An Introduction to Opportunistic Infections

Ellen Kitchell, M.D.

July 14, 2015

Opportunistic

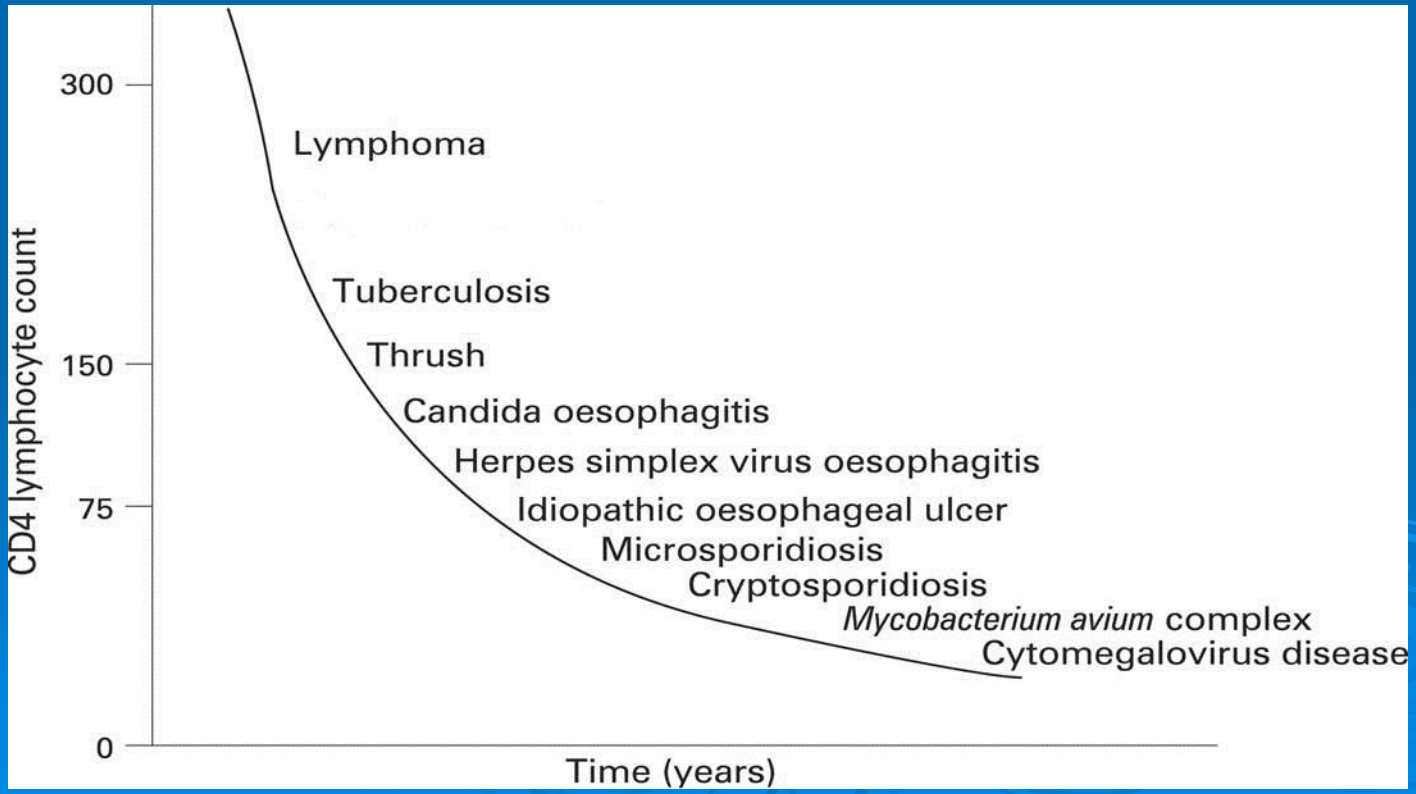
- **op·por·tun·is·tic**/ˌäpərt(y)o͞oˈnistik/
- Adjective:
  - Exploiting chances offered by immediate circumstances without reference to moral principle.
  - (of a plant or animal) Able to spread quickly in a previously unexploited habitat.

Opportunistic Infections

- In resource-plentiful settings, with early diagnosis, becoming much less common
- However, in patient population with low CD4 count more common
- Differential diagnosis driven by the CD4 count

Importance of CD4 Count and Viral Load

- Predictive of occurrence of opportunistic infections

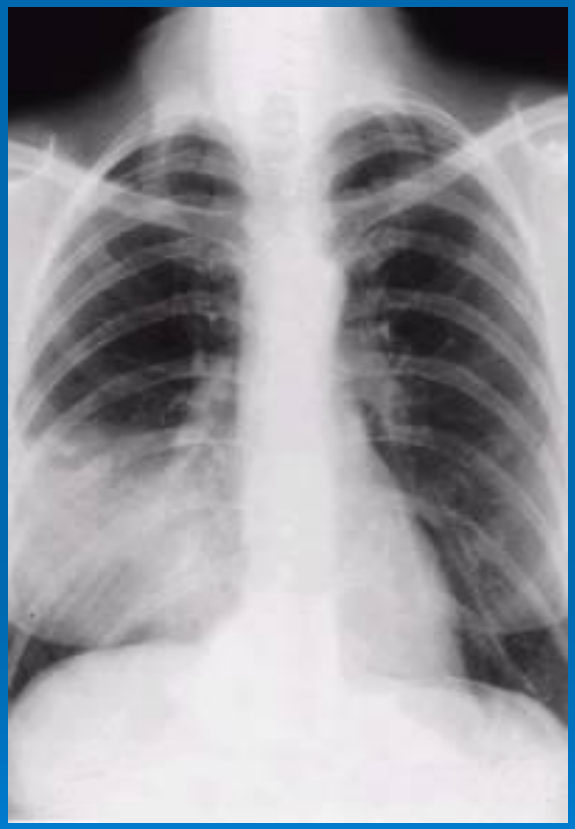


Guidelines

- http://www.aidsinfo.nih.gov/guidelines

Pulmonary Disease

Case 1



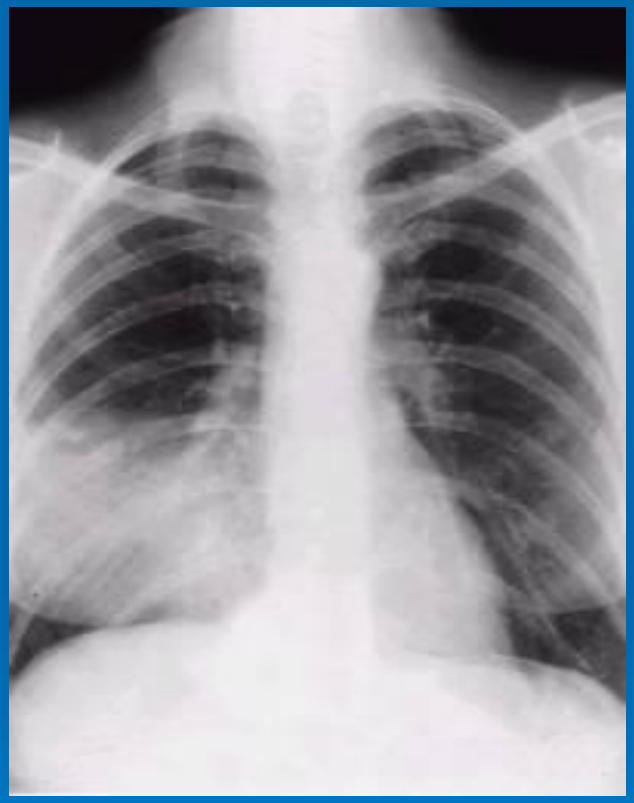
CD4 = 450 cells/uL

5 days of fevers, chills, chest pain, cough productive of purulent sputum and dyspnea

Exam: bronchophony, egophony, increased fremitus, bronchovesicular breath sounds on R

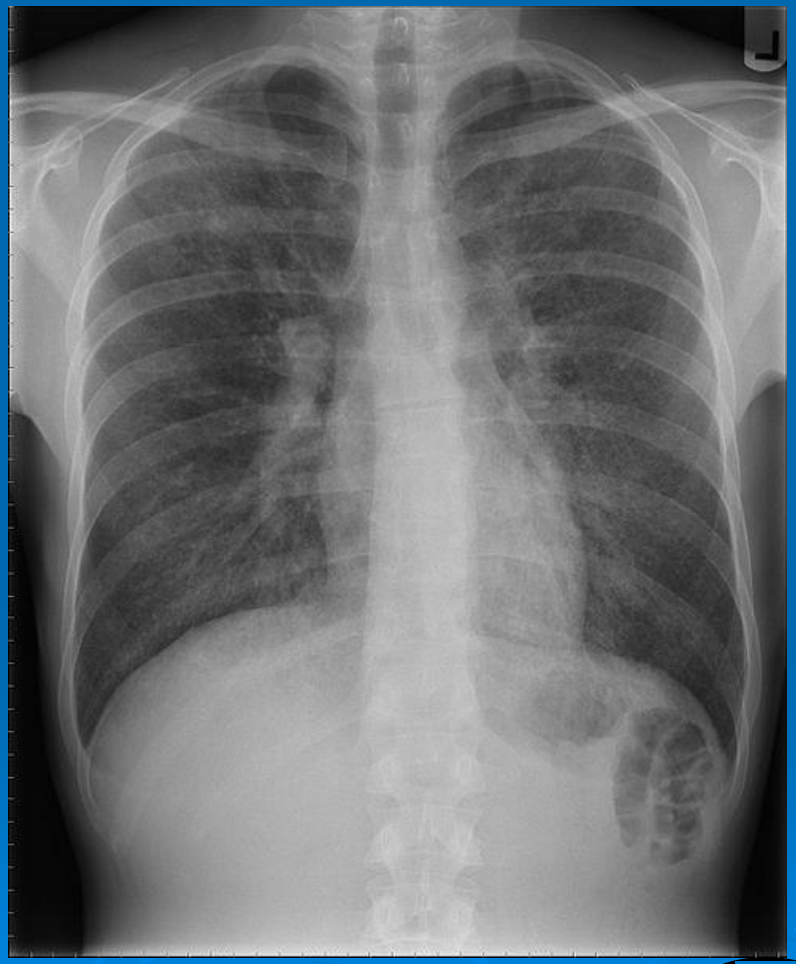
- When CD4 > 250 cells/uL, differential diagnosis includes primarily:
  - Bacterial pneumonia
  - TB
  - Non-Hodgkin's lymphoma
  - Non-HIV associated disease (pulmonary edema, hemorrhage, rheumatologic)

Pulmonary Disease



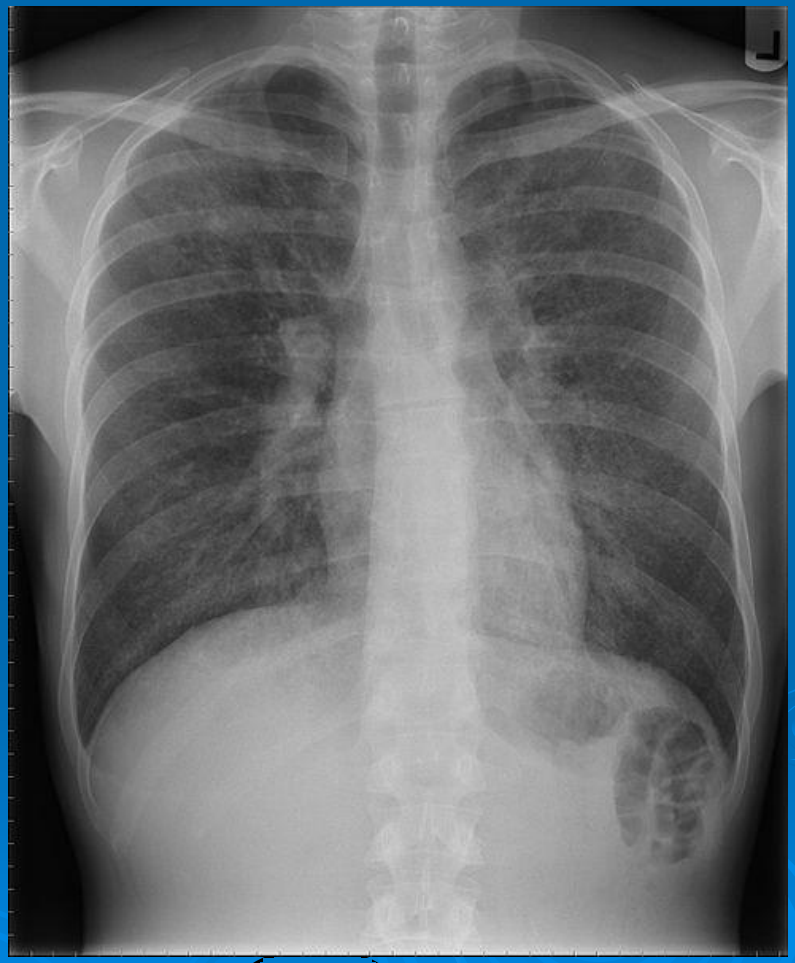
- Bacterial pneumonia is the most frequent HIV-associated pulmonary disease reported
  - S. pneumoniae
  - Haemophilus
  - Pseudomonas aeruginosa (CD4 < 50)

Case 2



Differential Diagnosis: Diffuse Interstitial Infiltrates

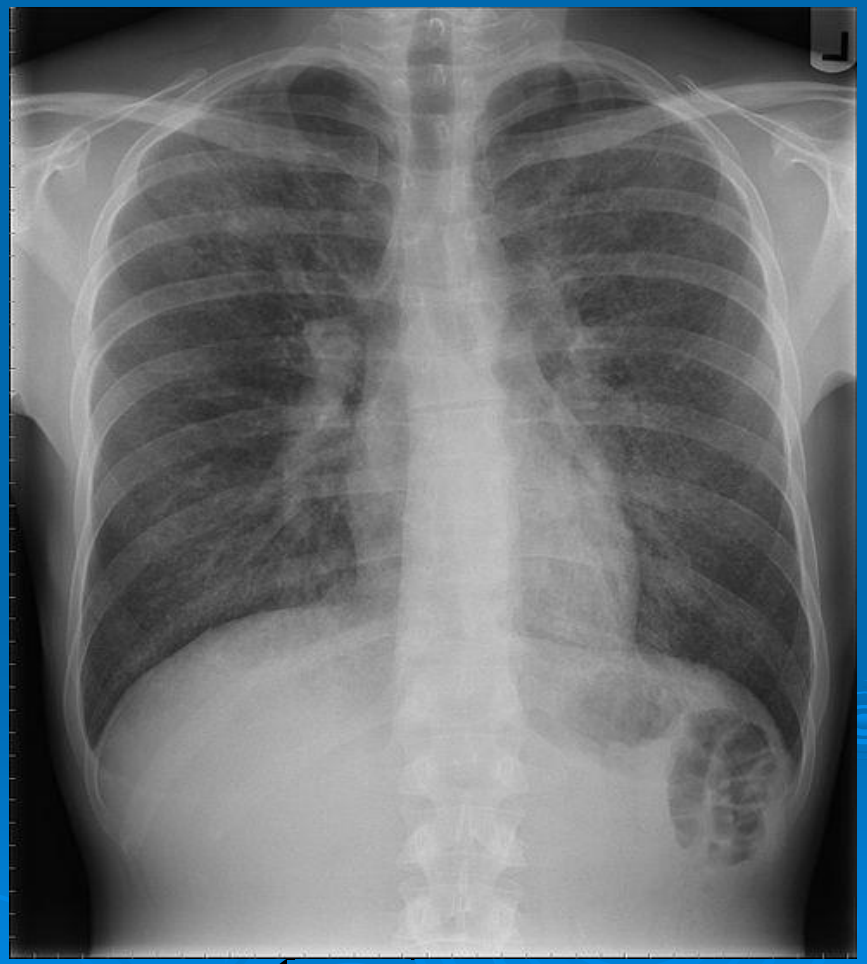
- *Pneumocystis jirovecii*
- Fungal (*Histoplasma, Cryptococcus, Coccidioides*)
- Mycobacterial disease
- Nonspecific/lymphocytic interstitial pneumonitis
- Early pulmonary Kaposi's sarcoma or lymphoma



CXR Findings in *Pneumocystis*

- Interstitial, bilateral reticulonodular infiltrate
- Lobar infiltrates
- Pneumothorax, cysts
- Clear CXR

- Does NOT cause adenopathy or pleural effusions



Pneumocystis pneumonia

- Classically presents with 2-4 weeks of gradually progressive symptoms
- Non-productive cough
- “Poor-man’s” test (very sensitive for PCP): exercise desaturation test

Diagnosis of PCP

- Elevated serum LDH (>200 but usually <500)
- Elevated beta-D-glucan (Fungitell)
- Sputum or induced sputum DFA (variable sensitivity 75-92%)
- BAL/biopsy
- Open lung biopsy

Treatment of PCP: Preferred

- Trimethoprim-sulfamethoxazole
- Dose: 5 mg/kg IV/PO q 8hr
- Adjust based on creatinine clearance
- Normal dose in mild-moderate disease: 2 DS (800/160 mg) tabs TID x 21 days

Treatment of PCP

- Write prescription to include prophylaxis dose once treatment is concluded:
  - Bactrim DS 2 tabs PO TID x 21 days, then 1 tab PO daily x forever

When to Use Steroids

- Patients with PCP often worsen in the first several days of therapy as the organisms die
- In patients with poor reserve, steroids are recommended to prevent clinical deterioration
- Criteria: PaO2 <70 or A-a gradient >30 on ABG
- Preferred steroid dose: prednisone 40 mg PO BID x 5 days, then 40 mg/day x 5 days, then 20 mg/day x 10 days; Solumedrol IV as alternate

PCP: Alternatives for Severe Disease

- In patients with severe sulfa allergy, can either perform desensitization procedure or give IV pentamidine
- Pentamidine 4 mg/kg IV x 21 days
- Major side effects include: nephrotoxicity, hypotension, hypo/hyperglycemia, pancreatitis, QT prolongation

PCP: Alternatives in Mild-Moderate Disease

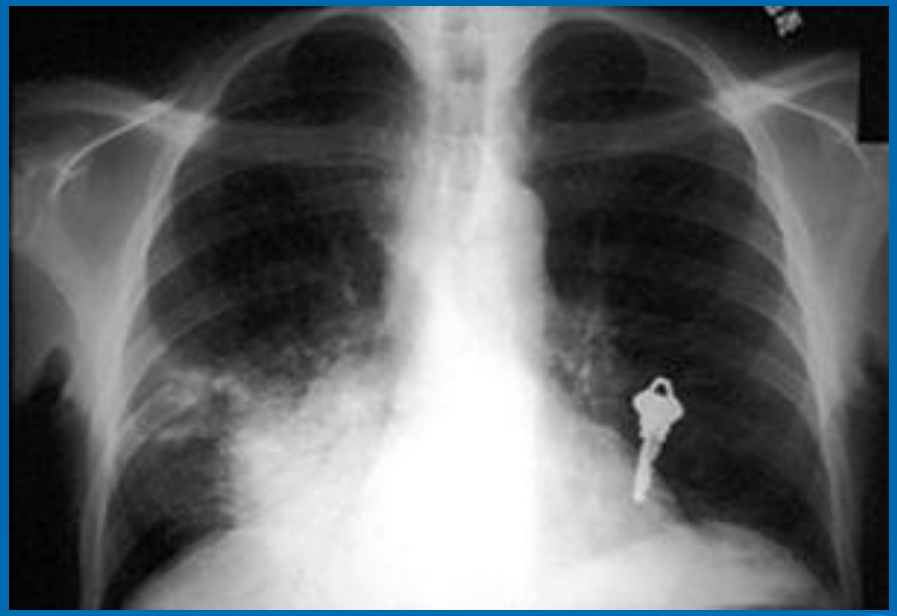
- TMP-SMX is preferred agent with best outcomes
- In mild-moderate disease can use the following in order of activity if intolerance/toxicity:
  1. Clindamycin 600 mg IV q8hr (or 450 mg PO q6hr) + primaquine base 15-30 mg PO daily
     - Need to check G6PD status prior to using primaquine
  2. Atovaquone suspension 750 mg PO BID
     - GI intolerance, cost
  3. Dapsone 100 mg PO daily + trimethoprim 15 mg/kg/day divided TID x 21 days
     - Need to check G6PD status prior to using dapsone

Failure to Respond to Treatment

- Resistance to trimethoprim/sulfa is extremely rare
- Confirm diagnosis of PCP, evaluate for other coinfections
- Consider switch to trimethoprim/sulfa if on alternate regimen; switch to pentamidine if not responding to trimethoprim/sulfa

Case 3

- CD4 100 cells/uL
- 3 month history of fever/chills, night sweats, cough productive of yellowish sputum



Tuberculosis

- Characteristic radiographic presentation of TB depends on the CD4 cell count
  - “High” CD4 count = upper lung zone disease, often with cavitation
  - “Low” CD4 count = diffuse disease (including miliary), mid+lower lung zone disease, cavitation less common, hilar and mediastinal adenopathy

Tuberculosis—Key Points

- Diagnosis with AFB sputum samples
- HIV+ patients are more likely to develop paucibacillary disease (smear-negative, culture-positive)
- Consider MTB PCR on high-risk patients
- T-spot/PPD may be negative in AIDS patients despite active TB

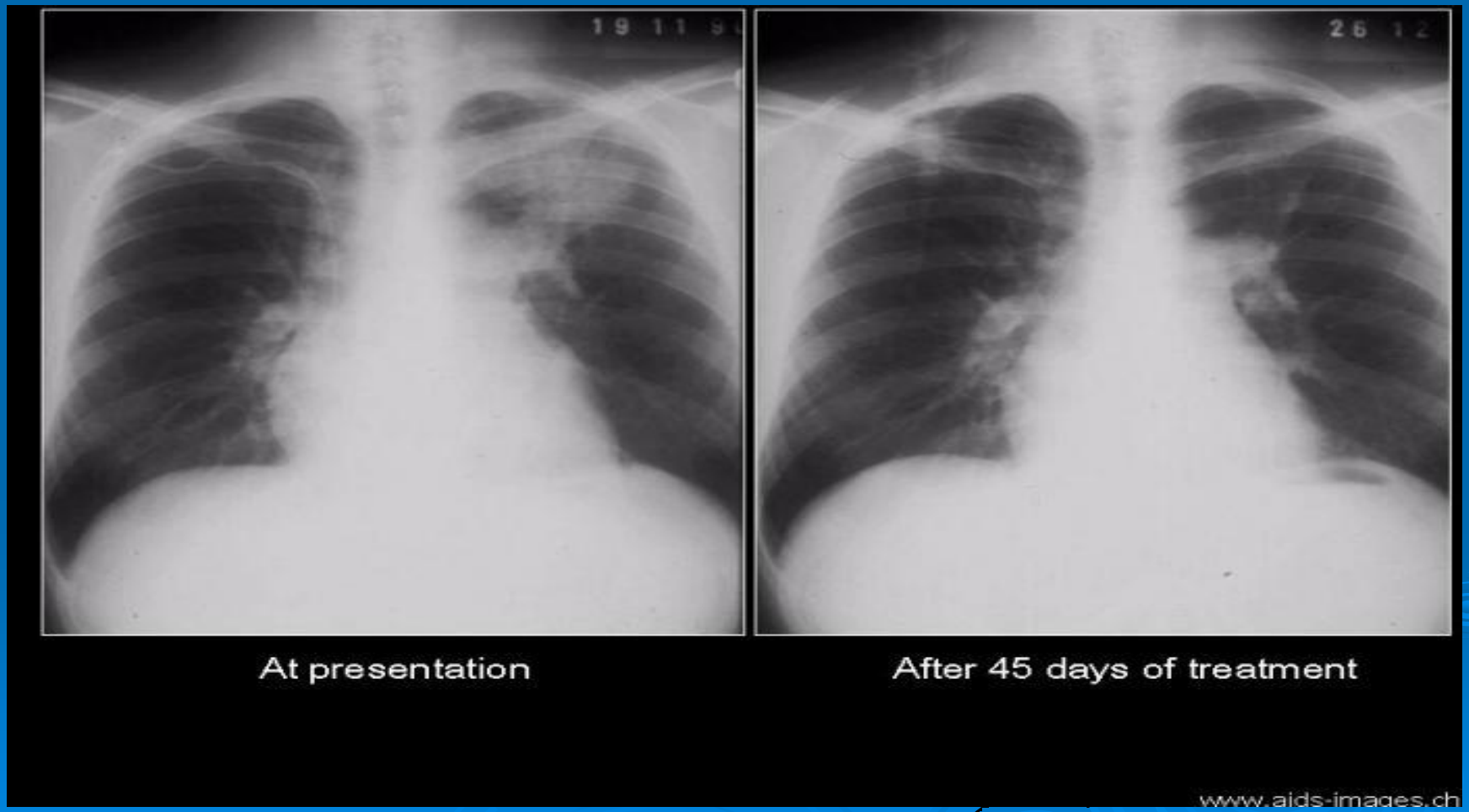
Tuberculosis Treatment

- MAJOR drug interactions between HIV and rifamycins, usually requiring dose adjustments of HIV medications and/or TB medications

Case 4

- 50 y/o M, florist
- CD4 = 96
- Cough productive of purulent sputum, fever, weight loss, malaise x 4 weeks

Case 3


At presentation
After 45 days of treatment
www.aids-images.ch

Cavitary Disease in HIV+ with Low CD4

- *Pneumocystis jiroveci*
- *Pseudomonas aeruginosa*
- *Staphylococcus aureus*
- *Rhodococcus equi*
- *Nocardia*
- *Cryptococcus* and other endemic fungal infections
- *Aspergillus*

Nocardia

- CXR: infiltrates, nodules, often cavitary
- CD4 < 100 cells/uL
- May spread through adjacent tissues from lung
- 50% have disseminated disease at presentation, most commonly brain abscess

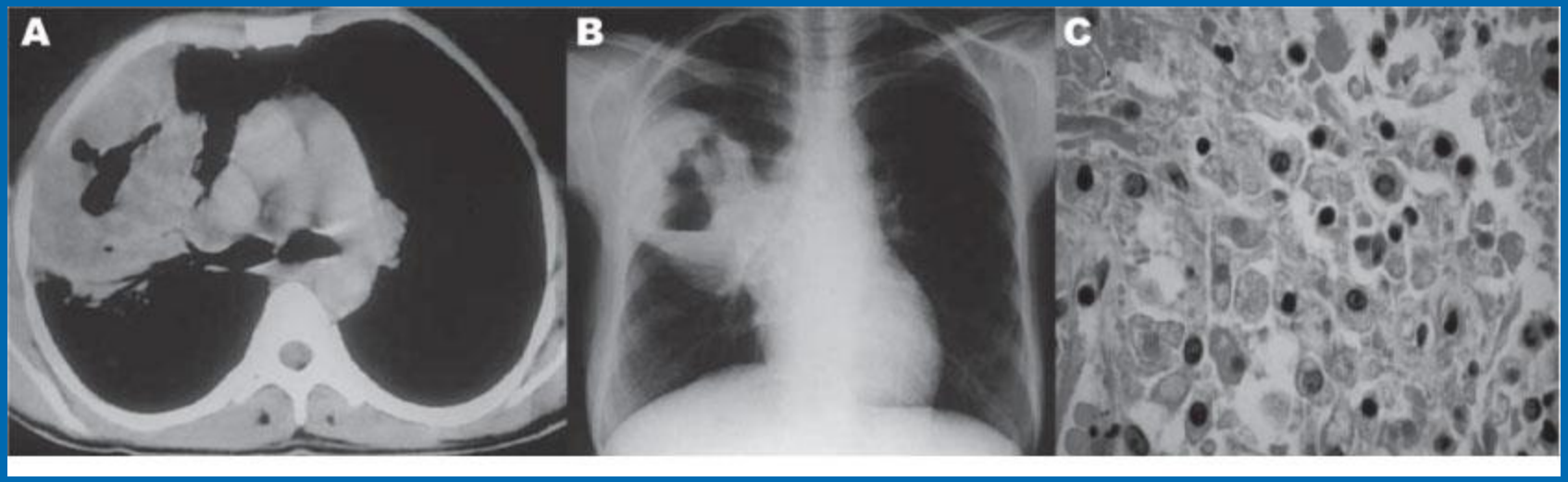
Nocardia Treatment

- Combination therapy usually used in serious disease
- For most species of *Nocardia*, sulfonamides preferred
- Usually susceptible to ceftriaxone, carbapenems, tetracyclines, macrolides

Case 4

- Patient with CD4 of 50 cells/uL
- Presents with 4 week course of cough, fever
- Works on a farm

Case 4



Rhodococcus equi

- Gram-positive aerobic bacteria, can stain acid-fast
- Classical case is exposure to horses, but ~50% no history
- Primarily occurs in patients with CD4 <100 cells/uL
- Blood cultures may be positive (can be confused with *Corynebacterium* contaminant)
- Often requires invasive diagnosis
- Often disseminates to extrapulmonary sources

Treatment of *Rhodococcus*

- Combination therapy preferred, including addition of >1 antibiotic with intracellular penetration
- Usually susceptible to macrolides, vancomycin, aminoglycosides, rifampin, carbapenem, linezolid

NON-INFECTIOUS PULMONARY COMPLICATIONS

Respiratory Failure in HIV

- Patients with HIV are hypercoagulable
- Can have antiphospholipid-anticardiolipin antibodies, decreased activities of natural anticoagulants (especially protein S), and increased platelet activation
- Don’t forget pulmonary embolism in patients with clear CXR

Pulmonary Kaposi's Sarcoma

- Pulmonary KS can present in the absence of mucocutaneous lesions, although most patients with pulmonary KS do have skin findings
- CXR: Bilateral perihilar infiltrates, reticulonodular, adenopathy, bloody pleural effusions
- Diagnosis: Bronchoscopy, BAL to r/o OI

Evaluation of Patient with Pulmonary Disease and Low CD4

- Bacterial blood cultures
- Bacterial sputum cultures
- PCP DFA x 3
- Fungitell
- Fungal blood cultures
- Cryptococcal antigen in blood
- *Histoplasma* antigen in urine
- AFB blood and sputum cultures, consider MTB PCR
- *Nocardia* cultures
- Bronchoscopy!

Neurologic Disease

Cryptococcal Meningitis

- CD4 <100 cells/uL
- Subacute (weeks to months) onset of fever, confusion, headache, occ seizures
- May not have stiff neck
- Cranial nerve (esp. II and VIII) involvement
- Pulmonary disease, positive blood cultures

Diagnosis of Cryptococcal Meningitis

- Cryptococcal antigen is extremely sensitive (>95%), in serum and CSF
- CSF may be bland (few WBC, may have increased protein)
- Serum and CSF fungal cultures
- India ink exam not used

Treatment of Cryptococcal Meningitis

- IV Ambisome 3-4 mg/kg/day + 5-flucytosine x 14 days followed by fluconazole 400 mg PO x 4 weeks
- Secondary prophylaxis with fluconazole 200 mg PO until CD4 count rises on HAART
- In mild disease, high dose fluconazole 400-800 mg/day can be used
- Echinocandins are NOT effective against *Cryptococcus*

Side Effects of *Cryptococcus* Therapy

- Ambisome:
  - Reversible acute renal failure in most patients
  - Mild azotemia often tolerated in severe disease
  - Potassium, magnesium, phosphorus wasting
  - Erythropoeitin-induced anemia common
  - Other cytopenias uncommon
- 5-flucytosine:
  - Cytopenias common
  - Renal failure
  - Monitor levels

Cryptococcal Meningitis: The Importance of Controlling Intracranial Pressure

- Advanced cryptococcal disease often associated with elevated ICP
- Only method of treating elevated ICP is through serial lumbar punctures until CSF opening pressure normalizes (steroids NOT effective)
- In severe cases, may require lumbar drain or VP shunt
- Untreated elevated ICP can lead to blindness, deafness, and death

Tuberculous Meningitis

- Usually presents as subacute process
- Pauci-bacillary disease
- Classical CSF: lymphocytic pleocytosis, increased protein, low glucose
- AFB culture, MTB PCR but poor sensitivity
- Treatment as with HIV- patients, including at least 4 drug therapy + steroids

CNS Mass Lesions

CNS Mass Lesions in Patients with AIDS

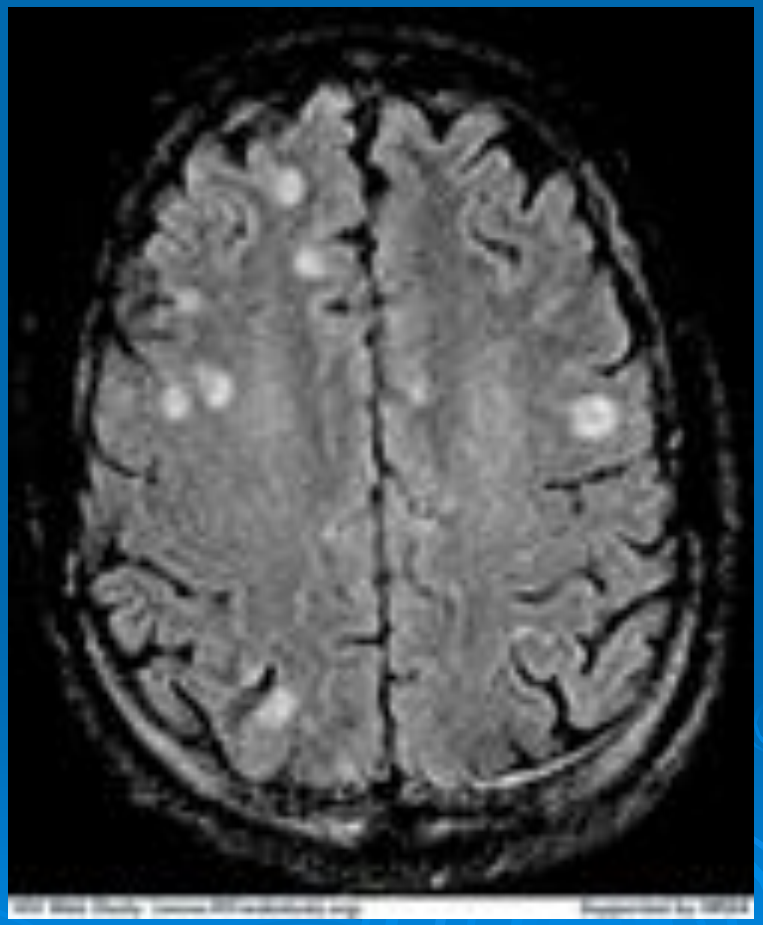
- Differential diagnosis is broad, top 2 are CNS toxoplasmosis and primary CNS lymphoma
- Also consider: Tuberculoma, Brain abscess secondary to bacterial infection (Staphylococcus, Streptococcus, Salmonella), Septic emboli, Candida abscess, Aspergilloma, Nocardia, Rhodococcus, Listeria, Cryptococcoma, Syphilitic gumma, Neurocystercercosis; other parasitic diseases including *Trypanosoma cruzi*, *Schistosoma*, and *Strongyloides stercoralis,* Cytomegalovirus, other primary or metastatic brain neoplasm

Toxoplasma Encephalitis

- Caused by *Toxoplasma gondii*
- Acquired early in life, primarily from undercooked meat
- Reactivation disease in immunocompromised patients
- Symptoms include: fever, headache, focal neurologic deficits, seizures

Toxoplasma Appearance on Imaging

- Usually multiple lesions
- Located in parietal or frontal lobes, thalamus, basal ganglia, or at cortico-medullary junction
- Ring enhancement present in 90%
- Edema with mass effect often seen
- Rarely can present as diffuse encephalitis

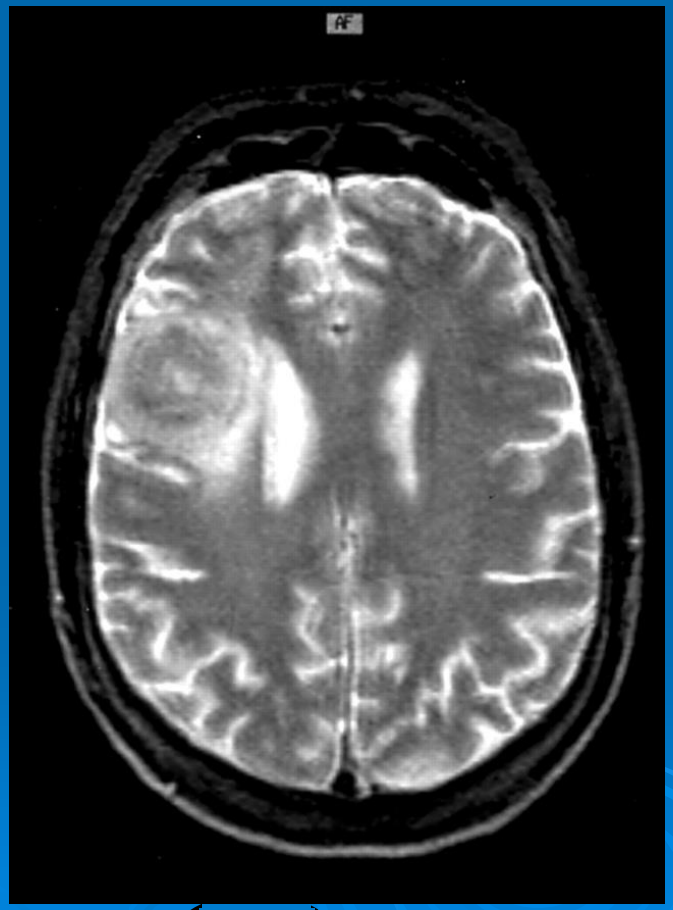


Toxoplasmosis Diagnosis

- *Toxoplasma* IgG in serum indicates past exposure to the parasite
  - Very sensitive for encephalitis (not IgM), not specific
  - If negative, strongly consider other causes
- *Toxoplasma* PCR in the CSF is specific but not sensitive for encephalitis (estimated ~70%)
- Often treat empirically if enough evidence for this diagnosis

Primary CNS Lymphoma

- >95% caused by reactivation of EBV
- Presents with headache, focal deficit and seizures
- 90%+ have elevated EBV PCR in CSF (100k-millions)
- Significantly improved survival in patients in HAART era
- Treated with palliative radiation



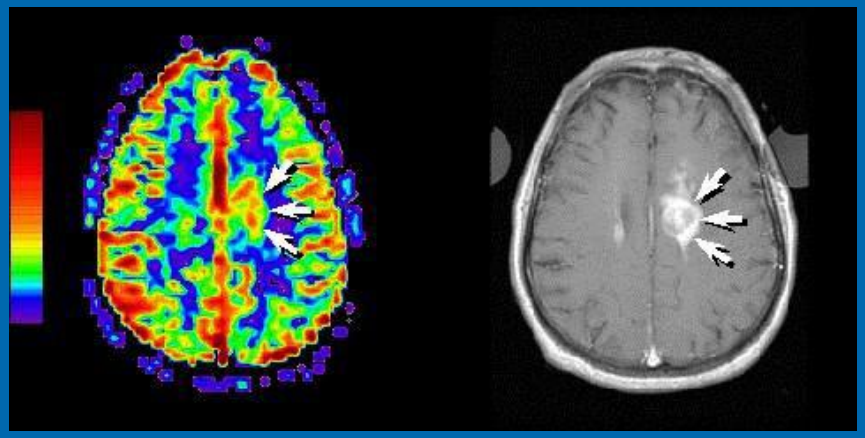
Diagnosis of CNS Mass Lesions

- Serum *Toxoplasma* IgG antibody (1:256 significant), cryptococcal antigen, RPR, LDH, AFB, fungal, aerobic/anaerobic blood cultures, urine *Histoplasma* antigen
- CSF: Gram stain and bacterial culture, *Mycobacterium tuberculosis* PCR, AFB smear and culture, Cryptococcal antigen, Histoplasma antigen, fungal culture, VDRL, EBV PCR, CMV PCR; *Toxoplasma* PCR

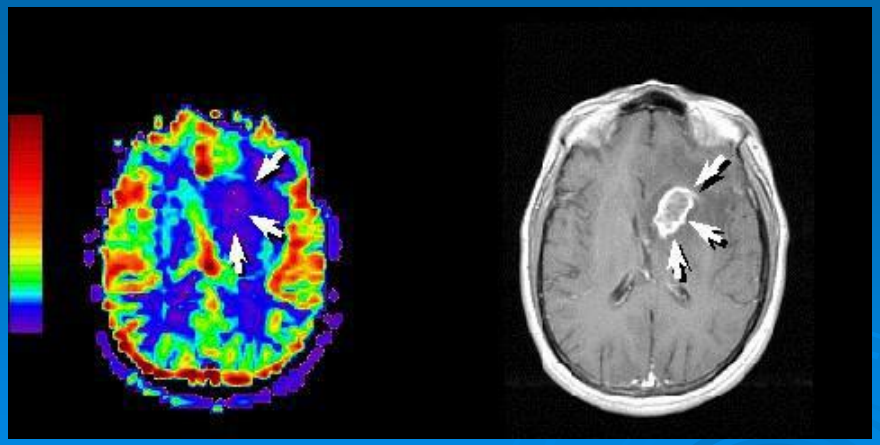
Imaging in CNS Mass Lesions

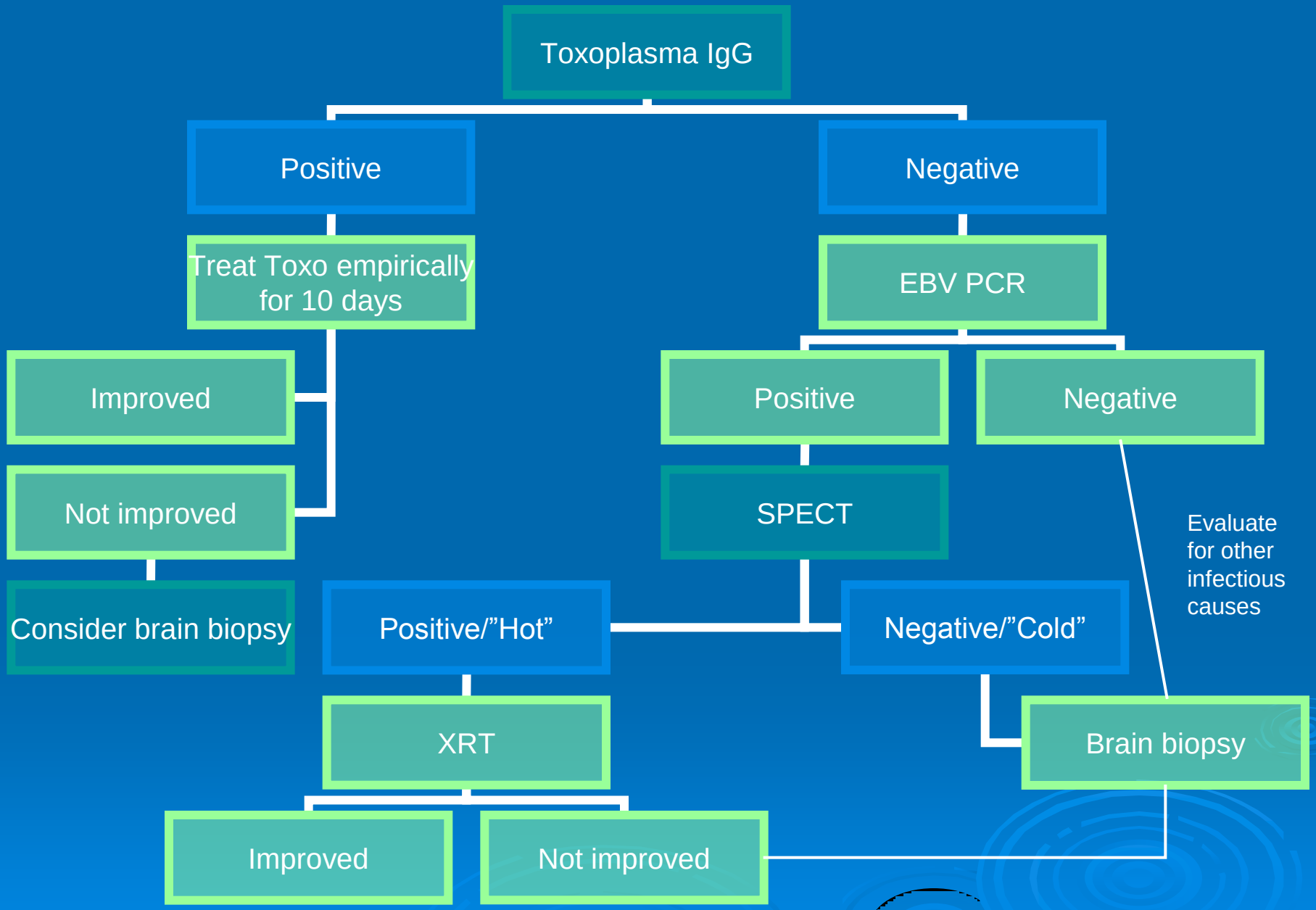
- MRI brain with contrast
- CXR
- SPECT
- Consider CT chest/abdomen/pelvis

SPECT



- Helps differentiate between malignant and non-malignant processes




Toxoplasma IgG
Positive
Negative
Treat Toxo empirically for 10 days
EBV PCR
Improved
Not improved
Positive
Negative
SPECT
Consider brain biopsy
Positive/"Hot"
Negative/"Cold"
Evaluate for other infectious causes
XRT
Brain biopsy
Improved
Not improved

Treatment of Toxoplasmosis

- Pyrimethamine 200 mg PO x 1, then 50-75 mg/day + sulfadiazine 1-1.5 g PO q6hr + leukovorin (folinic acid) 25 mg/day
- Alternatives to sulfadiazine, in order of efficacy:
  1. Clindamycin 600 mg IV/PO q6h
  2. Atovaquone 1500 mg PO BID
- Continue at least 6 weeks; longer if radiologic/clinical disease extensive

Toxoplasma Prophylaxis

- Sulfadiazine provides cross-prophylaxis against PCP (do NOT use Bactrim + sulfadiazine together)
- If patient on dapsone for PCP prophylaxis and Toxoplasma IgG is positive, needs weekly pyrimethamine/leukovorin as well

Secondary Prophylaxis for Toxoplasmosis

- Sulfadiazine 2000-4000 mg PO daily in 2 divided doses + pyrimethamine + leukovorin
- Clindamycin 600 mg PO q8hr + leukovorin + pyrimethamine (need another agent to prevent PJP)

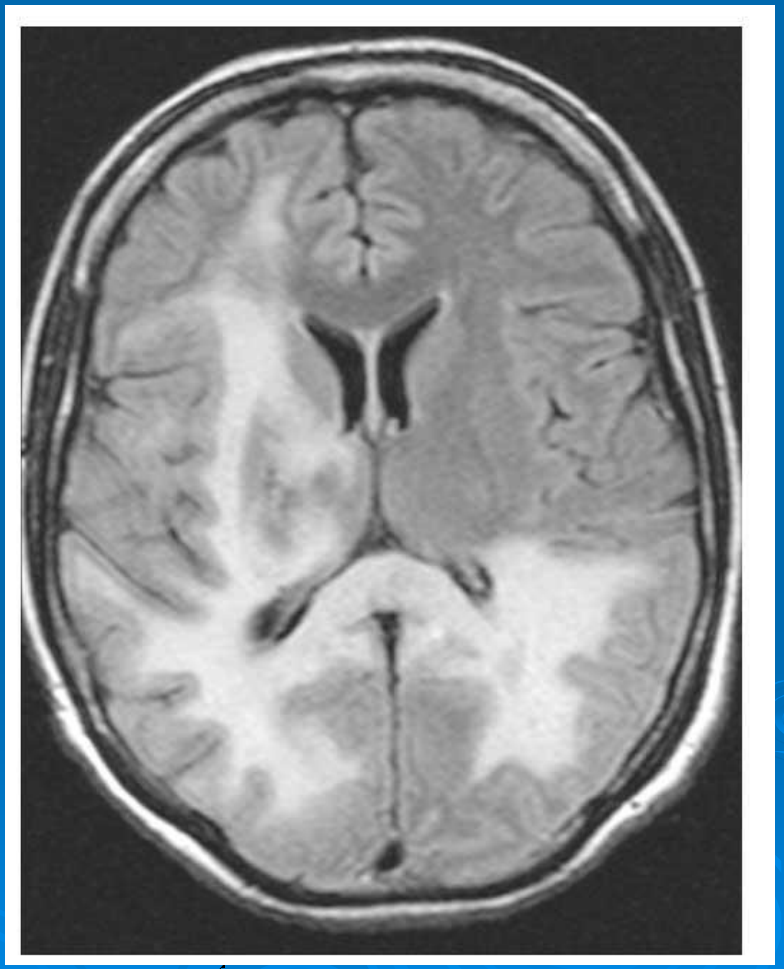
Discontinuing Secondary Prophylaxis for Toxoplasmosis

- Completed initial therapy
- Asymptomatic
- CD4 count >200 cells/uL for >6 months
- Consider repeat MRI to evaluate for resolution of lesions

White Matter Encephalitis

White Matter Encephalitis

- Presents with mental slowing, eventual focal neurologic symptoms, seizures, altered mental status/coma
- MRI shows periventricular white matter changes



Differential Diagnosis

- PML (progressive multifocal leukoencephalopathy)
- Cryptococcal meningoencephalitis
- CMV encephalitis
- VZV encephalitis
- HSV encephalitis
- HIV encephalitis (diagnosis of exclusion)

Diagnosis

- Lumbar puncture:
  - JC virus (causes PML)
  - CMV, HSV, VZV PCRs
  - HSV and VZV usually with abnormal CSF (WBC)

Treatment

- Specific therapies for viral encephalitis (acyclovir, ganciclovir)
- Early HAART only treatment for PML and HIV encephalopathy

Fever in HIV+

Fever of Unknown Origin in HIV

- Large differential diagnosis
- Send blood cultures, fungal blood cultures, fungal antibody complement fixation panel, AFB blood cultures, cryptococcal antigen, Histoplasma antigen from urine, consider Bartonella testing

Mycobacterium avium

- Environmental organism found in soil, water
- Disseminated infection common in CD4 <50 cells/uL
- Symptoms include fever, night sweats, wasting, diarrhea, abdominal pain, adenopathy, rarely HIV cholangiopathy
- Often causes pancytopenia and LFT abnormalities (obstructive pattern)

Diagnosis *M. avium*

- AFB blood cultures
- Isolation of MAI from respiratory and GI tract can be colonization

Treatment of *M.avium*

- Treatment: daily azithromycin + ethambutol
- Some add rifabutin (watch out for HIV drug interactions) in severe disease or suspected resistance (data from pre-HAART era)
- Primary prophylaxis with azithromycin or rifabutin when CD4 < 50 cells/uL, can discontinue when CD4 > 100 cells/uL for 3 months
- Urgent initiation of HAART

Histoplasmosis

- Caused by *Histoplasma capsulatum*
- Dallas is endemic area
- Symptoms include fever, adenopathy, cough/shortness of breath, pancytopenia
- CNS, GI, cutaneous involvement
- May present with septic-shock like syndrome

Diagnosis of Histoplasmosis

- Urine *Histoplasma* antigen
- Fungal blood cultures, cultures of sterile sites
- Fungal antibody by complement fixation may be positive

Treatment of Histoplasmosis

- In severe disease, Ambisome 3 mg/kg IV q24hr x 14 days (6+ weeks in CNS disease), then itraconazole
- If mild disease, itraconazole
- Itraconazole solution is preferred (10 mg/mL) to capsules (poorly absorbed)
  - 200 mg PO TID x 2 days, then 200 mg PO BID for prophylaxis indefinitely
  - Check levels, preferred >2 mcg/mL
  - Interacts with HIV medications

Prophylaxis

- Primary prophylaxis consider if high risk of occupational exposure and CD4 <150 cells/uL
- Secondary prophylaxis: 200 mg/day itraconazole
- Can discontinue secondary prophylaxis when: >1 year itraconazole, negative fungal blood cultures and Histoplasma antigen, CD4 >150 cells/uL, and ART > 6 months

Coccidioides

- Not found in Dallas except for travelers
- Risk when CD4 <250 cells/uL
- Focal pneumonia, diffuse pulmonary disease, meningitis, cutaneous disease, lymph node
- Diagnosis with culture/biopsy of specimen, complement fixation

Treatment

- Mild infection: itraconazole or fluconazole
- Severe infection: amphotericin B
- Meningitis: fluconazole, ?intrathecal amphotericin
- Lifelong secondary prophylaxis if meningitis; can discontinue in other cases if CD4 >250 cells/uL

OPHTHALMOLOGIC INFECTIONS

Physical Examination

Cytomegalovirus

- CMV:
  - CMV is a member of the herpesvirus group
  - Found universally throughout all geographic locations and socioeconomic groups
  - Infects between 50% and 85% of adults in the United States by 40 years of age
  - Typically remains dormant within the body
  - Invasive disease in HIV+ patients usually occur with severe immunosuppression (CD4 < 50 cells/uL)

CMV

Host	Presentation
Immunocompetent	Heterophile negative mononucleosis syndrome
Immunocompromised	Retinitis Hepatitis Pneumonitis Gastritis Esophagitis Polyradiculopathy Myelitis

CMV Retinitis

- Commonly present with visual field loss, decreased visual acuity, floaters
- Characteristic perivascular granular white retinal infiltrates associated with retinal hemorrhage

Gastrointestinal Infections

- May involve mouth, esophagus, stomach, colon, biliary tract and pancreas
- Patients may present with odynophagia, diarrhea/fever, colonic perforation, rarely mass lesions

Central Nervous System Infections

- Encephalitis
  - Subacute (3-4 weeks) progressive disorientation, confusion, CN palsies, nystagmus
  - MRI shows periventricular enhancement, diffuse white matter changes
  - Diagnosed with CMV PCR in CSF

Central Nervous System Infections

- CMV polyradiculopathy
  - Progressive subacute flaccid paralysis of lower extremities
  - Associated with pain, parasthesias, sphincter dysfunction
  - Characteristic CSF: elevated protein, low glucose, PMNs

Hematologic Effects of CMV

- Neutropenia
- Thrombocytopenia
- Hemolytic anemia

CMV Pneumonia?

- Rare in the HIV population
- Usually reactivation in the setting of a primary pathogen (e.g. PJP)
- Invasive disease uncommon, but positive CMV PCR in BAL not uncommon

Cytomegalovirus as Cause of Fever of Unknown Origin in HIV

- Thought to account for 11% in retrospective case series
- In one series, thought to account for 5% of prolonged, undifferentiated fever
- Another series found <1% of patients without another cause for fever
- Often difficult to determine whether fever caused by CMV reactivation

Armstong W. CID 1999; 28: 341-5. Mayo J. Scand J Infect Dis 1997; 29 (4): 327-36. Miralles P. CID. 1995; 20: 875-9.

Laboratory Diagnosis

- Culture
- Monoclonal antibody testing against CMV matrix protein pp65
- **CMV DNA** or RNA testing
  - PCR
  - Labeled viral nucleic acid probes
  - Nucleic acid hybridization
- Histopathology

Diagnosis of CMV End-Organ Disease

- Relies on combination of clinical symptoms and histological findings from tissue biopsy and/or appearance
- Characteristic intranuclear and intracytoplasm inclusion bodies in infected cells (owl's eye)
- Positive CMV PCR does not equal invasive disease

CMV PCR and pp65

- Can predict development of end-organ disease as well as survival in patients
- However, a positive CMV PCR does not mean that the patient has invasive disease
- Need to obtain eye exam and evaluate for colitis in HIV+ patients with CMV viremia
- Alternately, it is possible to have invasive disease without a positive serum CMV PCR

The Controversy

- Does treatment of asymptomatic viremia in HIV patients prevent invasive disease?
- From the transplant perspective, treating asymptomatic CMV viremia can reduce mortality
- Literature for HIV+ patients in the HAART era suggests that prophylaxis is unlikely to provide benefit

CMV Treatment

- Ganciclovir
  - Nucleoside analogue that inhibits DNA synthesis
  - Major adverse effects of are neutropenia (extremely common) and thrombocytopenia
    - There is a “Neupogen protocol” at Amelia Court where patients can have weekly lab draws and receive filgrastim for CMV-related neutropenia through pharmacy
  - Valganciclovir is the prodrug for ganciclovir
    - Absolute oral bioavailability is approximately 60%
    - FDA approved for Rx of non-sight threatening CMV retinitis
  - Standard protocol is for 21 days

CMV Retinitis

- Intravitreal ganciclovir and foscarnet injections
- Intravitreal ganciclovir implants no longer available

Resistant CMV

- Foscarnet
  - Renal insufficiency common (50%)
  - Electrolyte disturbances (calcium, magnesium, potassium, phosphorus)
  - Cost and shortages ($15-20000)
- Cidofovir
  - Renal insufficiency common, proteinuria an early sign
  - Bone marrow suppression
  - Cost ($15-20000)

Secondary Prophylaxis

- For retinitis, recommended to continue 900 mg/day valganciclovir until CD4 >100 cells/uL
- For colitis, secondary prophylaxis not recommended unless recurrent or severe episode

Acute Retinal Necrosis

- Relatively sudden onset of red eye, periorbital pain, vision loss
- May have uveitis, iritis, vitreitis, occlusive retinal vasculitis
- Necrosis with discrete borders in retinal periphery, circumferential spread

Diagnosis

- Viral culture
- HSV DNA PCR
- Serology not usually helpful

Treatment

- ARN: IV acyclovir + intravitreous foscarnet, vitrectomy, laser, ?steroids
- Resistant herpes: foscarnet, cidofovir

Progressive Outer Retinal Necrosis (PORN)

- Occurs in patients with CD4 <100 cells/uL
- Minimal inflammation
- Multiple discrete peripheral lesions in outer retinal layer
- Rapid coalesence and full thickness retinal necrosis

PORN

- Usually caused by varicella zoster virus
- Rapid onset with rapid progression
- Poor prognosis

Diagnosis

- Clinical appearance
- Culture, DFA, PCR
- Histopathology

Treatment

- For PORN:
  - IV ganciclovir + foscarnet + intravitreal ganciclovir/foscarnet
  - IV acyclovir + intravitreal foscarnet + ganciclovir ocular implant

DERMATOLOGIC MANIFESTATIONS

Kaposi sarcoma

- Skin lesions
- Oral lesions
- Disseminated disease to GI tract and lungs

Human Herpesvirus-8 Disease

- Highest prevalence in MSM, sub-Saharan Africa
- Associated with Kaposi sarcoma, primary effusion lymphoma, multicentric Castleman disease (angiofollicular lymph node hyperplasia)
- Usually occur when CD4 <200 cells/uL but can occur at higher CD4

Lymphoproliferative Disorders

- Primary effusion lymphoma: usually presents with pleural, pericardial or abdominal effusion
- Multicentric Castleman: generalized lymphadenopathy, fever, peripheral neuropathy. Can try antiviral therapy for this

Diagnosis

- Screening for HHV-8 by PCR in peripheral blood *not* indicated
- Biopsy

Treatment of Kaposi sarcoma

- Institution of HAART alone often results in regression of lesions
- For small localized lesions, surgical excision, alitretinoin gel
- Local radiation
- Intralesional vincristine
- For disseminated disease, doxorubicin, paclitaxol, ?sirolimus
- Interferon-alpha

Bartonella

- Can cause cat scratch disease, retinitis, trench fever, endocarditis, **bacillary angiomatosis, bacillary peliosis**
- *B. quintana* (associated with with body louse exposure) and *B.henselae* (associated with cat exposure)
- Occurs when CD4 < 50 cells/uL

Clinical Manifestations

- Lesions can develop in any organ system
- Usually febrile, night sweats, weight loss
- Cutaneous lesions common
- Can cause subcutaneous nodules
- Osteomyelitis with *B.quintana*

Bacillary Peliosis Hepatis

- Multiple blood filled cavities throughout liver
- Usually asymptomatic but if severe can cause liver abnormalities, hemoperitoneum
- Occurs only with *B.henselae*

Diagnosis

- Histopathology of skin lesion
  - Modified silver stain (Warthin-Starry)
- Serology (~75% sensitivity)
- Culture
- PCR

Treatment

- Erythromycin/azithromycin + doxycycline for > 3 months
- Add rifamicin if severe infection
- Endocarditis: doxycycline + gentamicin
- No primary prophylaxis recommended
- No secondary prophylaxis recommended unless relapsing disease (doxycycline or macrolide)

DIARRHEA IN AIDS

Diarrhea in HIV+

- Evaluation for acute diarrhea similar to that for non-immunocompromised (stool culture, *C. difficile* toxins, ova/parasite)
- CMV PCR
- For chronic diarrhea, also send *Cryptosporidium* and *Giardia* antigens, *Microsporidia* stain (modified trichrome); consider medication-induced diarrhea
- May need endoscopy if diagnosis unclear

Cryptosporidium and *Microsporidia* spp.

- Cause chronic, watery, copious diarhea
- May cause cholangiopathy
- Diagnosis with ova/parasite exam, antigen test for *Cryptosporidium*
- Relatively refractory to treatment: need urgent consideration for HAART
- Strong anti-diarrheals indicated
- Can try nitazoxanide 100 mg PO BID x 2-4 weeks for cryptosporidiosis, albendazole 400 mg PO BID x 3 weeks for microsporidiosis

Questions?

- Call Amelia Court 214-590-2865 or 214-590-4418, or page me (214-786-5293) with questions