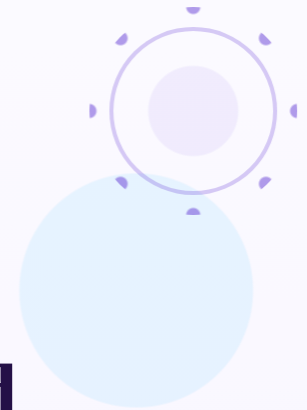
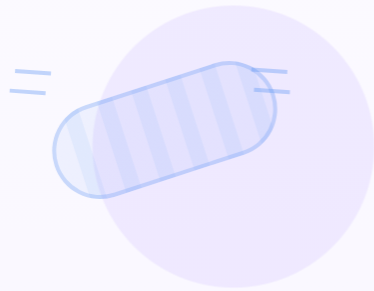




Top 25 High-Yield Microbiology Patterns for Step 1

BUGS • VIRUSES • FUNGI • PARASITES

Question-tested buzzwords, mechanisms, and traps you keep seeing.

How to use this guide: Start with How It's Tested. Those mini-stems are written to make you recognize common question setups. Then read What You Need to Memorize for the facts that get the question right, and Don't Miss for the common trap.

FREE STEP 1 STUDY SHEETS

Want more free high-yield resources from RxMnemonic? Tap below.

[Visit RxMnemonic.com](https://www.rxmnemonic.com)

Brought to you by RxMnemonic

Table of Contents

1. RNA Viral Syndromes	3	14. Viral Hepatitis: HBV, HCV & HDV	9
2. Streptococci & Enterococci	3	15. Listeria & Intracellular Bacteria	10
3. Opportunistic Fungi	4	16. Endemic Dimorphic Fungi	10
4. Pseudomonas & Nonenteric GNRs	4	17. Epstein-Barr & Cytomegalovirus	11
5. HIV	5	18. Bacterial Toxins & Virulence Factors	11
6. Staphylococci	5	19. Malaria & Babesiosis	12
7. Clostridia & Anaerobic Infections	6	20. Intestinal & Tissue Protozoa	12
8. Escherichia coli	6	21. Mycobacteria	13
9. Microbial Genetics & Resistance	7	22. Other DNA Viruses	13
10. Enteric Gram-Negatives	7	23. Arboviruses & Congenital Viral Infection	14
11. Spirochetes, Chlamydia & Mycoplasma	8	24. Toxoplasma & Neuroinvasive Parasites	14
12. HSV & Varicella-Zoster	8	25. Influenza Virus	15
13. Neisseria Species	9		

1. RNA Viral Syndromes

Tested Concept: enterovirus / respiratory viruses / fecal-oral viruses / rabies

How It's Tested

- ▶ An **infant** with winter wheezing and retractions question asks about RSV bronchiolitis; a barking cough with **inspiratory stridor** points you to parainfluenza croup.
- ▶ Lymphocytic CSF with normal glucose or an abrupt vomiting-diarrhea outbreak in a closed setting asks for norovirus.

What You Need to Memorize

- Enteroviruses are the leading cause of aseptic meningitis; coxsackie viruses cause myocarditis.
- Rhinovirus is a nonenveloped +ssRNA picornavirus; its purified genome is directly infectious.
- Rotavirus infects mature villous enterocytes → villous blunting; norovirus causes abrupt closed-setting outbreaks.
- HAV is fecal-oral and linked to shellfish; HEV is fecal-oral and causes **fulminant hepatitis** in pregnancy.

Don't Miss

- ★ Rabies PEP for an unvaccinated patient = wound care + immune globulin + inactivated vaccine; the virus enters peripheral nerves near the neuromuscular junction.

2. Streptococci & Enterococci

Tested Concept: encapsulation / hemolysis / postinfectious disease / endocarditis

How It's Tested

- ▶ A patient with **asplenia** or **sickle cell disease** develops lobar pneumonia, meningitis, or overwhelming sepsis from encapsulated pneumococcus.
- ▶ A neonate has sepsis from a CAMP-positive organism (*Strep agalact*), or a patient develops subacute endocarditis after **dental work** (*Viridans Strep*)

What You Need to Memorize

- *S. pneumoniae* is **lancet-shaped**, optochin sensitive, bile soluble, and has an **antiphagocytic capsule**.
- Group A Strep's M protein resists phagocytosis; pharyngitis can cause rheumatic fever, while pharyngitis or impetigo can precede PSGN.
- Group B Strep is CAMP positive and uses a sialic acid-rich capsule to evade complement and phagocytosis in neonates.
- Enterococcus is bile-esculin positive, grows in 6.5% NaCl, is gamma-hemolytic, and causes post-instrumentation UTI.

Don't Miss

- ★ *S. gallolyticus* bacteremia or endocarditis should trigger evaluation for colorectal neoplasia.

3. Opportunistic Fungi

Tested Concept: Candida / Aspergillus / Mucor / Cryptococcus / Pneumocystis

How It's Tested

- ▶ DKA with **black necrotic sinonasal tissue** points to mucormycosis; neutropenia with hemoptysis and acute-angle septate hyphae points to invasive Aspergillus.
- ▶ Advanced **HIV** with elevated opening pressure and encapsulated budding yeast suggests Cryptococcus; mucosal plaques or **central-line** fungemia suggest Candida.

What You Need to Memorize

- Aspergillus has septate acute-angle hyphae; ABPA causes asthma, eosinophilia, transient infiltrates, and central bronchiectasis.
- Mucor/Rhizopus has broad, nonseptate, right-angle-branching hyphae and requires biopsy of necrotic tissue.
- Cryptococcus has a **thick polysaccharide capsule**, stains with mucicarmine, and spreads from lungs to CNS.
- Candida forms budding yeast, pseudohyphae, and germ tubes; candidemia can hematogenously seed the eye.

Don't Miss

- ★ **Pneumocystis causes diffuse interstitial disease with silver-stained cysts and is treated with TMP-SMX.**

4. Pseudomonas & Nonenteric GNRs

Tested Concept: Pseudomonas / Legionella / H. influenzae / Bordetella

How It's Tested

- ▶ **Cystic fibrosis**, a burn wound, hot-tub folliculitis, or ecthyma gangrenosum asks for Pseudomonas.
- ▶ Water-system pneumonia with diarrhea, high fever, and **hyponatremia** points to Legionella; severe **epiglottitis** in an undervaccinated child points to Hib.

What You Need to Memorize

- Pseudomonas is motile, oxidase positive, non-lactose fermenting, and forms an alginate biofilm in cystic fibrosis.
- Legionella lives in artificial water systems, replicates intracellularly, and is controlled by Th1-mediated macrophage activation.
- H. influenzae requires factors X (hemin) and V (NAD⁺); the PRP capsule drives invasive Hib disease, while nontypeable strains cause mucosal disease.
- Bordetella causes paroxysmal cough, inspiratory whoop, and posttussive emesis; **tracheal cytotoxin** destroys ciliated epithelium.

Don't Miss

- ★ **Cat bite = Pasteurella; rabbit or tick exposure = Francisella; painful ragged genital ulcer = H. ducreyi.**

5. HIV

Tested Concept: acute infection / entry / reservoirs / testing / resistance

How It's Tested

- ▶ A heterophile-negative mononucleosis-like illness with generalized lymphadenopathy and cytopenias asks for HIV, not EBV.
- ▶ A patient from West Africa has a positive HIV antigen-antibody test, AIDS findings, and undetectable HIV-1 RNA, suggesting HIV-2.

What You Need to Memorize

- Screening detects p24 antigen plus antibody; RNA and p24 can be positive before antibodies during the window period.
- **gp120 binds CD4 plus CCR5/CXCR4; gp41 mediates fusion.** Macrophages are CD4+/CCR5+ reservoirs.
- Protease inhibitors prevent polyprotein cleavage, producing immature noninfectious virions.
- Intermittent ART selects resistant pol variants; combination therapy and adherence suppress resistance and reduce vertical transmission.

Don't Miss

- ★ Acute HIV can be antibody-negative; do not rule it out when RNA or p24 is already detectable.

6. Staphylococci

Tested Concept: *S. aureus* / toxins / endocarditis / prosthetic biofilm

How It's Tested

- ▶ Injection drug use with **tricuspid endocarditis** and septic pulmonary emboli, or severe post-influenza cavitary pneumonia, asks for *S. aureus*.
- ▶ Abrupt vomiting within **hours of a shared meal** asks for ingestion of preformed heat-stable staphylococcal enterotoxin.

What You Need to Memorize

- *S. aureus* colonizes the **anterior nares** and causes skin abscesses, bacteremia, endocarditis, and hematogenous osteomyelitis.
- Protein A binds the Fc portion of IgG; Panton-Valentine leukocidin is linked to necrotizing post-influenza pneumonia.
- *S. epidermidis* is coagulase negative and forms biofilms on **prosthetic devices** and intravascular catheters.
- *S. saprophyticus* is coagulase negative, novobiocin resistant, and **causes cystitis** in young sexually active women.

Don't Miss

- ★ Staphylococcal scalded skin syndrome is exfoliative-toxin cleavage of desmoglein 1, producing a superficial split.

7. Clostridia & Anaerobic Infections

Tested Concept: botulism / tetanus / *C. difficile* / myonecrosis / Actinomyces

How It's Tested

- ▶ **Canned food** with descending paralysis asks for botulism; wound spasms ask for tetanus.
- ▶ Antibiotic-associated diarrhea asks for *C. difficile*; **foul sputum** after aspiration points to oral anaerobes.

What You Need to Memorize

- Botulinum toxin cleaves SNAREs → no ACh release; tetanospasmin blocks GABA and glycine.
- *C. perfringens* alpha toxin is **lecithinase** → myonecrosis and hemolysis.
- *C. difficile* follows microbiome disruption; use contact precautions and **soap-and-water handwashing**.
- Actinomyces = branching anaerobe + **sulfur granules**; cervicofacial/IUD disease → penicillin.

Don't Miss

- ★ Botulism causes descending flaccid paralysis; tetanus causes spastic paralysis.

8. Escherichia coli

Tested Concept: UTI / neonatal meningitis / STEC / ETEC

How It's Tested

- ▶ Pregnancy, urinary obstruction, or instrumentation followed by fever, dysuria, and flank pain asks for ascending *E. coli* infection.
- ▶ Bloody diarrhea after undercooked beef followed by anemia, thrombocytopenia, and acute kidney injury asks for *E. Coli* associated HUS.

What You Need to Memorize

- Uropathogenic *E. coli* uses P fimbriae for ascending pyelonephritis and is the leading cause of UTI and bacterial prostatitis.
- The **K1** capsule resists phagocytosis and is a major virulence factor in **neonatal** *E. coli* meningitis.
- STEC Shiga-like toxin depurinates 28S rRNA → 60S inactivation, hemorrhagic colitis, and HUS.
- ETEC heat-labile or heat-stable enterotoxins cause watery noninvasive traveler's diarrhea.

Don't Miss

- ★ STEC causes bloody diarrhea and HUS; ETEC causes watery secretory diarrhea without invasion.

9. Microbial Genetics & Resistance

Tested Concept: horizontal transfer / operons / target modification / viral mixing

How It's Tested

- ▶ **Sex-pilus transfer** asks for conjugation; uptake of naked DNA asks for transformation.
- ▶ One strain's envelope transiently changing another genome's host range asks for phenotypic mixing.

What You Need to Memorize

- **Conjugation = plasmid transfer; transformation = naked DNA; transduction = bacteriophage.**
- Operator mutations prevent repressor binding.
- Beta-lactams bind PBPs/transpeptidases; altered PBPs reduce drug binding.
- Target mutation/modification includes DNA-gyrase mutation (for fluoroquinolones) and 16S-rRNA methylation (for drugs that affect ribosomes ex. aminoglycosides, tetracyclines, etc).

Don't Miss

- ★ **Phenotypic mixing changes only the current virion; progeny revert because the genome is unchanged.**

10. Enteric Gram-Negatives

Tested Concept: Salmonella / Shigella / Campylobacter / Vibrio

How It's Tested

- ▶ Undercooked poultry with inflammatory diarrhea and curved gull-wing rods points to *Campylobacter*; a daycare outbreak with a tiny infectious dose points to *Shigella*.
- ▶ Prolonged fever after contaminated food with intracellular macrophage survival points to *Salmonella Typhi*.

What You Need to Memorize

- *Campylobacter* follows poultry exposure and can trigger Guillain-Barré syndrome or reactive arthritis.
- *Shigella* has a very low infectious dose, invades colonic M cells, and spreads cell to cell to cause **inflammatory bloody diarrhea**.
- *Salmonella Typhi* survives in **macrophages**; nontyphoidal *Salmonella* can cause osteomyelitis and antibiotics may prolong shedding in uncomplicated gastroenteritis.
- *V. cholerae* causes profound secretory diarrhea; *V. vulnificus* causes hemorrhagic seawater wounds in liver disease or **iron overload**.

Don't Miss

- ★ ***V. parahaemolyticus* from seafood usually causes watery noninflammatory diarrhea without fecal leukocytes or erythrocytes.**

11. Spirochetes, Chlamydia & Mycoplasma

Tested Concept: syphilis / Lyme / sterile pyuria / walking pneumonia

How It's Tested

- ▶ A **painless chancre** or palm-and-sole rash asks for syphilis; cardiolipin tests need treponemal confirmation.
- ▶ **Cold-agglutinin** walking pneumonia asks for Mycoplasma; sterile urethritis asks for Chlamydia.

What You Need to Memorize

- T. pallidum crosses the placenta; congenital syphilis causes snuffles, palm/sole rash, and later dental/bone changes.
- Mycoplasma lacks peptidoglycan, requires cholesterol, and needs non-beta-lactam therapy.
- Chlamydia is **obligately intracellular**; it causes sterile pyuria, and L1-L3 causes LGV.
- **Animal-urine water** exposure can cause leptospirosis with jaundice, renal failure, and **conjunctival suffusion**.

Don't Miss

- ★ **Fever, rigors, and hypotension after spirochete treatment suggest Jarisch-Herxheimer reaction, not allergy.**

12. HSV & Varicella-Zoster

Tested Concept: sensory-ganglion latency / recurrent vesicles / antiviral activation

How It's Tested

- ▶ **Painful grouped oral or genital vesicles that recur after symptom-free intervals** ask for HSV reactivation from sensory ganglia.
- ▶ A **painful unilateral dermatomal eruption or ophthalmic-distribution vesicles** asks for VZV reactivation.

What You Need to Memorize

- HSV and VZV establish latency in sensory neuronal cell bodies and reactivate along the affected dermatome or mucosal distribution.
- PCR is the preferred diagnostic test for genital HSV.
- Acyclovir is activated by viral thymidine kinase and then inhibits viral DNA polymerase.
- Primary varicella produces diffuse pruritic vesicles in multiple stages; zoster can be followed by postherpetic neuralgia.

Don't Miss

- ★ **HSV esophagitis causes small volcano-like ulcers; CMV causes large linear ulcers.**

13. Neisseria Species

Tested Concept: meningococcemia / gonococcal dissemination / antigenic variation

How It's Tested

- ▶ Fever, petechiae, shock, DIC, and adrenal hemorrhage ask for meningococcemia driven by LOS endotoxin.
- ▶ Migratory polyarthralgia, **tenosynovitis**, and pustular skin lesions ask for disseminated gonococcal infection.

What You Need to Memorize

- Neisseria are oxidase-positive gram-negative diplococci
- Meningococcal pili mediate nasopharyngeal attachment; bloodstream spread can cross the choroid plexus to the meninges.
- Gonococcal pili and outer-membrane proteins undergo antigenic and phase variation, preventing durable immunity and allowing reinfection.
- Gonococcal PID scars fallopian tubes, causing infertility and **ectopic pregnancy**; close meningococcal contacts need chemoprophylaxis.

Don't Miss

- ★ Neisseria has lipooligosaccharide rather than LPS; its lipid A component drives septic shock.

14. Viral Hepatitis: HBV, HCV & HDV

Tested Concept: serology / reverse transcription / chronicity / viral dependence

How It's Tested

- ▶ Isolated anti-HBs indicates vaccination; persistent HBsAg with HBeAg indicates chronic highly infectious HBV.
- ▶ Chronic hepatitis progressing to cirrhosis and HCC, with rapid envelope variation, asks for HCV.

What You Need to Memorize

- HBV makes an RNA intermediate from DNA, then reverse-transcribes RNA into partially double-stranded DNA.
- HBsAg = active infection; anti-HBs = immunity; HBeAg = active replication and **high infectivity**.
- HDV requires HBsAg for its envelope, so HBV vaccination also prevents HDV.
- HCV RNA polymerase lacks proofreading → quasispecies, immune escape, chronic infection, and HCC risk.

Don't Miss

- ★ Isolated anti-HBs means vaccination, not resolved natural infection.

15. Listeria & Intracellular Bacteria

Tested Concept: Listeria / Ehrlichia / Bartonella / Coxiella / rickettsiae

How It's Tested

- ▶ Pregnancy or neonatal meningitis after eating **meats/cheeses**, asks for Listeria.
- ▶ Tick exposure with cytopenias and morulae asks for Ehrlichia; vascular red-purple lesions in AIDS asks for Bartonella.

What You Need to Memorize

- Listeria is foodborne, shows tumbling motility, **escapes phagosomes** through listeriolysin O, and requires cell-mediated immunity.
- Listeria is resistant to cephalosporins; use ampicillin in high-risk meningitis (elderly patients).
- Ehrlichia causes fever, leukopenia, thrombocytopenia, transaminitis, and morulae in monocytes; treat with doxycycline.
- Bartonella causes cat-scratch disease or bacillary angiomatosis; Coxiella causes Q fever after inhaled livestock aerosols.

Don't Miss

- ★ Do not rely on a cephalosporin for Listeria meningitis.

16. Endemic Dimorphic Fungi

Tested Concept: Histoplasma / Blastomyces / Coccidioides

How It's Tested

- ▶ Ohio-Mississippi exposure with **small intracellular yeasts in macrophages** asks for Histoplasma; a broad-based bud asks for Blastomyces.
- ▶ Arizona or California exposure with tissue spherules filled with **endospores** asks for Coccidioides.

What You Need to Memorize

- Histoplasma is inhaled and survives as small intracellular yeasts within macrophages.
- Blastomyces is a large broad-based budding yeast that can cause pulmonary and cutaneous disease.
- Coccidioides is endemic to the desert Southwest and forms tissue spherules containing endospores.

Don't Miss

- ★ Coccidioides forms spherules in tissue; Histoplasma forms small intracellular yeasts; Blastomyces forms broad-based buds.

17. Epstein-Barr & Cytomegalovirus

Tested Concept: mononucleosis / B-cell tropism / reactivation / congenital disease

How It's Tested

- ▶ *Heterophile-positive mononucleosis suggests EBV; heterophile-negative mononucleosis after transfusion suggests CMV.*
- ▶ *AIDS with **large linear esophageal ulcers** or colitis with enlarged inclusion-bearing cells suggests CMV reactivation.*

What You Need to Memorize

- EBV binds CD21 on B cells; the atypical lymphocytes on smear are reactive CD8 T cells.
- EBV spreads through saliva and is associated with **nasopharyngeal carcinoma and B-cell lymphomas**.
- CMV is an enveloped dsDNA herpesvirus that causes **transplant** pneumonitis, colitis, esophagitis, and heterophile-negative mononucleosis.
- Congenital CMV causes **hearing loss**, microcephaly, periventricular calcifications, and **chorioretinitis**.

Don't Miss

- ★ **EBV infects B cells, but the large atypical lymphocytes are reactive CD8 T cells.**

18. Bacterial Toxins & Virulence Factors

Tested Concept: EF-2 / cAMP / Shiga toxin / endotoxin / antitoxin

How It's Tested

- ▶ *A **gray pseudomembrane** with myocarditis asks for diphtheria toxin; profuse secretory diarrhea asks for cholera toxin.*
- ▶ *Bloody diarrhea followed by HUS asks for Shiga toxin-mediated 60S ribosomal inactivation.*

What You Need to Memorize

- Diphtheria toxin and Pseudomonas exotoxin A **ADP-ribosylate EF-2** → blocked protein synthesis.
- Diphtheria toxin production requires lysogenic phage conversion; pertussis toxin and anthrax edema factor **raise intracellular cAMP**.
- Lipid A activates TLR4 and drives septic shock.
- IgA proteases promote mucosal colonization by disabling secretory IgA.

Don't Miss

- ★ **Antitoxin neutralizes circulating toxin only; it cannot reverse toxin already internalized by cells.**

19. Malaria & Babesiosis

Tested Concept: hepatic hypnozoites / erythrocyte rupture / Ixodes / Maltese cross

How It's Tested

- ▶ Relapsing malaria months after travel asks for **dormant hepatic hypnozoites** of *P. vivax* or *P. ovale*.
- ▶ **New England** tick exposure with hemolysis, asplenia, and **Maltese-cross tetrads** asks for *Babesia*.

What You Need to Memorize

- *P. vivax* and *P. ovale* relapse from hepatic hypnozoites; erythrocytic drugs alone do not eliminate the dormant liver stage.
- *P. falciparum* infects erythrocytes of all ages → high parasitemia; severe disease requires IV artesunate.
- Malarial fever paroxysms follow synchronized rupture of infected erythrocytes.
- Human malaria is transmitted by the female *Anopheles* mosquito; *Babesia* is transmitted by Ixodes and has no hepatic stage.

Don't Miss

- ★ **Maltese-cross tetrads and Ixodes exposure indicate Babesia; hepatic hypnozoites indicate *P. vivax* or *P. ovale*.**

20. Intestinal & Tissue Protozoa

Tested Concept: Giardia / Entamoeba / Trichomonas / Leishmania / Chagas

How It's Tested

- ▶ Foul-smelling greasy diarrhea after **drinking stream water** asks for *Giardia*; dysentery with **flask-shaped ulcers** and **RUQ pain** asks for *Entamoeba*.
- ▶ **Yellow-green** frothy discharge with motile organisms asks for *Trichomonas*; cardiomyopathy with **megaesophagus** after triatomine exposure asks for Chagas disease.

What You Need to Memorize

- *Giardia* causes noninvasive malabsorptive diarrhea, is associated with IgA deficiency, and is treated with **metronidazole**.
- *Entamoeba* invades the colon and can spread through the portal system to an **anchovy-paste liver abscess**.
- *Trichomonas* is diagnosed by motile flagellates on saline wet mount; treat the patient and sexual partners with metronidazole.
- *Leishmania* is sand-fly transmitted with intracellular **amastigotes** and kinetoplasts; *T. cruzi* causes Chagas cardiomyopathy and megasyndromes.

Don't Miss

- ★ ***Giardia* is noninvasive and greasy; *Entamoeba* is invasive and can cause dysentery and liver abscess.**

21. Mycobacteria

Tested Concept: tuberculosis / acid-fast wall / resistance / MAC / leprosy

How It's Tested

- ▶ *Apical cavitation, acid fast, and long culture growth ask for reactivation tuberculosis.*
- ▶ *Advanced AIDS with fever, diarrhea, hepatosplenomegaly, and AFB-filled macrophages asks for mycobacterium avium complex.*

What You Need to Memorize

- In TB, mycolic acids cause acid-fastness; cord factor causes serpentine cording and tracks with virulence.
- Early M. tuberculosis proliferates in macrophage phagosomes before Th1 granulomas form.
- KatG activates isoniazid; KatG loss causes TB resistance, and multidrug therapy limits mutant selection.
- M. leprae invades Schwann cells → anesthetic hypopigmented lesions.

Don't Miss

- ★ **Nocardia is branching and partially acid-fast, but is not a mycobacterium.**

22. Other DNA Viruses

Tested Concept: HPV / parvovirus B19 / JC virus / poxvirus / adenovirus

How It's Tested

- ▶ *Recurrent laryngeal papillomas or **oropharyngeal carcinoma** asks for HPV; sickle-cell aplastic crisis or fetal hydrops asks for parvovirus B19.*
- ▶ *Progressive neurologic deficits with demyelinating white-matter lesions in severe immunosuppression asks for JC virus PML.*

What You Need to Memorize

- HPV 6/11 causes benign papillomas; **HPV 16/18** are strongly associated with oropharyngeal squamous cell carcinoma.
- Parvovirus B19 is a nonenveloped ssDNA virus that targets P-antigen-positive erythroid precursors.
- JC virus infects oligodendrocytes and causes progressive multifocal leukoencephalopathy in severe immunosuppression.
- Molluscum contagiosum is a poxvirus with umbilicated papules and Henderson-Patterson bodies.

Don't Miss

- ★ **HPV 6/11 are low-risk papilloma types; HPV 16/18 are cancer causing.**

23. Arboviruses & Congenital Viral Infection

Tested Concept: West Nile / dengue / chikungunya / rubella / Zika

How It's Tested

- ▶ *Mosquito-borne encephalitis with asymmetric flaccid weakness in an older adult asks for West Nile virus.*
- ▶ *Aedes exposure with prolonged severe arthralgia suggests chikungunya; severe disease after a different dengue serotype suggests antibody-dependent enhancement.*

What You Need to Memorize

- West Nile can cause **meningoencephalitis** with **asymmetric** flaccid paralysis.
- Chikungunya is especially associated with severe persistent polyarthralgia.
- Congenital rubella causes **cataracts**, **sensorineural deafness**, and **PDA**; prevent with MMR before pregnancy.
- Maternal Zika infection can cause severe fetal **microcephaly** and intracranial calcifications.

Don't Miss

- ★ **Severe secondary dengue is antibody-dependent enhancement from nonneutralizing antibodies to a different serotype.**

24. Toxoplasma & Neuroinvasive Parasites

Tested Concept: ring-enhancing lesions / neurocysticercosis / Naegleria / eosinophilic meningitis

How It's Tested

- ▶ *Advanced AIDS with **multiple ring-enhancing** brain lesions asks for toxoplasmosis; an immunocompetent patient with **calcified cystic lesions** asks for neurocysticercosis.*
- ▶ ***Rapid meningitis** after **warm freshwater** forced into the nose asks for Naegleria; eosinophilic meningitis after raw snails asks for Angiostrongylus.*

What You Need to Memorize

- Toxoplasma reactivates in AIDS and is acquired from cat-contaminated soil or undercooked meat; cerebral disease is treated with pyrimethamine, sulfadiazine, and leucovorin.
- Congenital toxoplasmosis causes hydrocephalus, diffuse intracranial calcifications, and chorioretinitis.
- Neurocysticercosis follows fecal-oral ingestion of *T. solium* eggs from a human carrier, producing cystic or calcified brain lesions.
- Naegleria travels along olfactory nerves through the cribriform plate; Angiostrongylus causes eosinophilic meningitis after raw snails or slugs.

Don't Miss

- ★ **Eating undercooked pork causes intestinal taeniasis; neurocysticercosis requires ingestion of *T. solium* eggs.**

25. Influenza Virus

Tested Concept: hemagglutinin / neuraminidase / drift / shift

How It's Tested

- ▶ *Reduced vaccine efficacy within the same influenza subtype asks for antigenic drift; a pandemic strain after coinfection asks for antigenic shift.*
- ▶ *A question asks which surface protein mediates attachment or is targeted by protective neutralizing antibodies.*

What You Need to Memorize

- **Hemagglutinin binds** sialic acid and is the major antibody target in treatment.
- **Neuraminidase cleaves** sialic acid to release progeny virions; neuraminidase inhibition blocks viral release.
- Antigenic drift = gradual point mutations; antigenic shift = reassortment of segmented influenza genomes.
- Influenza is enveloped, so alcohol-based disinfectants readily disrupt its lipid bilayer.

Don't Miss

- ★ **Drift causes seasonal mismatch; shift requires reassortment and can produce pandemics.**

GET MORE FREE STEP 1 STUDY SHEETS

If this guide helped, click below for more free high-yield resources from RxMnemonic.

[Visit RxMnemonic.com](https://rxmnemonic.com)