Week 1…

What factors would you consider when selecting a protease inhibitor for a patient with HIV who has experienced treatment failure with other antiretroviral drugs?

- PIs are active against both HIV 1 and HIV 2.

- When used in combination with NRTIs, they can reduce viral load to a level that is undetectable with current assays

- As with other antiretroviral drugs, HIV resistance can be a significant problem.

- Mutant strains of HIV that are resistant to one PI are likely to be cross-resistant to other PIs.

- To reduce the risk for resistance, PI should never be used alone; rather they should always be combined with at least one reverse transcriptase inhibitors and preferably two.

How would you adjust the antifungal therapy for an older adult patient with a fungal infection and a history of altered gastric pH?

- Drugs like antacids, Histamine-2 antagonists and PPI can greatly reduce absorption of itraconazole.

- These agents should be administered at least one hour before itraconazole or two hours after.

- Because PPI have prolonged duration of action, patient using these drugs may have insufficient stomach acid for itraconazole absorption, regardless of when PPI is given.

How would you determine the appropriate use of acyclovir in a patient presenting with shingles?

- High dose of oral acyclovir are effective for herpes zoster (shingles) in older adults. – 800mg five times daily 7-10 days

- Oral therapy is also effective for varicella (chickenpox) in children, adolescents, and adults provided that dosing begun 24 hours of rash onset

- IV acyclovir is the treatment of choice for VZV infection in the immunocompromised host. – 10-15mg/kg IV q 8h until there are no new lesions, then change to oral therapy.

What would be your considerations for dosing acyclovir in a patient with renal impairment?

- Reduced dosing in patients with impaired renal function

- With IV acyclovir, to reduce the risk of renal injury and neurologic toxicity, ensure adequate hydration before beginning IV therapy with acyclovir

In a patient presenting with flu-like symptoms, how would you decide on the appropriateness of prescribing oseltamivir based on symptom onset and clinical presentation?

- When used for treatment, dosing must begin early – ideally no later than 2 days after symptom onset and preferably much sooner because benefits decline greatly when treatment is delayed.
- When treatment is started within 12 hours of symptom onset, symptom duration is reduced by more than 3 days
- When started within 24 hours – symptom duration is reduced by less than 2 days
- When started within 36 hours – symptom duration is reduced by only 29 hours
- Candidates for prophylactic therapy include family members of someone with flu and residents of nursing home
- To protect family members, dosing should begin within 48 hrs of exposure to and should continue for 10 days
- To protect the residents of nursing homes or high risk members of the community at large, dosing can be done continuously for up to 42 days

What factors would influence your choice of an NRTI in a treatment-naïve patient starting antiretroviral therapy?

- The NRTIs are effective against both HIV-1 and HIV 2 however their activity is greater for HIV 1. The NRTI are ineffective as monotherapy because resistance develops rapidly.
- First line antiretroviral regimens include two NRTIs and one other drug and the availability of combination antiretroviral products has simplified treatment.

How would you select the appropriate route of administration for amphotericin B in a patient with disseminated cryptococcosis?

- Amphotericin B is a polyene antibiotic used to treat systemic mycoses. Treating these types of fungal infections proves to be difficult due to the increased likelihood of resistance to treatment requiring prolonged therapy. Amphotericin is the drug of choice for treating most systemic mycoses but is highly nephrotoxic. Careful consideration should be made when deciding to initiate this medication for treatment. There is one conventional formulation (amphotericin B deoxycholate) and three lipid-based formulations available. All formulations are equally effective in treatment, but the lipid- based formulations are less toxic, however far more expensive than the conventional formulation.
- A patient with disseminated cryptococcosis will need to be treated for systemic mycoses by administering intravenous (IV) infusion daily or every other day for prolonged therapy ranging from 6-8 weeks to 3-4 months depending on the severity of the fungal infection.

How would you manage the administration of amphotericin B in a patient with HIV and a systemic fungal infection to minimize potential adverse effects?

- Amphotericin can cause variety of serious adverse effect. Infusion reactions – fever, chills, nausea and headache. 1-3 hours after starting infusion and persist for about 1 hour. Mild reaction can be reduced by pretreatment with diphenhydramine plus acetaminophen. If other measures fail, hydrocortisone can be use. Phelibitis – change IV site often. Large IV and pretreatment with heparin.
- Nephrotoxicity – kidney damage can be minimized by infusing 1L of saline on days amphotericin is given. Test kidney function every 3 to 4 days, intake and output should be monitored. If plasma creatinine rises above 3.5mg/dL, amphotericin dosage should be reduced.

How would you adjust the dosage of warfarin in a patient who has been newly prescribed itraconazole?

- In patients taking warfarin, prothrombin time should be monitored. Avoid use with drugs metabolized by CYP3A4. Itraconazole inhibits CYP3A4, thus increase levels of many drugs.

How would you monitor liver function in a patient receiving caspofungin therapy, and what would prompt you to alter the treatment plan?

- Combining caspofungin with cyclosporine (sandimune, others) increases the risk for liver injury, as evidenced by transient elevation in plasma levels of liver enzyme. The combination should be avoided.
- Instruct patients to report signs of liver dysfunction.
- Liver function tests should be done at initiation and during use to monitor for hepatic dysfunction.

In a patient with severe or recurrent tinea pedis, how would you decide whether to initiate systemic antifungal therapy?

If a child with tinea capitis is not responding to griseofulvin, what alternative treatments would you consider and why?

- Tinea capitis is difficult to treat. Topical drugs are not likely to work. Oral griseofulvin, taken 6-8 weeks, is considered standard therapy. However, oral terbinafine, taken for only 2 to 4 weeks may be more effective

How would you explain to a patient the importance of adhering to albendazole therapy for the complete eradication of intestinal parasites?

In selecting maraviroc for a patient with HIV, what factors would you consider regarding the patient's viral tropism and resistance profile?

- Maraviroc is not usually used for initial treatment of HIV. It appears most effective in treating patients with drug resistant HIV.
- Maraviroc is indicated for combined use with other antiretroviral agents to treat patients age 16 and older who are infected with CCR5 tropic HIV -1 strains.
- The drug was originally approved only for treatment-experienced patients but is now approved for treatment-naïve patients as well.
- Before maraviroc is used, a test must be performed to confirm that the infecting HIV strain is CCR5 tropic.

How would you address a patient's concerns about dizziness and insomnia while taking an INSTI for HIV treatment, and what alternatives might you consider if symptoms persist?

How would you monitor and manage a patient on protease inhibitors who presents with signs of lipodystrophy?

- Use of protease inhibitors has been associated with redistribution of body fat, sometimes referred to as lipodystrophy syndrome or pseudo cushing syndrome.
- Fat accumulates in the abdomen, breast and between shoulder blades
- Fat is lost from face, arms, buttocks, and legs
- Health risks of the syndrome are unknown, although it can be psychologically distressing
- Drug withdrawal may cause symptoms to resolve but it is not recommended.

In a patient newly diagnosed with HIV, what considerations would lead you to prescribe an INSTI as part of their antiretroviral therapy?

- Integrase strand transfer inhibitors target HIV by terminating the integration of HIV into DNA. Integrase is one of three viral enzymes needed for HIV replication
- By inhibiting integrase, these drugs prevent insertion of HIV DNA and thereby stop HIV replication.
- Integrase inhibitors are combined with other antiretroviral agents to treat adults infected wit HIV-1
- Raltegravir – considered first choice drug for HIV treatment

If a patient with onychomycosis has not responded to topical treatments, how would you assess their suitability for oral terbinafine therapy?

- Terbinafine belongs to same chemical family as naftifine and has same mechanism of action: inhibition of squalene epoxidase with resultant inhibition of egosterol systhesis
- This drug is HIGHLY ACTIVE against dermatophytes and less active against Candida species
- Topical- ringworm (tinea corporis, tinea cruris, tinea pedis)
- Oral – ringworm and onychomycosis
- Onychomycosis is difficult to eradicate and requires prolonged treatment. Infections may be caused by dermatophytes or candida species
- The cure rate is relatively low about 50%
- Treatment generally last at least 3-6 months

How would you alter the treatment plan for a patient with recurrent herpes simplex virus infections who is suspected of having acyclovir-resistant strains?

- -Acyclovir-resistant HSV usually respond to intravenous foscarnet or cidofovir, which are primarily used for treatment of CMV infection.

How would you counsel a pregnant patient who is concerned about receiving the inactivated influenza vaccine?

- Pregnant women are considered a high risk for flu complications in receiving a live attenuated influenza vaccine (LAIV) because LAIV have not been evaluated for its safety with this population. According to Rosenthal, L., & Burchum, J., current recommendations have one contraindication, namely a severe allergic reaction to influenza vaccine or a vaccine component (2021). Therefore, they should receive only the inactivated influenza vaccine.

If a patient presents in January and has not yet received the flu vaccine, how would you address their concerns about getting vaccinated later in the season?

- In the United States the influenza “season” begins in November and extends through March or April but it can also start earlier and last later.
- It usually peaks in January or February but this may also vary.
- To ensure full protection, the best time vaccinate is October or November
- **However, for people who missed the best time, vaccinating as late as April may be of benefit**. Influenza vaccine may be given at the same time as other vaccines including pneumococcal vaccine

How would you manage flu vaccination in a patient with a history of severe egg allergy who is concerned about potential reactions?

- There was a great concern for people with hypersensitivity to eggs. The rationale was that vaccines are produced from viruses grown in eggs and hence may contain trace amount of egg proteins. Although FDA labeling continues to warn against giving such vaccines to people with severe egg allergies, recommendations published in the Morbidity and Mortality Weekly Report state that person with a history of egg allergy of any severity may receive any licensed, recommended, and age appropriate influenza vaccine (IIV, RIV4, or LAIV4)
- These recommendations come from following extensive reviews of vaccine usage by people with reported egg allergies demonstrating that this practice is not as risky as tolerated as once believed.

How would you decide whether to prescribe oseltamivir or zanamivir for a patient presenting with early symptoms of influenza?

- Both oseltamivir and zanamivir are approved for influenza prophyaxis and treatment
- Oseltamivir are approved for 1 year of age and older. Zanamivir is approved for treatment for acute uncomplicated influenza in patients at least 7 y/o and for prophylaxis in patients atleast 5 yr old.
- Zanamivir is well tolerated except for patient with lung disease

What role does neuraminidase inhibition play in the antiviral action of oseltamivir?

- The neuraminidase inhibitors are active against influenza A and influenza B. Oseltamivir is an oral drug approved for the prevention and treatment of influenza in patients 1 year of age and older
- Antiviral effects derive from inhibiting neuraminidase, a viral enzyme required for replication. As a result of neuraminidase inhibition, newly formed viral particles are unable to bud off from the cytoplasmic membrane of infected host cells. Hence, viral spread is stopped.

If a patient with COPD requires antiviral therapy for influenza, how would you manage their treatment to avoid the risks associated with zanamivir?

- In patients with pre-existing lung disorders (asthma, COPD) zanamivir may cause severe bronchospasm and respiratory decline.
- Some patients have required immediate treatment or hospitalization.
- Deaths have occurred
- However, given the effect of flu itself on lung function, it is not clear that zanamivir was the cause
- Nonetheless, owing the potential risk, zanamivir is not RECOMMENDED for patients with underlying airway disease.

How would you determine the appropriateness of palivizumab prophylaxis in a premature infant with a history of respiratory complications?

- Palivizumab is a monoclonal antibody indicated for preventing RSV infection in premature infants and in young children with chronic lung disease
- The antibody binds to a surface protein on RSV and thereby prevents replication
- Dosing should commence before the RSV season (December- march) and continue until the season ends
- acute hypersensitivity reactions have occurred with initial drug use and wit subsequent use.
- anaphylaxis - very rare
- mild anaphylaxis – use with caution
- - severe reaction – drug should be stopped and never use again – give epi and supportive care

How would you monitor a patient on NRTIs for early signs of lactic acidosis, and what would be your approach to managing this complication?

- A major consequence of mitochondrial impairment is lactic acidosis
- Lactic acid accumulate because of dysfunctional mitochondria cannot break down lacyic acid
- Symptoms: Nausea, malaise, fatigue, anorexia and hyperventilation (blowing off carbon dioxide can reduce acidosis)
- Left untreated, the syndrome can be fatal.
- Diagnosis is based on lactic acid measurement in arterial blood.
- - Black box warning is required