skin/labial sores

Why should you avoid treating Salmonella with antibiotics, unless it is medically necessary?

Increases likelihood of carrier state

What is the best possible specimen to give you the best chance of identifying TB infection, if it is present?

Early morning gastric aspirate

If a child’s fever resolves suddenly, and a red spotted rash appears equally suddenly, what is the infection?

Roseola (human herpes virus 6 – HHV6)

Which infection sometimes causes Pastia’s lines, and what are they?

Scarlet fever – increased erythema in the creases of flexor surfaces
An immigrant child from Haiti presents with an asymmetric flaccid paralysis, loss of DTRs, and a fever. What is the disorder?

Polio

Does the paralysis that accompanies polio develop slowly or rapidly?

Rapid – It is maximal within 4 days

To qualify as a case of polio, there must be neurological deficits after what length of time?

60 days

If a human is infected with rabies, will he/she develop hydrophobia (fear of water) like animals do?

Yes – perceiving food or water causes larynx/pharynx spasms – that’s why infected animals/humans fear them

How is rabies definitively diagnosed?

Nerve biopsy from the “nape of neck” (back of neck) shows “Negri bodies”

What is the risk of rabies from bites of fox, skunk or bats in the USA?

High – assume they’re rabid (unless you catch them and check their brains)

Do ferrets carry rabies?

Yes

If a domestic pet is not rabies immunized, and it bites someone, does the person need all of the rabies shots?

No – observe the animal for 10 days – if it remains well it doesn’t have rabies

(The exception is a high-risk bite to face or neck – start immunizations!)

Do rodents or rabbits carry rabies?

No

If rabies prophylaxis is indicated, what do you give?

IgG & vaccine

(IgG is given once, vaccine is a series)

Is it alright to give rabies IgG and rabies vaccine at the same site on the body?

No!

That would be silly because they’ll just bind to each other & not do your patient any good!

(popular test item!)

On the boards, if an adolescent male gets mumps, what complication will he develop?

Orchitis
On the boards if an adolescent female gets mumps, what complication will she develop?

- Oophoritis or mastitis

Is the oophoritis that sometimes occurs with mumps likely to cause female infertility?

- No (in reality, orchitis rarely does either)

Parotid gland swelling, either unilateral or bilateral, should make you think of what three possible etiologies?

1. Mumps (uni or bilateral)
2. Parotitis (usually unilateral)
3. Bulimia

Mumps commonly affects which organ systems?

- Parotid gland
- Gonads
- CNS (deafness sometimes)

Polio infection is usually accompanied by what sort of typical CNS infection signs?

- Meningitis signs
  (It’s aseptic, if you do the tap)

What are the two patterns of paralysis in polio paralytic disease?

- Spinal – proximal strength most affected
- Bulbar – swallowing, respiration, & brain-stem affected

What is the reservoir for Hantavirus infection?

- Rodents

Why is Babesiosis associated with the “maltese cross” buzzword?

- Because there are usually multiple organisms in the cell, & sometimes they arrange themselves like a cross

What causes 5th Disease?

- Parvovirus B19

With 5th Disease (erythema infectiosum), is it alright for the child to return to school if they have the rash?

- Yes – When the rash appears they are no longer infectious!

How do you make the diagnosis of parvovirus B19 infection, based on labs?

- IgM (or IgG) to the virus, or PCR
  (most cases are diagnosed clinically)

How does parvovirus B19 affect a fetus if the mom contracts the infection during pregnancy?

- Usually no effect – 5–10% fetal loss
If a parent or grandparent presents with polyarthritis, especially of finger joins, +/- a rash, what are they trying to tell you the child had/has?

Parvovirus B19

An adolescent from the South western USA presents with a pneumonia that develops after a flu-like illness. It sounds like Staph pneumonia superinfection, except that the vignette includes the hematocrit (high), platelets (low), and albumin (low). What is it?

Hantavirus

How is HIV most commonly transmitted in the developing world, and often in the US, as well?

Heterosexual contact

When did the USA begin effective HIV screening of the blood supply?

1985

When does most vertical HIV (mother to infant) transmission occur?

Labor & delivery

Is it alright for HIV+ moms to breast feed?

No

How is spread of HIV to health care workers prevented?

Universal precautions

In a boards vignette, you are given a patient who has just been diagnosed with TB. What other test would you like to do? (popular test item!)

HIV screening!

A sickle cell patient develops an aplastic crisis. What virus is likely to be responsible?

Parvovirus B19

Are hemophiliacs in the pediatric population likely to be HIV infected?

No – The blood supply was effectively screened beginning in 1985 & recombinant factors are now used

At what age can standard screening tests for HIV be used?

18 months
### What are the standard screening tests for HIV?

ELISA, then if positive confirm with Western blot

Mnemonic:
Think of “Elisa” as the receptionist—she does the initial screening.

### In children 0–18 months old, how can you check for HIV infection?

PCR testing for HIV DNA or RNA

(96% sensitive & 99% specific at 1 month old)

### If an infant may be HIV infected, when should you attempt to check for HIV status?

Repeatedly –
1st in first 48 h of life
2nd attempt at 1 month
3rd attempt at 3–6 months

(some recommend an additional attempt at day 14, to identify more infants earlier)

### If the possibly HIV infected infant has a positive PCR test, what should you do?

Repeat the PCR –
Two are required to confirm the diagnosis

### What do you need to confirm that the infant is not HIV infected?

Requires two negative HIV PCRs, at least 1 month apart, in an infant 6 months of age or older

OR

At least two negative PCR results in an infant 4 months or older, who is not breast feeding (first test must be from after 1 month old)

### Infants of HIV positive mothers should also be serologically screened for what additional disorders?

Hep C (along with Hep B, of course)
Syphilis
Toxoplasmosis

### A child is referred to you because HIV screening has come up positive. Mom is known to have HIV. The child is 6 months old. What do you want to know about the testing?

Whether the PCR test was done

(The ELISA & Western blot rely on IgG, which is always positive in infants of infected moms due to transplacental IgG transfer)
Hantavirus patients will often have a full recovery, if proper supportive care is provided. What are the two problems that put Hanta patients at risk of dying?

How likely is an HIV infected mom to pass her virus to her infant during pregnancy and delivery, if she does not take antiretroviral medications?

If an HIV positive mom takes antiretroviral medications during pregnancy, can she significantly lower the probability of vertical transmission to her infant?

What two feeding practices must HIV positive mothers be warned against, to reduce chances of postnatal HIV transmission?

If an infant has frequent candidial infections, or persistent lymphadenopathy or HSM (hepatosplenomegaly), what diagnosis should you consider?

Parotitis in the first year of life is unusual and should make you consider ________?

At what CD4 count should patients be considered severely immuno-compromised?

Are there situations in which a CD4 count greater than the usual cutoff should be used to designate severe immunocompromise/AIDS?

Pulmonary edema & Impaired cardiac function

20–30 % chance

Yes – to a few percent!!

Breast feeding (assuming safe infant formula available)

Premastication (chewing food for the baby) – proven transmission link!

HIV infection

HIV infection

<200

Yes – young children

<12 months = <750 CD4s

1–5 years old = <500 CD4s
In addition to tuberculosis, what other disease presentations in adolescents should make you consider HIV infection?

1. ITP
2. Serious bacterial pneumonia
3. Recurrent zoster

What is the most common opportunistic infection for HIV patients?

*P. carinii*
*(now renamed P. jiroveci! but the disorder is still called “PCP”!)*

What are the two best medications for treatment of *P. jiroveci* (formerly *P. carinii*)?

TMP/SMX

Or

IV Pentamidine
*(aerosol is used for prophylaxis, not treatment)*

When is prednisone indicated as part of the treatment for pneumocystis?

*Pa O₂ < 70 mmHg*

Should neonates or very young infants who may have HIV be prophylaxed for PCP? (*P. jiroveci*)

*Yes!*

If an infant is HIV positive, or the HIV status is still unclear, what is appropriate PCP prophylaxis?

Give TMP/SMX until confirmed HIV negative

Or

Until 12 month old if HIV positive *(reassess regimen at 12 months)*

At what age should you start PCP prophylaxis?

*Most sources recommend 6 weeks*

Should infants at risk for HIV infection be started on treatment before the HIV infection is confirmed?

*Yes! Start zidovudine as soon as possible after birth!*

Begin cART (combined antiretroviral therapy) when the infant is older, even if initial testing is negative
By what age should an infant begin on a combination HIV treatment regimen? Current research indicates beginning before 12 weeks of age provides important health & developmental benefits!

(In some cases, cART is started much earlier, but safety & outcome data is limited. Functional “HIV cure” has been reported in one child whose cART was begun at 30 h)

After the age of 1 year, what should guide your decision as to whether PCP prophylaxis is needed or not? CD4 criteria for severe immunosuppression

(<500 aged 1 thru 5 years)
(<200 older than 5 years)

The children aged 1–5 years must keep their count at or above 500 for 3 months to discontinue prophylaxis

If your patient needs TMP/SMX prophylaxis for PCP, but can't tolerate it, what alternative medication can be used? Dapsone – check for G6PD deficiency before you use!

Atovaquone is also an option

What is a “banana gametocyte” on a blood smear, and what does it signify? • An RBC elongated like a banana, due to malaria parasite(s) in it!

• Usually P. falciparum

If you give dapsone, you must first check for what condition? G6PD deficiency

Which children can use pentamidine for PCP prophylaxis? Only those older than 5 – It is aerosolized & must be used properly

If you are evaluating an HIV positive patient for TB, and the PPD is negative, how should you interpret this? Encouraging, but not definitive – Patient may be anergic (non-reactive)

MAC/MAI are opportunistic lung infections. When might a pediatric patient need prophylaxis for them, and what do you give? • Severe immunocompromise

• Give azithromycin or clarithromycin
What two recurrent types of candidal infections do the boards like to present to suggest HIV infection?

Thrush
&
Diaper rash (dermatitis)

Molluscum contagiosum – what does it look like?

Small papules/vesicles with umbilicated centers (dot in the center) – Not red

A lot of difficulty with molluscum contagiosum should make you think about ____________?

Possible HIV infection

Bad diarrhea can develop with isospora infection in the immunocompromised. How is it treated?

TMP/SMX

Cryptosporidium tends to cause a severe and chronic diarrhea in the immunocompromised. How is it treated?

Nitazoxanide is first line (Paromomycin with azithromycin is another option, but much less effective in clearing the parasites)

What should patients recovering from cryptosporidium be instructed NOT to do, in terms of activities?

NO Swimming until 2 weeks after symptom resolution – Crypto now causes more than 50 % of all US public swimming pool-related outbreaks

What unusual attribute of cryptosporidium allows it to be so successful with swimmers?

It is not affected by chlorine!

What is the treatment for toxoplasmosis when it activates and affects the eyes or CNS?

Pyrethamine + Leucovorin + Sulfadiazine

Mnemonic: PLS help me to see!

Steroids are also sometimes given

Folinic acid (the active form of folate – folic acid will not work)

FOLINIC ACID = LEUCOVORIN (same thing)
| Question                                                                 | Answer                                                                                       |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Extended use of pyrimethamine should always be combined with what supplement? | Folinic acid (to prevent anemia)                                                             |
| If a health care worker has been exposed to meningococcus, does he/she need chemoprophylaxis? | Only if exposure to droplets was likely (e.g., intubation, mouth-to-mouth)                   |
| Pay attention – This is a change!                                        |                                                                                               |
| Aside from the CD4 count, how do you know when you should start antiretroviral therapy? (3 ways) | Symptoms – The patient becomes symptomatic (AIDS defining illness or significant symptoms)   |
|                                                                      | Age – infant <12 months old                                                                  |
|                                                                      | RNA level – >100,000 plasma HIV RNA level                                                      |
| The side effect most associated with AZT is ____________?               | Anemia/pancytopenia                                                                           |
| Which reverse transcriptase inhibitors tend to cause pancreatitis and peripheral neuropathy (painful)? | ddI + ddC                                                                                     |
| Mnemonic: The “D’s” go with the “P’s,” (as in “poopy diaper!”)           |                                                                                               |
| Abacavir is a type of reverse transcriptase inhibitor. What is it most important to know about this med? | The hypersensitivity reaction consists of a flu-like illness and rash – giving the med again after this reaction = death |
| Mnemonic: Sudden death will take you “aback” (shock you)!                |                                                                                               |
| How can you prevent the abacavir reaction?                              | It occurs only in patients with a particular HLA type: HLA-B*5701 – screen for the HLA type before starting the med |
| Which patients are most likely to develop the abacavir reaction?        | European descent (about 5% carry the HLA-B*5701 type)                                         |
| Efavirenz is an NNRTI med (non-nucleoside reverse transcriptase inhibitor). What is it most important to know about this med? | TERATOGENIC                                                                                   |
An adolescent HIV patient presents with kidney stones. What med is he taking?

Crixivan®
(Indinavir)

A boards vignette tells you that your patient has just reached the point with HIV where antiretrovirals need to be started. Should you start treatment with a single drug or multiple drugs?

Multidrug “cART” –
Stands for “combination AntiRetroviral Therapy”
(sometimes abbreviated ARV for AntiRetroViral therapy)
(start with three)
(In the USA, testing for resistance is recommended)

How do you know which combinations of antiretrovirals are UNacceptable?
(2 rules)

1. don’t choose an answer with ddC in the choices
2. any answer with ZDV/D4T is wrong!

All cART regimens include a “dual” nucleoside/nucleotide reverse transcriptase inhibitor, a two-drug combination referred to as the “backbone.” Which combination is acceptable for children in any age group?

Zidovudine
+ Lamivudine or Emtricitabine

At what age may abacavir replace zidovudine?

3 months or older
(remember to check HLA type before beginning abacavir)

Tenofovir can replace zidovudine or abacavir in the adolescent cART regimen. What additional benefit does tenofovir have, in terms of antiviral efficacy?

It is also effective against hepatitis B
(for those patients with both)

In addition to tenofovir, which other cART medications have activity against hepatitis B?

Emtricitabine & lamivudine

In HIV, it is best to have a level of viremia so low that you can’t detect it. At what level is the viremia considered to be really high?

>50,000 copies (per mL)
When should you switch drug regimens for HIV suppression?
(3 situations)

- Drug toxicity
- Clinical worsening
- Significant worsening in labs (meaning viral load climbing or not suppressed by treatment)

The CDC defines three levels of HIV infection. What are they, & what defines each level?

Levels A, B, & C –
- A – Asymptomatic & no history of symptoms
- B – Symptoms attributable to T cell dysfunction or HIV itself, or symptoms that were complicated by HIV infection
- C – AIDS-defining opportunistic infections have occurred

A nurse spilled urine from an HIV patient onto her skin. She had some scratches on her skin. Should she take post-exposure prophylaxis?
(popular test item!)

No (urine doesn’t count)

If a health care worker is exposed to bloody fluid, and the skin exposed was not completely intact, should the healthcare worker take post-exposure prophylaxis?
(popular test item!)

Yes

What is the main antiretroviral given to pregnant women?

Zidovudine

How should antiretroviral medication be given during labor and delivery (PO, IM, IV, PR)?

IV

Which medication, if any, should newborns at risk for HIV be given?

Zidovudine (until 6 weeks of age)

Mnemonic:
Makes sense – it’s what their moms are likely to be taking!
In what circumstances will you need to give newborn HIV prophylactic treatment with two different drugs?  

If the mother has NOT been taking combination antiretroviral therapy – Baby must then receive 6 weeks of zidovudine  

+  
3 doses of nevirapine in the first week of life

How long should the newborn remain on the HIV medication regimen?  

6 weeks  
-  *start within 6–12 h of birth, if possible*

Should premature infants at risk for HIV also be started on a prophylactic medication regimen?  

Yes, the same regimen as for term infants

Should infants with HIV be started on the same immunization schedule as other infants?  

Yes – Modify only for live vaccines, if severe immunocompromise is present

If a pregnant mom is diagnosed as HIV positive during her pregnancy, how should her preventative plan be different from a non-pregnant HIV positive mom?  

No different –  
*Except avoid teratogens efavirenz & ddI/d4T*

What is the best predictor of long-term outcome in HIV, for a patient who is still early on in the disease process?  

Viral load

What is HAART? (used in HIV treatment)  

**Highly Active Anti-Retroviral Therapy**  
(combination therapy utilizing drugs with six different types of mechanisms to limit the virus’s success as much as possible!)

Kaposi’s lesions may occasionally be seen in adolescents with HIV. What causes Kaposi’s?  

**HHV-8**  
(Human Herpes Virus #8)
An adolescent presents with a flu-like syndrome with pharyngitis and rash. The question mentions that the adolescent is sexually active. What should you investigate?

(\textit{popular test item!})

What is the main use for inhaled pentamidine?

Prophylaxis for PCP in those >5 years old

(for treatment, use IV)

An HIV positive patient is being treated for a bad case of PCP, and begins to seize. What should you suspect?

Hypoglycemia – (bizarre side effect of pentamidine – it destroys islet cells → either high or low glucose)

How does HIV infection affect CNS development in very young children?

The majority have some level of encephalopathy (directly caused by HIV)

What has the impact of HAART been on CNS effects of HIV in the very young?

It prevents or slows it

(highly active anti-retroviral therapy)

A patient from El Salvador, HIV positive, with pneumonia, palatal ulcers, splenomegaly, and bone-marrow suppression = what diagnosis?

Histoplasmosis

If a patient is started on PCP prophylaxis, when is it alright to stop prophylaxis?

CD4 count >200 for more than 3 months, following initiation of HAART regimen

What is the gold standard for diagnosing PCP?

Silver staining of samples from bronchoscopy or bronchoalveolar lavage

Are there indications for stopping MAC/MAI prophylaxis in an HIV patient, if the patient actually had the infection?

Controversial – For the boards, no, do not stop prophylaxis

What is the most common cause of cardiac death due to endocarditis infection?

CHF
If valve dysfunction is significant enough to harm ventricular function in a patient with SBE, what is recommended? Surgical correction
(Conduction deficit is also a reason for surgery)

What is the most important test for diagnosing endocarditis? Blood cultures

**What two organisms most commonly cause endocarditis in children?**

#1 Strep viridans

&

#2 Staph aureus

When doing a bacteremia work-up, which children should definitely get a urine culture? Boys <6 months, Girls <12 months

What is the most common pathogen for UTIs in very young infants (less than 2 months old)? E. coli

Bacterial gastroenteritis is not very common in infants <2 months old. When it happens, what is the likely bacterium? Salmonella

What are the most common causes of bacteremia in infants, birth to 2 months old? Group B Strep & E. coli

(Listeria is not as common but must be covered)

Patients with surgical valves (prosthetic valves) are most likely to develop endocarditis due to what organism? Staph epidermidis

If a patient has endocarditis, he or she nearly always has what other problem? Either congenital or rheumatic heart problems (or a history of instrumentation)

**If a patient clinically appears to have endocarditis, but no organisms are detected on blood culture, what causes should you suspect?**

HACEK
(Haemophilus Actinobacillus Cardiobacterium Eikenella Kingella)
Why are HACEK organisms so tough to culture?
They’re “fastidious” Gram negatives, and take >7 days to grow!

In addition to HACEK organisms, are there any other causes of culture negative endocarditis you should know about?
Fungus
Q fever (*Coxiella burnetii*)
Legionella
Chlamydia

What are Janeway spots, and what do they indicate?
• non-tender spots on hands and feet
• acute bacterial endocarditis

Where are Roth spots found, and what do they signify?
• white spots on the retina
• subacute bacterial endocarditis (they develop late in the course)

The three famous signs associated with endocarditis are: _______ _______ & _______?
Roth spots
Janeway lesions

&
Osler nodes (usually subacute endocarditis)

Which of the famous signs of bacterial endocarditis is/are painful?
Only Osler nodes
Mnemonic: Remember “only Osler offends,” or think about how painful it can be to write up a good Oslerian H&P!

If a patient with perfectly normal valves develops endocarditis, what is the likely pathogen?
Staph aureus

Overall, the most common pathogen to cause endocarditis in the pediatric population is _________?
Strep viridans
(usually in hearts with congenital or rheumatic problems)

What is the recommended treatment for this most common pediatric endocarditis pathogen?
Penicillin G
Or
Ceftriaxone
(other regimens are also possible)

Endocarditis + prosthetic valve usually = what kind of treatment?
Surgical
(The exception is *S. epidermidis* with subacute presentation)
Is vancomycin a preferred medication for treatment of endocarditis?

No –
It is used when necessary (due to PCN allergy or methicillin resistant species), but it is overall less effective.

If a HACEK organism causes endocarditis, what is the recommended treatment regimen?

Ceftriaxone
Or
Ampicillin with gentamicin

Most other causes of pediatric endocarditis can be treated with which two antibiotic regimens?

Ampicillin & gentamicin
Or
Penicillin G (high doses required for resistant organisms)

How long is the treatment regimen for endocarditis?

Generally 4 weeks

Should you wait to get CSF cultures before starting antibiotics in suspected bacterial meningitis?

No!
(The CSF is still good for culture for a while after antibiotics are started, and you can’t take chances with meningitis!)

For AIDS patients, or others with severe immunocompromise, be sure to ask for what unusual lab evaluation of CSF, if meningitis is suspected?

India ink or cryptococcal antigen (both for possible *cryptococcus*)

If a boards vignette tells you that your CSF tap has “what appear to be white cells swimming in it,” what is the diagnosis?

Amebic meningitis (yuck!)

Swimming in a cow pond or “brackish” water is associated with what type of meningitis?

Amebic
(Nigleria is the organism)

Encephalitis that results in death is usually due to what pathogen?

Herpes simplex

What is the most common general cause of encephalitis (for those cases that have an identified cause)?

Arboviruses
(St. Louis, Eastern equine, West Nile, etc.)
Diarrhea occurring with antibiotic use is usually due to _______? A side effect due to change in gut flora

Colitis following antibiotic use is often due to _______? C. difficile (assay for C. diff cytotoxin in stool)

History of seafood ingestion or exposure to the Gulf of Mexico + liver failure = infection with what organism? Vibrio vulnificus (also causes skin lesions)

(popular test item!)

Shellfish diarrhea is often the work of which bacterial family? Vibrio’s

If you need to work up a patient with diarrhea, what stool studies should you send? Fecal WBCs
Stool C&S
O&P

Diarrheal outbreaks on cruise ships are usually due to which pathogen? Noroviruses (formerly called Norwalk-type viruses)

(popular test item!)

When should you definitely avoid antimotility agents with diarrhea patients? Bloody diarrhea or positive fecal WBCs

What non-infectious cause of diarrhea also causes WBCs to end up in the stool? IBD (Inflammatory Bowel Disease)

Noroviruses (Norwalk-type viruses) are also associated with what food products? (2 categories) Clams & oysters
Leafy greens

In an adolescent or young woman, is pyuria alone enough to treat for UTI? Yes (no C&S needed)

For which patient groups is it alright to treat for UTI, if all they have is asymptomatic bacteremia? Pregnant
Diabetic
Transplant/neutropenic

What organisms are commonly found in brain abscesses? Pneumococcus
H. flu
Anaerobes (usually coming from nearby infections like sinusitis)
What are the four most common causes of diarrhea in US children?

Norovirus is the main cause (especially in children ≤18 months old)
Rotavirus (dropping due to vaccination)
Adenoviruses (types 40 & 41 mainly)
Astroviruses

What are the top four causes of childhood diarrhea in the world?

Rotavirus
Shigella
Cryptosporidium
ST-ETEC (Toxigenic E. coli with Shiga toxin)

How long should you treat an uncomplicated UTI in a child or adolescent?

3–5 days (TMP/SMX preferred, nitrofurantoin or amoxicillin/clavulanate also good options)

Which aspect of a child’s history can give you a clue as to whether he or she is likely to have an antibiotic resistant UTI?

History of prior antibiotic use (e.g., for otitis media) – Kids with frequent prior antibiotic use are more likely to develop UTIs resistant to those antibiotics

Is ciprofloxacin alright as a second-line therapy for UTI in children?

Yes – the CDC approved it for kids ages 1–17 with UTI in 2004

Which organism is associated with renal stones when it causes UTIs?

Proteus (a “urea-splitting organism”)

If a pregnant patient develops pyelonephritis, what is the correct management?

Admit for IV antibiotics (cephalosporins, ampicillin, aminoglycosides are okay)

Can children with pyelonephritis be treated as outpatients?

Yes – IF
The patient is nontoxic appearing & the UTI is uncomplicated (no stones, etc.)
There is a reliable & competent caregiver
Able to follow-up in 24 h
Car & telephone available
The patient can take PO & has no need of hospital-based medical support
| Question                                                                 | Answer                                                                                                                                                                                                 |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What is the story with Bactrim® (TMP/SMX) in pregnancy?                 | Linked to kernicterus in late pregnancy and in young infants who are breastfeeding                                                                                                                     |
| Which organism is the “fishtank bacillus”?                             | M. marinum (Mycobacterium marinum)                                                                                                                                                                    |
| Large hemorrhagic bullae, plus other skin lesions that look like an “angry volcano,” are associated with which Vibrio species? | Vulnificus! Mnemonic: Sounds like “volcano”                                                                                                                                                            |
| If a vignette sounds like it’s supposed to be osteomyelitis, but an X-ray of the area provides no evidence for osteomyelitis, what should you assume? | It’s still probably osteomyelitis (it takes 10–14 days for changes to appear on x-ray)                                                                                                                   |
| What is the earliest sign of osteomyelitis on x-ray?                    | “periosteal elevation” (inflammation lifts the periosteum up from the bone enough to be seen separately)                                                                                                |
| If you suspect osteomyelitis, but a (pyrophosphate) bone scan is negative, what should you assume? | A negative bone scan rules out osteomyelitis                                                                                                                                                           |
| If you suspect osteomyelitis, and obtain a positive bone scan, what should you assume? | Nothing – Positive bone scan supports osteomyelitis but can also indicate malignancy, fracture, etc.                                                                                                   |
| Which other radiological study is also highly sensitive for detecting osteomyelitis, but more specific than a bone scan? | MRI – Also shows soft tissue & joint complications                                                                                                                                                     |
| How should you identify the causative organism in osteomyelitis?        | Bone biopsy/scraping or fluid for culture & Gram stain                                                                                                                                                 |
| If an osteomyelitis is draining pus through a fistula, can you use a culture and sensitivity of the fluid to identify the organism? | No – Oddly enough, it will not consistently grow out the correct (causative) organism                                                                                                                    |
Osteomyelitis – IVDA – pelvic or vertebral sites = what organism? Pseudomonas
(or possibly Staph aureus)

Menstruating adolescent – sexually active – fever – joint paint = what disorder? Gonorrhea septic arthritis

Septic arthritis is most common in which patient group? Kids <3 years old

How is septic arthritis treated? (two components)
• Drain infected joint fluid
• IV Abx for 6 weeks
(open drainage in OR sometimes performed)

An epidemic of any illness among patients in the hospital is usually due to? Spread via the worker’s hands

If a patient develops a line infection, we ordinarily pull the line, culture the catheter (tip), and give antibiotics. In what situations may the line be left in place while antibiotics are given to clear the infection? When the line is essential to patient care & cannot easily be replaced – this is called “salvage” of the catheter

If “line salvage” is attempted, what is special about the way the antibiotics are administered? They must be given via the “antibiotic lock technique” – if that is not possible, then the antibiotics must be administered through the catheter suspected to be infected

What is the antibiotic lock technique, in general terms? High concentrations of an appropriate antibiotic are instilled directly into the lumen of the infected catheter
(heparin may or may not be used along with the antibiotic)

If line salvage is attempted, how do you know whether it is successful or not? Obtain blood cultures after 72 h of antibiotics effective for the infecting organism have been given – if two sets of cultures are positive, the line needs to be removed
Note: one set of positive cultures is enough in a neonate
How do quinolones interrupt bacterial multiplication?
Disrupt function of DNA gyrase (DNA cannot be put back after it is used for protein synthesis)

Which antibiotics block ribosomal subunits, preventing the bacteria from producing proteins?
Macrolides, Oxazolidinones, Aminoglycosides and Tetracyclines
Mnemonic: MOAT – Think of antibiotics forming a MOAT around the body blocking disease

AT 30, antibiotics stop disease, at 50, you need MO’ (more). This mnemonic is supposed to help you remember which antibiotic classes act on the 30s and 50s ribosomal units. How does it work?
AT 30: Aminoglycosides and Tetracyclines bind the 30s unit
At 50, MO: Macrolides and Oxazolidinones (linezolid) bind the 50s

What treatment protocol is essential to decreasing the risk of HIV transmission from mothers to infants?
IV Zidovudine during labor/delivery & Zidovudine after birth (PO) for the infant

Which HIV infected mothers may not need IV zidovudine during labor & delivery?
Those on cART with viral RNA levels consistently ≤1,000, and good continued adherence to the cART regimen at time of delivery

Should the babies of these mothers still receive zidovudine after birth?
Yes – But only zidovudine (nevirapine is not required)

Is an elective c-section helpful in reducing HIV transmission?
Yes, at 38 weeks (to avoid spontaneous delivery) if the mother’s viral RNA level is >1,000 (for mothers with low viral RNA levels, benefit is unclear)

If an infant born to an HIV positive mother presents with severe neurological findings, or is otherwise severely ill without explanation, what HIV-related cause should you consider?
Mitochondrial dysfunction due to exposure to cART medications (NRTIs, in particular)
At what point should pneumocystis pneumonia prophylaxis be started in a possibly HIV-positive infant?

When the zidovudine regimen has been completed (generally around 6 weeks – some infants may receive just 4 weeks of zidovudine is the mother’s viral load was very well controlled)

What hematological test should routinely be obtained on infants born to mothers on cART & zidovudine?

CBC for hematological abnormalities

What is the main way to diagnose endocarditis?

Blood cultures

How do you know whether a head CT is required before doing an LP for possible meningitis?

Blood cultures

Focal neurological findings = CT otherwise you don’t need it (and shouldn’t get it! Delay in care!)

How is chronic meningitis defined?

Slow onset with symptoms evolving over >7 days

If a meningitis patient has focal findings and therefore needs a head CT before you can LP, what do you do?

(3 steps)

1. Start antibiotics
2. Get the head CT
3. LP if there isn’t a mass

What are the components of the blood–brain barrier?

1. Arachnoid membrane
2. Choroid plexus epithelium
3. Endothelia of the cerebral microvasculature

Which of the three portions of the blood–brain barrier is most likely to be breached (leak)?

Choroid plexus (unless there was trauma, of course)

If a vignette mentions that the patient has had multiple bouts of meningitis, and has a past history of head trauma, what are they trying to tell you?

There is an intracranial communication with something like a sinus, due to the old trauma
If a patient is specifically described as having repeated bouts of meningitis due to *N. meningitidis*, what should you suspect?

*(popular test item!)*

**How do you test for complement deficiency?**

A complement deficiency

**How do you test for complement deficiency?**

CH50 or CH100

*(tests the classic hemolytic pathway for 50% or 100% lysis of sheep RBCs)*

&

AP50

*(testing the alternative pathway)*

**A boards vignette tells you that your patient has *N. meningitis*. It asks, “what else do you want to look for?”**

*(popular test item!)*

**Which organisms are splenectomized patients at special risk to develop?**

(terminal complement deficiency)

Encapsulated organisms

– *S. pneumoniae*

– *H. influenzae*

– *N. meningitidis*

Splenectomized patients are also at special risk to develop bad infection from which parasitic disorders?

*Babesiosis & malaria*

Why should a splenectomized patient be especially worried after a dog bite?

*More susceptible to serious Capnocytophagia*

Aseptic meningitis means the same thing as ________ meningitis?

*Non-bacterial (almost always viral)*

**What do you expect to see in the CSF of a patient with bacterial meningitis?**

↑ neutrophils

↑ protein

↓ glucose

**What do you expect to see in the CSF of a patient with TB meningitis?**

Basically very similar to bacterial, except more monocytes than neutrophils
Syphilis can occasionally produce meningitis. What will the CSF show?

Low everything-
WBCs – a few
Glucose – low
Protein – low

In aseptic meningitis, what should the CSF profile look like?

Some WBCs – more lymphs than PMNs
Glucose – nl
Protein – nl

If a vignette mentions that an LP was done, and there was a predominance of PMNs, but that the LP was repeated a little later and showed mainly lymphocytes, what are they trying to tell you?

It’s viral – PMNs still predominate very early (but of course, no bacteria will be seen)

Peds boards sometimes give you a table of antibiotic susceptibilities, or the same information in the vignette. What number indicates that the organism is definitely susceptible to a particular antibiotic?

≤0.5 (μg/ml)

If you are treating a meningitis patient with Strep pneumo, and the sensitivity comes back at 1.0-2.0 for ceftriaxone, what should you do?

Continue ceftriaxone & Add vancomycin

If your pneumococcal meningitis patient has bacteria sensitive to ceftriaxone, but you have already started him or her on ceftriaxone + vancomycin, what should you do?

Stop the vanc (continue with ceftriaxone only)

If a sensitivity comes back in the 1.0 – 2.0 μg/ml area, how should you interpret it?

The organism is resistant – but multidrug therapy may still work

In general, on the boards, what is the guiding principle in antibiotic selection?

The simplest, oldest, least sophisticated agent that will kill the bug is preferred
Gram positive diplococci = what organism?  
(usually)  
(popular test item!)  

Pneumococcus

Gram positive rods = what organism?  
(popular test item!)  

Listeria  
(ampicillin kills it)

Gram-negative rods are usually which organism?  
(popular test item!)  

E. coli

Pleiomorphic rods on micro mean you are dealing with what pathogen?  
(popular test item!)  

H. flu

What is the most common sequela of meningitis?  
Deafness (about 10%)

Which of the typical bacterial meningitides is the mildest?  
Neisseria meningitidis

When is Neisseria meningitidis a highly virulent infection?  
When it is systemic (bacteremia)

How is H. flu meningitis treated?  
3rd generation cephalosporin & Dexamethasone (give early, before 1st dose of antibiotic if possible)

What is the point of giving dexamethasone with certain forms of meningitis?  
It reduces the probability of deafness

If you get a scenario with an H. flu meningitis patient, do household members need any prophylaxis?  
Yes (Rifampin)
If you need to prophylax a pregnant close contact of a *Neisseria meningitidis* patient, what drug should you use?  
Ceftriaxone

If you need to prophylax a non-pregnant adult close contact of a *Neisseria meningitidis* patient, what drug should you use?  
Ciprofloxacin (or rifampin) (Cipro is a shorter regimen)

The drug of choice for *Neisseria meningitidis* chemoprophylaxis for those <18 years old is _________?  
Rifampin

If a patient has a chronic neutrophilic meningitis, what organisms are likely culprits?  
Fungi  
Actinomyces  
Nocardia  
(3)

An isolated Bell’s palsy, with a chronic meningitis presentation, could be what in a child (or adult)?  
Lyme meningitis

What are the most likely causes of aseptic meningitis?  
Enterovirus + arboviruses (enterovirus is most common on the exam)

The medical portion of treating a brain abscess is likely to include what two antibiotics?  
Ceftriaxone & Metronidazole (Flagyl®)

What is the most cost-effective way to evaluate a patient for an invasive diarrhea?  
Send stool for fecal WBCs  
(*popular test item!*)

Thanksgiving, chitlins, and chitterlings, are all associated with what gut infection on the boards?  
*Yersinia enterocolitica* (pseudoappendicitis presentation)  
(*popular test item!*)

When is it not alright to give your patient antimotility drugs for diarrhea?  
If you suspect invasive diarrheal illness
Which bacterial causes of diarrhea frequently cause fecal WBCs (invasive disease)?

(3)

- Shigella
- Salmonella
- Campylobacter jejuni

Is it alright to treat Salmonella with antibiotics?

Generally, no – greatly increases the chances of becoming a carrier

Which patients are definitely supposed to be treated with antibiotics for Salmonella infection?

- The severely immuno-compromised
- Children <2 months old
- Sickle cell patients

Why is it reasonable to treat certain patient groups for Salmonella diarrhea?

High risk of bacteremia

If a rabbit bite becomes infected, what is the most likely organism?

Pasteurella multocida

(Tularemia is also theoretically possible, but then there will be a prominent lymph node)

If someone were to get an infection from a pet hamster, what would it be?

“Lymphocytic choriomeningitis”

(popular test item!)

Would that same hamster be a risk to a fetus growing in the same household?

Yes – The organism is a virus known to cause hydrocephalus, mental retardation, and chorioretinitis with in utero exposure

What is the reservoir for lymphocytic choriomeningitis?

House mice, but it is often transmitted to other wild or domestic rodents

How is lymphocytic choriomeningitis treated?

Supportive care only

(ribavirin may be helpful, but there is no proven treatment)

How is this rodent-related disease transmitted?

Any bodily material from an infected rodent contacting a break in the skin or with inhalation
| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| Name some infections you can catch from your pet ferret? (3)             | 1. TB  |
|                                                                         | 2. Influenza |
|                                                                         | 3. Campylobacter |
| (Roughly 1 in 5 ferrets have Campylobacter!!)                            |        |
| What causes Q fever?                                                     | Coxiella burnetii |
| (popular test item!)                                                     |        |
| Where is Coxiella burnetii (Q fever) most common in the USA?             | California |
| (popular test item!)                                                     |        |
| Which animals are the most likely sources for Q fever? (popular test item!) | Cats & Livestock |
| Biggest concentration of organisms are in the placenta when the animal gives birth |
| How can you remember the unusual source for some cases of Q fever?       | Think of standing in a “queue” to give birth – this reminds you of the placenta |
| In addition to finding Q fever in placentas, where else do people (especially in vignettes) contract Q fever? (popular test item!) | Wool & hides – it survives in tick feces for a year |
| On micro, a buzzword for Coxiella burnetii is that it is a/an _______ pathogen? | Intracellular |
| In case you don’t remember, due to the astonishingly small number of cases you likely see, what are the symptoms/signs of Q fever? | Mainly flu-like illness + diarrhea +/- pneumonia |
| When in doubt about the treatment for an unusual disorder on the peds boards, what should your top two choices be? (Known question of interest) | 1. Tetracycline/doxy-cycline (≥9 years old) |
|                                                                         | 2. TMP/SMX (Ciprofloxacin in adults) |
| What is the treatment for Q fever?                                       | Tetracycline |
| Question                                                                 | Answer |
|-------------------------------------------------------------------------|--------|
| How do you make the diagnosis of Q fever?                               | Serology |
| When in doubt, if you are asked how to make a diagnosis on a weird disorder, what should you answer? | Serology |
| How do you diagnose and treat *Chlamydia psittaci*?                      | • Serology  
• Tetracycline/doxycycline |
| A child whose family owns a pet store presents with (mild) tachypnea, cough, & some splenomegaly. You diagnose a pneumonia. Which organism caused it? | *Chlamydia psittaci*  
(Diagnose by serology, treat with tetracycline or doxycycline) |
| How exactly do people contract *Chlamydia psittaci*?                     | Inhaling dried bird excreta  
(The birds don’t have to be ill appearing) |
| At a family reunion, most family members come down with a flu-like illness, diarrhea, and some have respiratory symptoms. The family has been eating together, of course, and has also been playing with some kittens that were born during the family gathering. What organism is causing this outbreak? | *Coxiella burnetii*  
(Q fever)  
(the family was exposed to the placenta when the kittens were born) |
| Why is Augmentin® (Amoxicillin/clavulanate) used for animal bites?        | Because *P. multocida*, the most common pathogen, often has B-lactamase |
| What dermatologic condition do humans usually acquire from cats?        | Ringworm (microsporum canis) |
| Why would a boards vignette mention that an animal attack (big or small) was “unprovoked”? | Because they want you to give rabies prophylaxis |

(popular test item!)
Is a vignette that features a cat bite likely to be about rabies, on the boards?

No – Rabies vignettes usually have dog bites, or wild animal contact (cats can carry it, though)

A patient presents with pneumonia and splenomegaly. The vignette mentions birds. What is the organism?

Chlamydia psittaci (Dx: Serology) (Tx: tetracycline/doxy)

If a dog has been fully immunized, then it is immunized against leptospirosis infection. Could a fully immunized dog still give a human leptospirosis?

Yes – Spirochetes can still be excreted in the urine of an immune animal

How does leptospirosis usually present?

Jaundice (no liver necrosis, just dysfunction)

How is leptospirosis diagnosed (let’s review)?

1st week of infection – Blood culture
Later – Urine culture (Tx: PCN or doxy)

Is feline immunodeficiency virus a threat to humans?

No

Is feline immunodeficiency virus a threat to severely immunocompromised humans?

No

If your cat gets Giardia, are humans in the household at risk to develop it?

No – Not even with immunocompromise (Imagine a cat with Giardia!)

What is the best way to diagnose a new toxoplasmosis infection?

IgM
When during pregnancy is a fetus most likely to become toxoplasmosis infected, if mom catches the infection?

(popular test item!)

Fetal infection with toxoplasmosis is most likely to have the most severe effects on the fetus when it happens during what part of gestation?

(popular test item!)

Very high eosinophilia and IgG, with a “migratory pneumonia,” suggests what possible parasitic infection?

(popular test item!)

A vignette tells you that a child has a history of pica. The child is now febrile, wheezing, and has developed hepatomegaly. What is the causative organism?

(popular test item!)

Other than clinically, how do you make the diagnosis of Toxocara canis or cati infection?

ELISA

What is the natural course for toxocara infection?

The worms are in the wrong host, so they die

(spontaneous resolution)

Why would the boards tell you that a child with toxocara has a history of pica?

That’s how the child picked up the eggs

Which tapeworm in the really long type?

Pork tapeworm – 4–9 feet!!

Do tapeworms cause problems for humans?

Other than “anal pruritis,” not really
| Question                                                                 | Answer                                                                                       |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| How do humans get the short tapeworms? – the kind that infect dogs & cats? | From dog/cat fleas                                                                           |
| A child from the southern USA is presented on your boards. He has a single coin-shaped or small disc lesion in one of his lungs. What is the lesion, and how should it be treated? | • Dog heartworm (Dirofilaria immitis)  
• No treatment needed (wrong host)                                                              |
| (popular test item!)                                                     |                                               |
| Does infection with heartworm produce any symptoms in humans?            | No – just the “coin lesion” on CXR, sometimes                                                 |
| (popular test item!)                                                     |                                               |
| How do humans contract heartworm?                                       | Mosquito bites                                                                               |
| (popular test item!)                                                     |                                               |
| What proportion of people infected with West Nile virus develops any clinical symptoms? | 1 in 5                                                                                       |
| (popular test item!)                                                     |                                               |
| If a patient develops clinical symptoms of West Nile virus, what are the two possible presentations? | 1. Mild flu-like illness (most patients)  
2. Encephalitis – Hallmark is encephalitis with floppy muscles/low tone |
| (popular test item!)                                                     |                                               |
| How do you make the diagnosis of West Nile virus?                        | Serum IgM                                                                                    |
|                                                                         | Or Viral ID from CSF (RT-PCR test for viral RNA)                                              |
| An adolescent is presented on your boards. The child is from England, and presents with ataxia and cognitive degeneration. What is the disorder? | Mad Cow Disease – when it affects a person it is called “variant Creutzfeldt-Jakob disease” |
| (popular test item!)                                                     |                                               |
| What is bovine spongiform encephalopathy?                               | Mad Cow disease                                                                             |
|                                                                         |                                               |
In addition to ataxia, are other motor changes seen with variant CJD?  
Yes – Chorea or myoclonus

(popular test item!)

What is the characteristic appearance of the brain in new variant CJD?  
1. “Florid” plaques (a lot of plaques)  
2. Spongy changes

(popular test item!)

Is the presentation and diagnostic data exactly the same in Creutzfeldt-Jakob and new variant CJD?  
No – The EEG changes are different & presentation tends to be more psychiatric in variant CJD (otherwise they are very much the same)

Have there been cases of variant CJD in the US?  
Yes – about 10 – But all are thought to have caught the disease in England/Great Britain or other areas with bovine spongiform encephalopathy outbreaks

Strep pyogenes belongs to which Strep group?  
Group A

(popular test item!)

What is the drug of choice for Strep infection?  
PCN or Amoxicillin always – there is no resistance

(popular test item!)

If allergy is an issue, what is an alternative regimen for treating Strep pyogenes?  
Erythromycin  
(or clarithromycin, other macrolides)

(popular test item!)

If you need to treat a penicillinase resistant organism, what IV “cillin” could you use?  
Oxacillin/nafcillin  
(Remember, the issue is penicillinase, not methicillin resistance – vanc is not the answer)
If you are dealing with a β-lactamase resistant organism, what other IV drugs in the PCN family can you still use?

(popular test item!)

What are sulbactam, clavulanate, and tazobactam?

(popular test item!)

What oral penicillin can be used to fight β-lactamase producing organisms?

(popular test item!)

Do all three of the IV PCNs with β-lactamase inhibitors work against pseudomonas?

(popular test item!)

Which oral PCN is effective against pseudomonas?

(popular test item!)

What are the main infections that amoxicillin/clavulanate (Augmentin) is good for?

(3)

(popular test item!)

The drug of choice for tularemia is streptomycin, but it is only available in IV form. If your tularemia patient is not sick enough to need IV therapy, what should you use? (Remember, it falls into the weird infections category)

(popular test item!)

What is the treatment for Q fever?

(popular test item!)
What is the treatment for Ehrlichiosis?  
Doxycycline  
(popular test item!)

What is the treatment for Rocky Mountain spotted fever?  
Doxycycline  
(chloramphenicol can also be used, if tetracyclines are not available)  
(popular test item!)

Ampicillin is the drug of choice for which two somewhat unusual organisms?  
Listeria  
+  
Enterococcus (if it is sensitive)  
(popular test item!)

A UTI in a 5-year-old is most likely due to what organism?  
E. coli  
(Treat with: TMP/SMX)  
(popular test item!)

If an 18-year-old presents with a UTI, how would you treat him or her?  
TMP/SMX  
Or  
Ciprofloxacin  
(other choices include nitrofurantoin)  
(popular test item!)

If a 1-month-old presents with a UTI, which organisms are you worried about?  
E. coli  
Grp B strep  
Listeria  
(3)  
(popular test item!)

How will you need to treat a 1-month-old with a UTI, initially?  
Ampicillin (for Listeria)  
+  
Gentamicin or a 3rd-generation cephalosporin  
(popular test item!)

Does ceftriaxone cover pseudomonas?  
No!  
(popular test item!)

A patient is presented who has recently received an antibiotic. History states that the creatinine clearance is impaired. The patient just had a seizure. What are they trying to tell you?  
Reduced creatinine clearance + seizure on antibiotic = imipenem  
(popular test item!)
Which antibiotic should we avoid in the very young due to the (largely theoretical) possibility of biliary sludging?  
**Ceftriaxone**  
(cefotaxime can be substituted)

A child goes swimming in a cow pond and develops amebic meningitis. What is the organism?  
**Nigleria**

If you need to treat a *Bordetella pertussis* infection, what is your drug of choice?  
**Azithromycin**

What must you always remember about using erythromycin estolate?  
**Don’t use it in pregnancy**

What is the best & cheapest antibiotic in the aminopenicillin family to treat Enterococcus?  
**Ampicillin**  
(ignore the “amino” part of aminopenicillin)

If Enterococcus creates a bad or severe infection, but it’s ampicillin sensitive, what should you do for treatment?  
**Treat with ampicillin & gentamicin for synergy**

If Enterococcus is resistant to ampicillin, what should your first antibiotic choice be?  
**Vancomycin**

For resistant Enterococcus causing UTI, which medication is often effective?  
**Nitrofurantoin!**  
(avoid using a higher level antibiotic! 😊)

Which infections can still be treated with PCN G or PCN VK?  
(**popular test item!**)

- Leptospirosis
- Meningococcus (some cases)
- Syphilis
- Grp A, and often B, Strep infections in the mouth (developing resistance)
If an IV drug user develops endocarditis, how should you empirically treat it?

(3 General Infectious Disease Question and Answer Items)

Vancomycin (MRSA)

+ Gentamicin (synergy + Pseudomonas)

Tobramycin is not really the drug of choice for any infection, except in which category of patients?

(3 General Infectious Disease Question and Answer Items)

CF patients

(3 General Infectious Disease Question and Answer Items)

Tobramycin is not really the drug of choice for any infection, except in which category of patients?

(3 General Infectious Disease Question and Answer Items)

CF patients

(3 General Infectious Disease Question and Answer Items)

You are worried about possible Pseudomonas infection in a CF patient. You have just started the patient on ceftriaxone for another infection. Will it cover the Pseudomonas?

(3 General Infectious Disease Question and Answer Items)

No!

A patient on vancomycin develops worsening renal function. Should you consider the vancomycin as a possible cause?

Yes

If your vancomycin patient turns red shortly after you begin infusing vancomycin, what should you conclude?

It’s “red man syndrome” not allergy – (the whole patient turns red due to histamine dumping by most cells)

Under what conditions will you see “red man syndrome?”

(3 General Infectious Disease Question and Answer Items)

Rapid infusion of vancomycin

(Slow it down! It’s not dangerous, just annoying)

Which ID medications most often cause renal toxicity?

Gentamicin

+ Amphotericin B

Is it alright to treat a neutrotropic patient with fever with a single drug, if the patient doesn’t appear to be particularly ill?

Yes – if the drug covers pseudomonas
If a febrile, neutropenic, ill-appearing patient has Gram-negative organisms in the blood, what is the appropriate antibiotic coverage for that patient?

Two drug therapy –
One to cover pseudomonas and other infections

+ One aminoglycoside for synergy
(e.g. imipenem + an aminoglycoside, or Timentin® + gentamicin, & sometimes other regimens depending on institution, such as a meropenem with fluoroquinolone)

Which macrolide is associated with transient hearing loss?

Erythromycin

Which antibiotics target the 50s subunit of bacterial ribosomes?

Macrolides & oxazolidinones

Lyme disease is usually treated with fairly simple antibiotics such as amoxicillin. If the Lyme disease is very severe, which antibiotic should be used?

Ceftriaxone

If tobramycin is in the answer choices, you should check the question again, to see whether the patient has what disorder?

CF

Which oral macrolide has a very long half-life?

Azithromycin

If a patient has both pneumonia and a brain abscess, what is the organism?

Nocardia (or occasionally TB)

If a patient has both pneumonia and a brain abscess, what antibiotic will treat the most likely organism?

TMP/SMX (Nocardia)
If you are treating a C. diff infection with vancomycin, what must you remember?

(popular test item!)

Vanc will only work if given **orally** (Metronidazole works both ways)

Leptospirosis is usually treated with PCN. What other antibiotic is also effective?

Doxycycline/Tetracycline

(of course – it’s a “weird infection”)

When in doubt, which antibiotic group is most likely to be the cause of ear or kidney damage?

(popular test item!)

Aminoglycosides

What is the “post-antibiotic effect” seen in Gram-negative bacteria?

Gram-negative bacteria die or stop growing even when antibiotic levels drop **below** the MIC (Mean Inhibitory Concentration)

Why is the “post-antibiotic effect” important?

Allows once daily dosing of drugs such as aminoglycosides → less renal toxicity

What is a cheap, but good, osteomyelitis treatment? (actually, give the top three!)

1. Oxacillin
2. Cefazolin (Ancef®)
3. Clindamycin

Will ceftriaxone cover Enterococcus?

No (Ampicillin does)

Can ceftriaxone be used to cover meningococcus?

Yes

Can ceftriaxone cover Listeria?

No – Ampicillin does!

If Staph aureus is methicillin resistant, will ceftriaxone cover it alright?

No – Vancomycin does

Is it alright to mix ketoconazole and H2 blockers?

No – Ketoconazole is only absorbed in an acidic environment
Which medication has coverage very much like an aminoglycoside, plus good Gram-positive coverage, and no renal toxicity?

Aztreonam

Which has better absorption and distribution, PO or IV quinolones?

Equivalent (unless the gut is messed up)

Which special pediatric population with a genetic disorder will need IV quinolones?

CF patients (gut issues)

If a question involves ketoconazole, what is the question likely to be about?

A drug interaction

(popular test item!)

Is it alright to use ciprofloxacin for a patient already taking theophylline?

No – the cipro will increase the theophylline level → toxicity

Does cipro provide good coverage for pneumonia?

No – levofloxacin or gatifloxacin do (cipro resistance & Gram-positive coverage is a problem)

You recently started a child on an antibiotic while arranging for a surgeon to evaluate him for appendicitis. The surgeon removed the appendix. Now the boy presents with postsurgical bleeding. What is the problem?

(popular test item!)

Certain antibiotics impair “recycling” of vitamin K, which can lead to bleeding. (Cefotetan is the most common one)

Antibiotics that impair recycling of vitamin K are most likely to cause bleeding in which patient population?

Those who are already vitamin K deficient

What antibiotic is most likely to cause impaired vitamin K recycling?

Cefotetan

(popular test item!)
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| If a patient has a history of a life-threatening anaphylaxis to PCN, is it alright to give a cephalosporin? | No – the risk is too big if a reaction does occur                       |
| What is the probability of a patient reacting to a cephalosporin, if he or she has a PCN allergy?        | 2.5% is the allergy is “confirmed” (1% if it is a patient reported allergy only) |
| If a patient has a remote history of an allergic reaction to PCN (such as rash), is it alright to give a cephalosporin on the boards? | Yes (They want you to know both when it is alright, and when you should not take a chance) |
| Which cephalosporins have essentially no cross-reactivity with penicillins? | 3rd & 4th generation                                                   |
| Which cephalosporins are most likely to cross-react with which penicillins? | Amoxicillin or ampicillin allergy may cross-react with: 1st- & 2nd-generation cephalosporins (has to do with an R-1 side chain the molecules have in common – not with the beta lactam ring) |
| Can cat scratch disease also be contracted from a cat bite? | Yes (but not as common)                                                |
| How do humans contract the short (only a few inches) type of tapeworm? | By ingesting infected dog or cat fleas (same way your dog gets them!) |
| Dirofilaria, commonly known as heartworm, causes “coin lesions” in human lungs. How is it contracted? | Mosquitoes!                                                            |
| What are Osler nodes and what do they indicate? | • Painful nodules on palms & soles • Subacute bacterial endocarditis |
| For visceral larva migrans, when should you consider treatment? | Severe or prolonged symptoms                                           |
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| What is the treatment for visceral larva migrans?                       | Albendazole                                                            |
| What types of microbes are present in septic abortion?                 | Polymicrobial – including anaerobes                                      |
| What significant risks exist for women using the contraceptive sponge?  | 1. Dislodgement – so it won’t work                                      |
|                                                                        | 2. Toxic shock syndrome – if left in place too long                     |
| Do spermicides lessen or increase risk of acquiring an STD?            | A matter of controversy – it appears that they increase risk of contracting certain disorders and that is the likely boards answer |
|                                                                        | (75% effective as contraception, when used alone)                       |
| Strawberry cervix (little punctuate hemorrhages) and gray-yellow frothy discharge = what diagnosis? | Trichomonas                                                            |
|                                                                        | (Treatment: metronidazole or clindamycin)                               |
| Slides of your patient’s vaginal discharge show something swimming. What is the diagnosis? | Trichomonas                                                            |
| Fishy odor and “clue cells” = what diagnosis?                          | Gardnerella aka bacterial vaginosis                                     |
|                                                                        | (Treatment: metronidazole or clindamycin)                               |
| Do Trichomonas infections require partner treatment to eradicate the infection? | Yes                                                                    |
| Is bacterial vaginosis always an STD?                                  | No, but it can be                                                      |
| How do you treat Trichomonas + gardnerella/bacterial vaginosis?        | Metronidazole or Clindamycin                                            |
| Is it okay to use metronidazole in pregnancy?                          | Not on the boards                                                      |
|                                                                        | (ob/gyns sometimes do in early pregnancy though)                       |
Which type of HSV typically affects the genital region? HSV-2

What are some good techniques for identification of herpes infection? (4)
1. Herpes culture (gold standard)
2. Tzanck test
3. IgG
4. PCR is used with CSF

What is the classic presentation of herpes lesions? Multiple vesicles (or shallow or crusted erosions), painful and/or itchy

What positive effects will antiviral therapies have on HSV? 1. Shortened episodes
2. Fewer recurrences

For patients with severe or disseminated HSV infection, what should you do? IV Acyclovir 5–10 mg/kg Q8 hours

Which organism causes syphilis? Treponema pallidum (a spirochete)

What is the natural course of untreated syphilis? 3 phases:
1 – Single painless skin lesion aka chancre
2 – Rash, especially on palms & soles – darkened macules
3 – Cardiac, ocular, & CNS problems

How is syphilis treated? PCN

If a pregnant syphilis patient is PCN allergic, what should you use to treat her? PCN – you will need to desensitize the patient
Or Azithromycin (single dose) may be used, but resistance exists, efficacy is lower, & this treatment is not universally accepted (also not by the CDC)

If a syphilis patient does not have any symptoms and the chancre has healed, is s/he likely to be infections? Yes – at least in the first year after infection
How is the syphilis diagnosis made?

1. RPR or VDRL screening test
2. Confirm with treponemal test

If a patient has been treated for syphilis, will the blood tests for syphilis go back to normal?

Depends – the screening tests usually do, the treponemal tests usually don’t

If a nonpregnant patient is PCN allergic, what other med can you use to treat the spirochete?

Doxycycline or Tetracycline
(Ceftriaxone is sometimes used, but is less effective & requires 14 days of treatment – not recommended by CDC)

What kind of PCN, specifically, is used to treat syphilis?

Benzathine PCN 2.4 million units IM×1

If a patient seems to have late-stage or long-term syphilis, what change in the treatment regimen will be needed?

IM PCN every week for 3 weeks

Because some patients fail to respond to PCN treatment of syphilis, what response parameter must be monitored?

Either VDRL or RPR (but you must follow one of them consistently)

What kind of titer response indicates success in treating syphilis?

A 4× drop in VDRL or RPR level

What kind of titer response indicates failure in treating syphilis?

A 4× rise in VDRL or RPR level

Does neurosyphilis only occur with tertiary syphilis?

No – it can actually occur at any point in the disease

How is neurosyphilis treated?

IV PCN for 14 days

If a neurosyphilis patient is PCN allergic, what treatment regimen is usually recommended?

Desensitization then PCN
(ceftriaxone is a possible alternative)

How is neurosyphilis officially diagnosed?

CSF VDRL + treponemal tests + clinical signs

(3 components)
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| What are the clinical signs of neurosyphilis?                          | (4 groups)                                                            |
| - Meningitis                                                           |                                                                         |
| - Cranial nerve palsies                                                |                                                                         |
| - Cognitive, motor & sensory deficits                                  |                                                                         |
| - Eye + ear problems                                                   |                                                                         |
| Syphilis often causes what two ophthalmologic problems?                | Iritis and uveitis                                                    |
| **A classic boards presentation for neurosyphilis is a young person with** | **Hearing loss**                                                      |
| ____________?                                                           |                                                                         |
| What unusual reaction sometimes occurs with first-time treatment of syphilis? | Jarisch-Herxheimer (myalgias, fever, chills, back pain)                 |
|                                                                         | (especially common in pregnant patients)                               |
| **A young adult/adolescent presents complaining of eye pain and decreased acuity, bilaterally, with no history of trauma. What diagnosis should you consider?** | **Uveitis – possibly due to syphilis**                                |
| Both of the STDs with “granuloma” in the name require 21 days of treatment. What are the two disorders? |                                                                         |
| - Granuloma inguinale (aka Donovanosis – rare in the US)              |                                                                         |
| - Lymphogranuloma venerum (a special Chlamydia trachomatis infection) |                                                                         |
| How does Donovanosis (granuloma inguinale) present?                   |                                                                         |
| (2 important aspects)                                                  |                                                                         |
| - Painless but *progressive* ulcer                                     |                                                                         |
| - *No LAD*                                                             |                                                                         |
| How is granuloma inguinale usually treated?                           | Doxycycline or TMP/SMX for 3 weeks (21 days)                           |
|                                                                         | (*longer treatment may be needed if the ulcer or symptoms have not yet resolved – relapses occur up to 18 months after treatment!* ) |
| What is an alternative treatment regimen for granuloma inguinale, in case of allergy or pregnancy? | Macrolides (erythromycin or azithromycin)                              |
When treating STDs, we often do not do a follow-up culture to prove the cure. Is it necessary to do the follow-up culture if the patient is pregnant?  

Yes

Particular types of a common bacterium cause LGV (Lymphogranuloma venerum). What are the types? What is the bacterium?

Serovars (types) L1, L2 and L3 of Chlamydia trachomatis  
(the “L” types cause Lymphogranuloma)

LGV is uncommon in industrialized nations – why is it important to know about?  

(2 reasons)

- It is increasing in industrialized countries
- Failure to treat leads to disfigurement of the genitalia! (& sometimes lymphatic obstruction)
- Failure to treat leads to long term proctocolitis years later!

In which population is LGV especially common?

Men having sex with men

How does LGV present?

A genital ulcer that heals spontaneously and rapidly, then painful unilateral LAD  
(The ulcer is often gone before they seek treatment)

How is LGV diagnosed?

Serology

What will get rid of LGV?

21 days of doxycycline or erythromycin

Why is erythromycin estolate contraindicated in pregnancy?

Increased chance of hepatotoxicity

Which STD creates an expanding ulcer that bleeds very easily (“friable surface”)?  

Donovanosis aka granuloma inguinale  
Mnemonic: Use the DIG (Donovanosis Inguinale granuloma) initials to help you remember which one is Donovanosis. DIGgin’ a really big ulcer that bleeds

What are the symptoms of urethritis?

Dysuria + urethral discharge
| Question                                                                 | Answer                                                                                      |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| What is the most common cause of “non-gonococcal urethritis?”?         | Chlamydia                                                                                 |
| Is it common to have asymptomatic urethritis?                          | Yes                                                                                        |
| What is the simplest & cheapest way to screen for urethritis?          | Check urine for WBCs – >5/hpf is sensitive and specific for urethritis in males             |
| What is the usual treatment regimen for urethritis/cervicitis?         | Azithromycin 1 g or doxycycline 100 mg BID×7 days + Ceftriaxone (250 mg once)                |
| Alternative antibiotic regimens, suitable for pregnant (or allergic) patients with STD cervicitis are __________? | Erythromycin (500 mg QID×7 days) or Amoxicillin (500 mg TID×7 days) + Ceftriaxone for GC |
| Otherwise asymptomatic women with cervicitis will sometimes have what symptom after intercourse? | Spotting (of blood)                                                                         |
| If a pregnant woman requires treatment for gonorrhea, but she is allergic to cephalo-sporins, how can you treat her? | Azithromycin 2 g in a single dose (often produces GI distress)                               |
| Is it alright to use quinolones to treat STDs?                        | No, due to resistance                                                                       |
| How is “non-gonococcal urethritis” diagnosed?                         | If the discharge does not have gram-negative intracellular diplococci, it’s called “non-gonococcal” |
| What recent resistance pattern is developing for *N. gonorrhoea*?      | Cephalosporin resistance – The recommended dose has been doubled by the CDC! (in 2012 – from 125 to 250 mg IM) |
| If a patient develops gonorrheal pharyngitis, how would you treat it?  | Same as cervicitis                                                                         |
A patient presents with mucopurulent cervicitis and knee pain. She is running a low grade temp. What’s the diagnosis?

Gonorrhea (disseminated) with septic arthritis

How is disseminated gonorrheal infection treated?

IV ceftriaxone initially, then PO treatment for at least 1 week (duration depends on problem)

(other cephalosporin regimens are also approved)

How does disseminated gonococcus usually present?

1. Skin lesions
2. Right upper quadrant pain (Fitz-Hugh-Curtis Syndrome)
3. Arthritis

Which two vaginal infections raise the pH significantly?

(to >4.5)

Trichomonas &

Bacterial vaginosis

“Fishy smell” and copious discharge go with which vaginal infection?

Bacterial vaginosis

(sometimes KOH is added to get the fishy odor – usually not necessary)

Sometimes the discharge is not described as “fishy” smelling but rather ________?

“Amine” smelling (bacterial vaginosis)

Recent research shows that treatment of the male partners in cases of bacterial vaginosis is ________?

Not indicated

(this is a change!)

If a pregnant woman has bacterial vaginosis, is her pregnancy at risk in any way?

Yes – Increased risk of preterm labor, PROM, chorioamnionitis

If a pregnant woman develops bacterial vaginosis, how should you treat her?

Clindamycin PO –

The cream version actually increases chance of premature birth

(metronidazole is also a possibility but less desirable in pregnancy)
| Question | Answer |
|----------|--------|
| **How should you treat pregnant women with Trichomonas infections?** | Metronidazole 2 g × one is recommended (even in pregnancy)  
(tinidazole is also good for nonpregnant patients) |
| **If you prescribe metronidazole (or other drugs in this class) to an adolescent patient, what do you need to remember to tell the patient?** | Drinking alcohol will make them feel very bad!  
(Disulfiram-like reaction) |
| **A pregnant patient develops a yeast infection. What is the recommended treatment?** | One of the azole creams × 7 days |
| **Frequent candidal vaginitis is a red flag for ______?** | HIV infection or diabetes  
*although of course lots of patients with normal immune systems also have this problem* |
| **What constitutes a treatment failure for outpatient management of PID?** | 72 hours without clinical improvement |
| **What is the most accepted treatment regimen for Trichomonas?** | Metronidazole 500 mg BID × 7 days  
(vaginal topical treatment is NOT acceptable due to <50% cure rate & failure to treat the multiple sites involved!) |
| **If a sexually active woman presents with abdominal pain, but has no abnormal cervical discharge or WBCs on wet prep, what is the likelihood of PID?** | Very low |
| **What are two typical regimens for inpatient PID treatment?** | Cefoxitin + doxycycline  
Or  
Clindamycin + gentamicin  
*After 24 h of IV therapy with good response, it’s okay to change to PO doxy for 14 days* |
What is the typical outpatient regimen in pediatrics for PID?

One dose 3rd-generation cephalosporin +

Doxycycline × 14 days
+/- Metronidazole × 14 days

*(metronidazole is for vaginitis, or if there is a recent history of instrumentation)*

How is treatment different if a tuboovarian abscess is also present?

More Gram-negative coverage is needed — Add clindamycin or metronidazole to the regimen

How is the presentation of epididymitis different from that of urethritis?

Epididymitis causes testicular pain/swelling/tenderness

What will symptomatically improve epididymitis?

Pain meds
Scrotal elevation/support
Bed rest

Epididymitis in an adolescent should be treated how?

(Ceftriaxone 250 mg IM +
Doxycycline × 10 days)

What types of HPV cause most visible genital warts?

6 & 11

(Recurrent types)

Which types of HPV are most associated with the later development of cervical cancer and squamous intraepithelial neoplasia (also affecting males)?

16, 18, 31, 33, and 35

(Recurrent types)

What are the main treatment modalities for genital warts that can be applied by the patient him or herself?

Podofilox/podophyllin
Sinecatechins *(a green tea extract!)*
Or
Imiquimod

What are the main treatment modalities for genital warts that can only be applied by a medical provider?

- Cryotherapy
- Acids (TCA or BCA-types of acetic acid)
- Podophyllin resin
Which therapies for genital warts cannot be used during pregnancy? (1 group & 2 specific meds)

• The patient applied types, regardless of who applies them
• Interferon & 5-FU

What complication are infants of women infected with genital wart viruses at risk for?

Laryngeal condyloma (the virus likes mucosal surfaces, and grows on the larynx, as well)

Is vaginal delivery alright if visible genital warts are present?

Yes – Unless they directly obstruct delivery

How is genital HPV infection transmitted from mother to infant?

Unknown

Does elective c-section delivery prevent development of laryngeal lesions in the infant?

No

In what percentage of cases of laryngeal papillomatosis due to HPV does the mother have a history of genital HPV?

Just 60 %

Is laryngeal papillomatosis a common problem in at-risk infants?

No – Only about 2,000 cases per year in the US, despite relatively high HPV infection prevalence

(lesions may develop over first 5 years of child’s life)

If you diagnose a subclinical HPV infection, what should you do about it?

Nothing (unless there are squamous intra-epithelial lesons, in which case you follow the usual rules)

If an adolescent is exposed to someone with hepatitis A through sexual contact, what should you do?

Give vaccine or IG (within 2 weeks of exposure – long window for efficacy!)

As post-exposure prophylaxis for hepatitis A, which treatment is preferred?

Vaccine, unless – Child <1 year old
Immuneocompromise
Liver compromise
Or vaccine allergy
| Question                                                                 | Answer                                                                 |
|------------------------------------------------------------------------|------------------------------------------------------------------------|
| If a case of hepatitis A occurs, which unimmunized persons are considered to be at risk & require prophylaxis? | Household contacts, sexual partners, & illicit drug use partners |
|                                                                        | Those with “regular” contact, such as babysitters                        |
|                                                                        | ALL workers & children at daycare, if children are in diapers           |
|                                                                        | Classroom contacts only if children are not in diapers                   |
| If a non-immune patient is exposed to someone with hepatitis B through sexual contact, what should you do? | Give vaccine and IG (different sites, please)                            |
| If a patient is exposed to someone with Hepatitis C virus (HCV) through sexual contact, what should you do? | Monitor for seroconversion & hope for the best – IG doesn’t work & there is no vaccine |
| How should you monitor a patient for development of acute hepatitis C infection? | HCV RNA & liver panel – The RNA will turn positive significantly earlier than antibody tests! ("window period" in which infection is present but antibody is not yet measurable) |
| If monitoring for hepatitis C indicates that acute infection has begun, what is important to do? | Immediate referral to a specialist for possible early interferon treatment |
| Scabies is sometimes sexually transmitted. How is it treated?          | Permethrin cream (5 %) to whole body from neck down – leave on at least 8 h, then wash off |
| How does scabies present?                                              | Very itchy patient, with lines in finger/toe webs & clothing band areas |
| In order to prevent scabies re-infestation, what additional measures must your patients take? | • Treat other close contacts if they show signs of infection  
• Treat bedding/clothing |

**What organism causes scabies?**  
Sarcoptes scabiei  

**Mnemonic:**  
2nd word sounds like/looks like scabies
**Which organism causes pubic lice?**

**Pediculosis pubis**

How is pubic lice treated?

> Usually lindane or permethrin cream (1 %), just to affected areas

How should you treat a case of pubic lice in a pregnant patient?

> Permethrin 1 % cream (NO LINDANE)

Can eyelash lice be treated with permethrin or lindane shampoo/creams?

> No – Use topical ophthalmic “occlusive ointments” (in other words, petroleum jelly to suffocate ‘em!)

For treatment to be effective, patients with lice will also need to ______?

> Decontaminate bedding

Which patients are most likely to develop (infectious) proctitis?

> Those who engage in receptive anal intercourse

What are the symptoms of proctitis?

> Anorectal pain, discharge, and tenesmus

What are the usual pathogens in sexually acquired infectious proctitis?

> N. gonorrhoea
> C. trachomatis
> T. pallidum
> HSV

(LGV is also possible)

How is sexually transmitted proctitis treated?

> Same as urethritis – Ceftriaxone 250 mg +
> Doxycycline × 7 days
> (If HSV then acyclovir)
> (If syphilis then PCN)

How are the symptoms of proctocolitis different from those of proctitis?

> The colon is involved, so they have diarrhea and cramps

Are the organisms involved in proctocolitis the same as those involved in proctitis?

> No – They are typically invasive diarrheas like Entamoeba or Shigella

Can Giardia be an STD?

> Yes, in those who practice oral-anal sex

Which patient group is most often affected in hepatitis E outbreak?

> Young males (15–35 years old)
| Question                                                                 | Answer                                                                                   |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Where are patients most likely to encounter hepatitis E?               | In the developing world (also present in the USA, however)                                |
| Which patients are at risk for severe hepatitis E infections?          | Liver transplant patients & Pregnant women (20% mortality, worse in 2nd & 3rd trimesters) |
| How is hepatitis E mainly spread? (2 ways)                            | Fecal-oral via water supply & in undercooked pork or deer meat products                  |
| (one outbreak reported related to shellfish)                          | (20% mortality, worse in 2nd & 3rd trimesters)                                           |
| How serious is hepatitis E infection in children?                     | Usually mild & self-limited, like hepatitis A                                             |
| What is the usual course of hepatitis E infection in immunocompetent hosts, in general? | Self-limited                                                                             |
| Can hepatitis E infection become chronic?                              | Yes, in solid organ transplant patients – Otherwise no                                    |
| Diagnosis of hepatitis E depends on what two tests?                   | Hep E specific antibodies or HEV RNA                                                     |
| How long after exposure is your patient likely to develop hepatitis E? | 40 days!                                                                                 |
| (which means he or she is often back from their trip when they get sick!) | (which means he or she is often back from their trip when they get sick!)               |
| Is there any specific treatment for hepatitis E, or immunization?     | No – supportive care only & No vaccine in the USA (China has recently made one, but it is not yet approved) |
| Which hepatitis can only infect the liver if the patient is already infected by hepatitis B? | Hepatitis D (the D virus is incomplete – it can’t replicate & infant cells without using some of the B virus’s machinery) |
| Question                                                                 | Answer                                                                                                                                                                                                 |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Is there a vaccine for hepatitis D?                                    | No – but vaccinating against hepatitis B infection will also prevent hepatitis D infection                                                                                                                  |
| How serious is hepatitis D infection in an already hep B infected patient? | Serious – 5% fulminant liver failure 85% develop chronic hep D infection with increased chance of cirrhosis & hepatocellular carcinoma                                                                                           |
| What is the best management of hepatitis D, in a patient already infected with hepatitis B? | Monitor for signs of impending liver failure & need for transplant Interferon treatment for 1 year safe in children, but not very successful in clearing chronic infection                                               |
| What is the best management of hepatitis D in a patient coinfected with hepatitis B & D at the same time? | Supportive care & monitoring – Most patients will clear both infections successfully                                                                                                                                 |
| What is the difficulty with a positive serological test for Lyme disease? | It tells you whether the patient was exposed, but not whether she or he is currently infected (antibodies are present for a long time) & Antibody tests are often negative in early acute infection! |
| Which sign of Lyme disease means you should treat empirically, without further laboratory confirmation? | Erythema migrans (with reasonable risk of exposure to ticks)                                                                                                                                              |
| If your patient does not have an erythema migrans rash, but you still suspect Lyme disease, what should you do to confirm it? | 2-step process: ELISA or IFA, if positive Do Western blot Treat only if both are positive! (IFA = immunofluorescence assay)                                                                            |
| Does small pox occur naturally?                                        | No – it is completely eradicated. If you see it, it is bioterror (or a similar appearing related disorder)                                                                                                 |
| Question                                                                 | Answer                                                                                                                                 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| How is small pox treated?                                               | Supportive care only + quarantine to prevent spread                                                                                     |
| What limits immunization of the population against small pox? (we did it before . . .) | Significant cardiotoxicity occasionally occurs & Disseminated disease is more likely now due to prevalence of immunocompromise & certain skin disorders |
| How do small pox patients present?                                     | Ill appearing (severe flu-like illness), with diffuse blistering on mucous membranes & external skin Lesions are all in the same stage & diffusely present on the body |
| Is small pox uniformly fatal?                                          | No – Around 40 % overall (30 % for the most common type, 95 % for the two worst types but these develop in only about 5 % of the patients) |
| How easily does small pox spread? Will everyone in a crowd get it, if an infected person walks through? | Fairly easily, but it usually requires close face-to-face or bodily fluid contact Contact with contaminated items like bedding can spread the disease Only rarely spread via air in enclosed spaces Contagious small pox patients are also usually quite ill & not likely to be walking far! |
| What relatively common infectious diseases sometimes cause AV block?    | Viral myocarditis & Lyme disease (some zebras, too, such as Chagas disease) |
| Question                                                                 | Answer                                                                 |
|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| Does JIA (juvenile idiopathic arthritis) cause valvular heart disease?  | No – it can cause myocarditis/pericarditis                              |
| What are the most common & well-known infectious causes of myocarditis? | Coxsackie A & B viruses (especially Coxsackie B)                        |
|                                                                          | (Coxsackie viruses are enteroviruses)                                   |
| Recent PCR-based studies have shown that which two other viruses are    | HHV 6 (virus associated with roseola infantum)                          |
| currently very common causes of myocarditis?                            | &                                                                      |
|                                                                          | Parvovirus B19                                                         |
| Historically, which two viruses were thought to cause most myocarditis  | Adenoviruses                                                          |
| (& still do cause it regularly)?                                        | &                                                                      |
|                                                                          | EBV                                                                    |
| Is viral myocarditis, the most common type of myocarditis in children,  | No –                                                                   |
| a common problem?                                                       | For example, only about 2% of patients with enteroviral infection      |
|                                                                          | develop myocarditis                                                    |
| What physical findings are noted in myocarditis?                        | CHF findings, and no murmur                                            |
| If a myocarditis patient has pulsus paradoxus, what would that make you| Possible pericardial effusion (causing tamponade)                      |
| think?                                                                  |                                                                        |
| How do you document a diagnosis of viral myocarditis?                   | Viral serology & cultures                                              |
| What is the main goal of myocarditis treatment, in terms of cardiac     | Minimize hemodynamic demands to minimize cardiac tissue damage         |
| tissue?                                                                 |                                                                        |
| Which myocarditis patients require inpatient treatment?                 | Any with symptoms –                                                   |
|                                                                          | Decompensation can occur rapidly!                                     |
| Are blood-borne parasites known to cause myocarditis?                   | Yes –                                                                  |
|                                                                          | Lyme, Babesiosis, & Ehrlichiosis all can (not often, though)           |
Which two bacteria are most often involved in the uncommon *bacterial* myocarditis?

- Corynebacterium diphtheriae (diphtheria)
- Staph aureus

Are myocarditis cases always due to infectious causes?

No – Drugs, toxins, hypersensitivity and other reactions can cause it

How bleak is the prognosis in pediatric myocarditis?

It depends on the cause, but complete recovery may occur in up to 50% of cases