American College of Clinical Pharmacy

Updates in Therapeutics® 2012:
Ambulatory Care Pharmacy Preparatory Review and Recertification Course

Dermatology & HEENT
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Conflict of Interest Disclosures

None

Learning Objectives

- Determine when patients with acne should add oral therapy to their topical therapeutic agents using a treatment algorithm.
- Effectively educate a patient on an infestation and the purpose, proper use, and potential adverse reactions of the first-line treatment options for scabies and/or lice.
- Recommend single or multiple topical agents for treating plaque psoriasis given the patient's disease presentation, severity, and (if applicable) previously used therapies.

Page 2-2

Acne

- Types of Acneform Presentation
  - Acne conglobata – Inflammatory cysts
  - Acne mechanica – Lesions in areas of friction
  - Acne rosacea – Erythema & telangiectasias
  - Comedogenic acne – comedones (no inflammation)
  - Common acne – Pustules & comedones
  - Cystic acne – Cysts with infection (poss. scarring)

Page 2-4

Acne

- Medication-Induced
  - Anabolic steroids
  - Azathioprine
  - Corticosteroids
  - Cyclosporine
  - Isoniazid
  - Lithium
  - Phenytoin
  - Progestins
  - Tetracycline
  - Vitamin B_1, B_6, B_{12}

Page 2-4

Patient Case 1

D.M. is a 17-year-old adolescent boy with inflammatory nodular acne on his face, shoulders, and back that becomes increasingly irritated during football season secondary to friction from his helmet strap and shoulder pads. His current acne medications include an oral antibiotic, topical retinoid, and benzoyl peroxide…

Page 2-9

Acne

- Severity Classification

Classification	Criteria
Mild	less than 20 comedones, less than 15 inflammatory lesions, or less than 30 lesions (total)
Moderate	20–100 comedones, 15–50 inflammatory lesions, or a total lesion count of 30–125
Severe	Greater than 5 cysts, greater than 100 comedones, greater than 50 inflammatory lesions, or greater than 125 lesions (total)

Page 2-5

Acne

- Goals of therapy
  - Controlling acne lesions
  - Preventing scarring
  - Minimizing morbidity (significant infections)
- Reasonable treatment goals should be set and discussed with the patient prior to starting therapy

Acne

- Non-pharmacologic interventions
  - Avoid popping pimples
  - Wash face with a non-comedogenic soap
  - Sunlight exposure
  - Dietary modifications have not proved effective to reduce acne
    - Chocolate
    - Fatty foods
  - Caution regarding photosensitivity with all agents (at least SPF 15)

Page 2-4

Acne

Treatment Recommendations

	Mild		Moderate		Severe
	Comedonal	*Papular/ Pustular*	*Papular/ Pustular*	*Nodular*	*Nodular/ Conglobate*
First choice	TR	TR + TA	OA + TR ± BPO	OA + TR + BPO	OI
Alternatives	TR *or* AA *or* SA	TR + TA *or* AA	OA + TR ± BPO	OI *or* OA + TR + BPA/AA	High-dose OA + TR + BPO
Alternatives for females	[See First Choice]	[See First Choice]	OAAn + TR/AA ± TA	OAAn + TR ± OA ± TA	High-dose OAAn + TR ± TA
Maintenance	TR		TR ± BPO		

Figure 1. Acne treatment algorithm.

AA = azelaic acid; BPO = benzoyl peroxide; OA = oral antibiotic; OAAn = oral antiandrogenic; OI = oral isotretinoin; SA = salicylic acid; TA = topical antimicrobial; TR = topical retinoid.
Reprinted with permission from: J Am Acad Dermatol 2005;49(1 Suppl):S1–S37.
Additional graphical algorithm available in: Eur J Dermatol 2006;16:565–71.

Page 2-5

Patient Case 1

…He is beginning to develop scarring because of this irritation and would like something new. Which one of the following is the best alternative regimen for the patient to try?

- ☐ Oral isotretinoin.
- ☐ Topical retinoid plus azelaic acid.
- ☐ Oral antiandrogen (drospirenone).
- ☐ Topical retinoid plus topical antibiotic.

Page 2-9
Answer 2-47

Acne

- Topical Retinoids
  - Reduces the presence of mild-to-moderate acne
  - Recommended as first-line treatment for most types/severities of acne
  - May take up to 3 months to see a clinically significant difference
  - Safety Concerns & Adverse Reactions
    - Photosensitivity
    - Skin irritation
    - Pregnancy Category X

Page 2-5

Acne

- Topical Antimicrobials
  - May be used in all classifications/severities of acne as add-on therapy to the primary or alternative regimens
  - Typically used in addition to a topical retinoin or as a combination product with benzoyl peroxide
  - Additive to adverse effects of topical acne medications:
    - Dry skin
    - Erythema
    - Itching
    - Scaling/Peeling

Page 2-6

Acne

- Benzoyl Peroxide
  - Introduce as add-on therapy for moderate-to-severe acne
  - Should be used in combination with topical and/or oral antibiotics because it decreases the chance of antimicrobial resistance
  - Comparable efficacy to oral antibiotics, but without developing bacterial resistance.
  - Higher concentrations (10%) are only minimally more effective with worse adverse reactions

Page 2-6

Acne

- Azelaic Acid
  - Not recommended as a first line agent to treat acne
  - Considered an alternative choice as monotherapy or an add-on for patients with mild-to-moderate acne
  - Same treatment response is seen with once-daily and twice-daily application

Page 2-7

Acne

- Other Topical Agents
  - Dapsone
    - Still undergoing studies that evaluate the long-term efficacy and safety of topical dapsone use
    - Questionable decrease in hemoglobin with use
  - Salicylic Acid
    - Efficacy is comparable to that of benzoyl peroxide (improved when used in combination with other agents)
    - Unlikely to cause salicylate toxicity unless used on a large area of the skin for an extended period of time

Page 2-8

Acne

- Oral Contraceptives
  - Later generation progestins have less androgenic activity
    - Third generation: desogestrel, nogestimate
    - Fourth generation: drospirenone
  - Beneficial for female patients using oral isotretinoin as an oral contraceptive and anticomedogenic drug
  - Increases risk for venous thromboembolism, breast & cervical cancer, and cerebrovascular disease

Page 2-7

Acne

- Oral Antimicrobial
  - Introduced in patients with moderate-to-severe acne
  - AAD recommends that treatment with oral antimicrobials be for limited intervals
  - Minocycline appears most efficacious oral antomicrobial therapy
  - Save erythromycin for patients who are recommended against using tetracyclines
  - Be cautious of bone-related adverse events in children younger than 8 and fetal/infant toxicity

Page 2-9

Acne

- Oral Isotretinoin
  - Reserved for patients with severe nodular (±conglobate) acne
    - Treatment resistant acne
    - Acne that results in physical or psychological scarring
  - Treatment duration is typically 15 to 20 weeks
    - Discontinue sooner if >70% reduction in lesions
  - Requires monthly monitoring for neurologic, ophthalmologic, gastrointestinal, and metabolic changes

Page 2-10

Acne

- Oral Isotretinoin
  - Caution against arthralgias, myalgias, and excessive skin or mucus membrane drying
  - Multiple safety concerns
    - Highly teratogenic (iPledge Program)
    - Suicidal ideations
    - Pancreatitis
    - Pseudotumor cerebrii

Page 2-10

Acne

- iPledge Program
  - Creates a single resource to create a "verifiable link between the negative pregnancy test and the dispensing of the isotretinoin…"
  - Requires monthly provider documentation that a patient has been counseled on the risks of isotretinoin therapy
  - Before starting therapy, iPledge requires two consecutive blood or urine tests to be negative for pregnancy.
  - Patients commit to using two forms of contraception 1 month before, throughout, and 1 month after therapy
  - Documented online monthly

Page 2-10

Acne

Treatment Recommendations

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Patient Case 1

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Page 2-9
Answer 2-45

Infestations: Scabies

- Irritating, allergic reaction to a mite (*Sarcoptes scabiei*) that burrows under the skin
- Transferred with person-to-person contact
  - Dense living communities
  - Hospitals, nursing homes, schools
- Types of Scabies:
  - Common Scabies
  - Norwegian (crusted) scabies
  - Nodular scabies

Page 2-16

Infestations: Scabies

- Symptoms
  - May take 3–6 weeks after initial infestation to present with common symptoms
- Symptoms may be:
  - Worse during evening hours and while sleeping
  - Worsen for 1–2 days after starting treatment
  - Persist for up to 1 week after resolving infestation

Page 2-16

Infestations: Scabies

Abdomen
Areola and nipples
Axillary folds
Elbows
Finger webs
Flexor of wrists
Lower buttocks
Penis
Under breasts

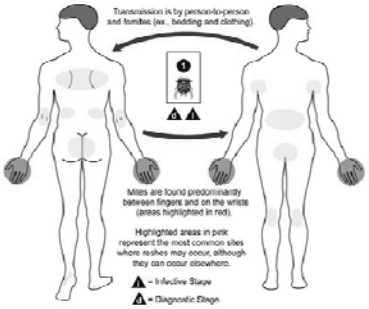

Image from the U.S. Center for Disease Control & Prevention
http://dpd.cdc.gov/dpdx/html/Scabies.htm

Page 2-17

Patient Case 3

- P.F. is a 26-year-old mother of two children (6 and 8 years old), who have contracted scabies after spending the night at a neighborhood friend's house. They developed symptoms about 2 weeks after exposure, and the family's primary care provider gave them a prescription for permethrin 5%. Unfortunately, permethrin did not eradicate the infestation, and the symptoms recurred 1 month later…

Page 2-17

Patient Case 3

…Which one of the following factors is the most likely cause of the treatment failure?

- Increasing resistance patterns for scabies in the United States.
- The prescriber ordering an inappropriate dose of permethrin for the children (pediculosis dose).
- Not applying permethrin to areas such as the soles of feet or unexposed areas.
- Not evaluating infested/symptomatic areas and removing nits (eggs).

Page 2-17
Answer 2-45

Infestations: Scabies

- Non-pharmacologic Interventions
  - Evaluation of all close contacts within the past 30 days for symptoms of infestation
  - Identify all items in contact with the infested person for the past 72 hours.
    - Decontaminate all bedding, clothing, and toys using machine washer (at least 140°F water) and heated dryer.
    - Isolate items that cannot be put in a machine washer using an insecticide powder and sealed plastic bag for 48–72 hours.

Page 2-17

Infestations: Scabies

- Non-pharmacologic Interventions
  - In hospital or nursing home situations:
    - Isolate infested patients (may require prolonged isolation to ensure eradication).
    - Provide education and therapy for family, staff, and residents in contact with person.
  - May require treatment of the entire at-risk population
  - Remove infested children from school until infestation is adequately treated.

Page 2-17

Infestations: Scabies

- Treatment Recommendations

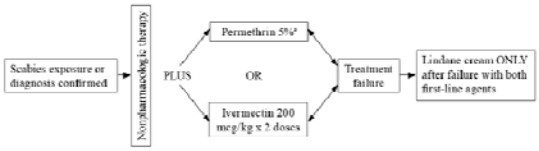

Figure 3. Scabies treatment algorithm.
*Primary choice.

Page 2-18

Infestations: Scabies

- Permethrin 5%
  - Most effective agent and first-line recommendation from the American Academy of Pediatrics
  - The 5% cream is to treat scabies and the 1% cream is to treat head lice
  - Patients should apply all over their body (below the head) and leave on for 8 to 14 hours
  - May cause skin irritation, erythema, or numbness
  - May worsen symptoms or cause an asthma exacerbation

Page 2-18

Infestations: Scabies

- Ivermectin
  - Appears to be less effective than permethrin, but still an option for first-line to eradicate scabies
  - Not FDA approved for treatment, but endorsed by the CDC as a treatment option
  - Oral option for patients who cannot use permethrin
  - Serious adverse events:
    - Symptomatic postural hypotension
    - Associated with an increased 6-month mortality when used in long-term care residents

Page 2-18

Infestations: Scabies

- Lindane
  - Third-line option for patients who have failed treatment (or cannot tolerate) permethrin and ivermectin
  - Warnings:
    - Increased risk of seizures and death with repeated or prolonged exposure
  - Precautions:
    - Do not leave on skin for greater than 12 hours
    - Avoid any skin-to-mouth contact during application
    - Do not retreat if the infestation is not completely eradicated

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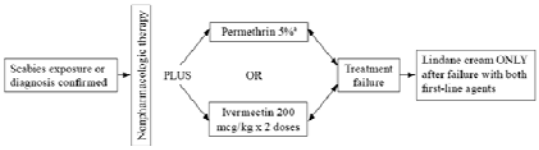
Infestations: Scabies

- Treatment Recommendations



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- Not evaluating infested/symptomatic areas and removing nits (eggs).

Page 2-17
Answer 2-45

Infestations: Lice

- Classification
  - Pediculus capitis: head lice
  - Pediculus corporis: body lice
  - Phthirus pubis: pubic lice
- Symptoms & Clinical Findings
  - Rash
  - Malaise
  - Headache
  - Nits (eggs) at the base of hair follicles

Page 2-19

Infestations: Lice

- Non-pharmacologic
  - Nit removal using a fine-tooth comb
  - Comb starting from the scalp to the end of the hair follicle and repeat every 2-3 days until no eggs are found
  - Machine wash linens and seal unwashable items in a plastic bag for 14 day
- AAP does not recommend removing students from school

Page 2-20

Infestations: Lice

- Treatment Recommendations

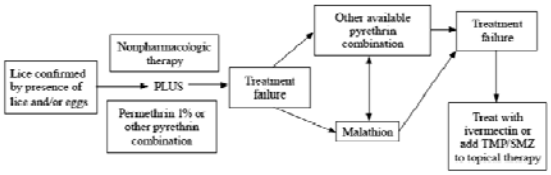

Figure 4. Lice treatment algorithm.
*Lindane no longer recommended.
**Spinosad not included in treatment recommendations.
TMP/SMZ = trimethoprim/sulfamethoxazole.

Page 2-20

Infestations: Lice

- Pyrethrins
  - Permethrin 1% cream is preferred by American Academy of Pediatrics for treating lice
  - Pyrethrins 0.33% & Piperonyl Butoxide 3-4% may be considered as a first-line alternative
  - Apply to (washed and dried) hair and rinse after 10 minutes
  - May be used as prophylaxis in household contacts and situations with >20% populations involvement

Page 2-21

Infestations: Lice

- Malathion
  - Treatment option for patients older than 24 months who have failed permethrin or when permethrin resistance is suspected
  - Malathion resistance is reported in the United Kindgom, but U.S. formulation does not have same reports (regional data excluded)
  - High isopropyl alcohol content poses issues:
    - Flammable
    - Skin and scalp irritation

Page 2-21

Infestations: Lice

- Spinosad
  - Approved for use in the United States in January 2011
    - Not included in the AAP 2010 treatment recommendations
  - Limited number of clinical trials comparing spinosad to permethrin, but initial data shows spinosad to be superior
  - Avoid use in infants less than 6 months old secondary to risk of gasping syndrome (benzyl alcohol)

Page 2-21

Infestations: Lice

- Ivermectin
- Sulfamethoxazole/Trimethoprim
  - Used in addition to permethrim 1% for treatment-resistant infestations where nits and lice are found 2 weeks after initial therapy
  - Less expensive alternative than ivermectin for treatment-resistant infestations

Page 2-22

Infestations: Lice

- Suffocation-Based Pediculocides
  - Apply petrolatum shampoo to scalp, dry with a hair dryer, leave on overnight, and wash out in the morning
  - Requires manual removal of all lice and nits with a fine-tooth comb
  - Must thoroughly wash hair for 7 to 10 days to remove the petrolatum residue

Page 2-22

Infestations: Lice

- Treatment Recommendations

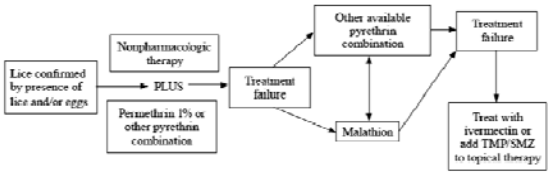

Figure 4. Lice treatment algorithm.
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TMP/SMZ = trimethoprim/sulfamethoxazole.

Page 2-20

Patient Case 7

J.W. presents to his primary care provider's office for his annual physical examination. He is a 25-year-old man with past medical history significant for bipolar disease with rapid cycling. His medications include quetiapine, valproic acid, sertraline, and lithium. Today, he presents with new itchy and painful skin lesions on his knees. He was involved in a car accident about 12 months ago, which resulted in several contusions on his upper legs from impact with the dashboard. Since then, lesions have developed, and he asks his primary care providers to identify them.

Page 2-30

Patient Case 7

The patient is given a diagnosis of psoriasis, and the provider thinks that the patient's mental health agents may be contributing to the development of these lesions. Which one of the following agents is most likely causing the psoriatic lesions?

- Quetiapine.
- Valproate.
- Sertraline.
- Lithium.

Page 2-30
Answer 2-45

Psoriasis

- Types of Psoriasis
  - Plaque psoriasis is most common (80% of cases)
  - Pustular psoriasis, Guttate psoriasis, and Erythrodermic psoriasis
- Risk Factors
  - Genetics
  - Skin trauma
  - Smoking
  - Medications – (N)SAIDs, (A)CE inhibitors, (I)nderal, (L)ithium, (S)alicylates

Page 2-30

Patient Case 7

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- ☐ Valproate.
- ☐ Sertraline.
- ☐ Lithium.

Page 2-30
Answer 2-45

Psoriasis

- Clinical Presentation
  - Skin lesions that are itching and/or painful
  - Silvery scales, symmetric, red lesions:
    - Arms & legs
    - Buttocks
    - Genitals
    - Palms & Soles
    - Scalp
    - Trunk
  - PASI – Psoriasis Area and Severity Index

Page 2-31

Psoriasis

- Severity Classification

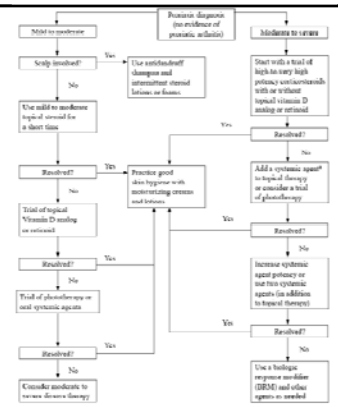
Classification	Criteria
Mild	Less than 3% of the body
Moderate	3 to 10% of the body
Severe	Greater than 10% of the body

Page 2-31

Psoriasis

- Non-Pharmacologic Interventions
  - Moisturizers
  - Ultraviolet radiation (UVA or UVB) for psoriasis that does not respond to topical treatments
  - Smoking cessation
  - Saline spa water therapy (limited efficacy)

Page 2-31



Page 2-32

Psoriasis

- General rules for pharmacotherapy
  - Topical agents are first choice for mild-to-moderate disease
  - Systemic therapy may be necessary for severe and/or extensive disease or those who do not respond to topical therapy
  - Medication vehicle may affect efficacy and potency
    - Ointments increase medication delivery & absorption
    - Foams, shampoos, gels, and sprays may be best for hairy areas
    - Creams are ideal for daytime application
    - Ointments are ideal for night because of cosmetic shine

Page 2-33

Psoriasis

- Topical Corticosteroids
  - First-line treatment option for patients with mild-to-moderate disease
  - Equivalent efficacy to Vitamin D analogs, but with fewer adverse events
  - As therapy continues, gradually decrease steroid dose and potency to identify the least efficacious dose
  - Be aware of skin atrophy and/or dermatologic infections with long-term use

Page 2-34

Psoriasis

- Vitamin D analogs
  - Recommend use in combination with topical corticosteroids
  - Area of application should not exceed 30% of the patient's body surface area
  - Risk of hypercalcemia with use of greater than 100 grams per week
  - Counsel patients about photosensitivity and an increased risk of UV-induced skin tumors

Page 2-34

Psoriasis

- Topical Retinoids
  - Used in combination with topical corticosteroids in all severity of disease
  - Dermatologic irritation of topical retinoids may be attenuated with the use of topical corticosteroids
  - Photosensitivity and increased sensitivity to environmental factors (heat, cold, wind, etc)
  - Pregnancy category X

Page 2-34

Psoriasis

- Additional Topical Treatments
  - Salicylic Acid
  - Anthralin
  - Coal Tar
  - Tacrolimus and/or pimecrolimus
  - Moisturizers

Page 2-35

Patient Case (Self-Assessment)

D.T. is a 46-year-old woman with severe and sometimes debilitating psoriasis with arthritis symptoms. She has been dealing with painful psoriatic arthritis complications in her hands, wrists, hips, and knees for the past 6 months and has only limited relief from nonsteroidal anti-inflammatory drugs (NSAIDs) and oral corticosteroids. She underwent a hysterectomy with bilateral salpingo-oophorectomy 4 years ago and has poorly controlled hypertension despite being treated with fosinopril, hydrochlorothiazide, and amlodipine. She is employed and has medical and prescription insurance.

Page 2-3

Patient Case (Self-Assessment)

Which one of the following is the first choice to help lessen D.T.'s symptoms?

- Methotrexate 20 mg once weekly.
- Cyclosporine (equaling 1.25 mg/kg) twice daily.
- Acitretin 50 mg once daily.
- Etanercept 50 mg twice weekly.

Page 2-3
Answer 2-47

Psoriasis

- T-cell Inhibitors
  - Demonstrated improvement in plaque psoriasis
  - Positive quality-of-life outcomes in clinical research
  - Avoid use in patients with HIV, history of malignancy, or active infectioin
  - After 12 weeks of therapy, patients should have a 12 week, treatment-free period

Page 2-35

Psoriasis

- TNF Inhibitors
  - Effective at reducing effects of psoriasis
  - Potential for patients to have less of a response to therapy over time, but this may be countered with co-administration of methotrexate
  - Increased risk of infection, malignancy, and/or cardiac conditions with use
  - Highly effective, but very costly therapeutic interventions

Page 2-36

Psoriasis

- Methotrexate
  - Reserved for use in severe, intractable, and disabling psoriatic symptoms and/or psoriatic arthritis
  - Significantly diminishes ability to generate an immune response
- Cyclosporine
  - Reserved for patients who are refractory to one systemic therapy and unable to use biologic therapy
  - Considered more effective than methotrexate, but with considerably more serious adverse drug reactions

Page 2-37

Psoriasis

- Acitretin
  - Less effective than all other systemic therapies for psoriasis
  - Women should use contraception for 3 years after discontinuing therapy
  - Men and women should avoid donating blood for 3 years after discontinuing therapy

Page 2-38

Patient Case (Self-Assessment)

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Answer 2-47

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Infectious Diseases
Elizabeth A. Coyle, Pharm. D., FCCM, BCPS
University of Houston College of Pharmacy

Conflict of Interest Disclosures

Elizabeth A. Coyle, Pharm.D., FCCM, BCPS – has received research funding from Cubist, and is on the Speakers Bureau for Cubist

Learning Objectives and/or Agenda

- Learning Objectives
  - Be able to design appropriate pharmacologic and nonpharmacologic treatment regimens for various patient populations with urinary tract infections, community-acquired pneumonia, upper respiratory tract infections, skin & soft tissue infections, and sexually transmitted diseases
  - Be able to identify risk factors & clinical circumstances to appropriately design antimicrobial treatment for resistant infections & to prevent resistant infections, and designing a regimen that is appropriate as well as cost effective.

Agenda

- Urinary Tract Infections
- Prostatitis
- Community-acquired Pneumonia
- Upper Respiratory Tract Infections
- Uncomplicated Skin and Soft Tissue Infections
- Sexually Transmitted Diseases

Urinary Tract Infections

JC is a 25 year old female who presents to her doctor's office complaining of dysuria urinary frequency over the past 3 days. She denies fever or flank pain. She is an otherwise healthy female, no history of UTIs and with no known allergies.

Urinalysis reveals:
- hazy urine
- WBC of $10^6/mm^3$
- nitrite positive
- leukocyte esterase positive
- positive protein
- 10^4 CFU/mL gram-negative rods

How would you treat JC's uncomplicated cystitis?

Urinary Tract Infections

- Most common indication for antimicrobials in women of childbearing age.
- Cystitis/Pyelonephritis
  - Cystitis: lower UTIs involving bladder
  - Pyelonephritis: upper UTIs usually involving kidney
- Uncomplicated: Girls ages 15 – 45 years
- Complicated
  - Structural abnormalities
  - Men
  - Pregnancy
  - Children

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Urinary Tract Infections

- Etiology
  - *E. coli* (75 – 95%)
  - Enterobacteriacea
    - *Proteus mirabilis*
    - *Klebsiella pneumoniae*
  - *Staphylococcus saprophyticus*

2-52
CID 2011; 52(5): e103-e120.

Urinary Tract Infections

- Consideration of *E. coli* Resistance
  - Need to be cognizant of local resistant patterns
  - General Resistance Rates
    - Amoxicillin > 20%
    - Trimethoprim/Sulfamethoxazole >20%
    - Fluoroquinolones <10%
    - Amoxicillin-clavulanate, 1st & 2nd generation oral cephalosporins <10%
    - Nitrofurantion & Fosfomycin relatively good in vitro susceptibility

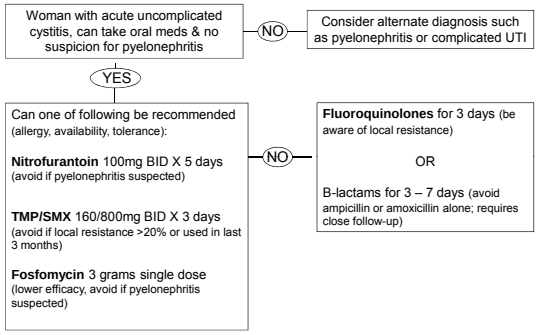
2-54
CID 2011; 52(5): e103-e120.

Treatment Uncomplicated Cystitis

- Trimethoprim/Sulfamethoxazole 160/800 mg BID
  3 day treatment
- Fluoroquinolones
  - Ciprofloxacin 500mg extended release daily or 250mg twice/day
  - Levofloxacin 250mg daily
  3 day treatment
- Nitrofurantion monohydrate 100mg BID
  3 day treatment
- Fosfomycin 3 grams Single dose
- Beta-lactam (Not Amoxicillin)
  3 – 7 day treatment

2-53, 54
CID 2011; 52(5): e103-e120.

IDSA Guideline Treatment Algorithm



Adapted from algorithm in CID 2011; 52(5): e103-e120.

Urinary Tract Infections

- Based off of the 2010 IDSA Guidelines, which of the following is the best option for JC, our 25 year-old, otherwise healthy patient with no known allergies?

A. Levofloxacin 250mg once/day X 3 days
B. Fosfomycin 3 gram X 3 doses
C. Nitrofurantoin macrocrystals 100mg BID X 5 days
D. TMP/SMX 160/800mg X one dose

Urinary Tract Infections

- Recurrent and Relapse infections
  - Recurrent Infections – infecting organism is different than original/preceding infection
    - Risks: sexual intercourse, diaphragm & spermicide use
    - Treatment options
      - Self/administered/initiated therapy at onset of symptoms
      - Postcoital therapy
      - Continuous low-dose prophylaxis (when >3 episodes/year)
      - In postmenopausal women, topical estrogen
  - Relapse Infections – persistence of original infection after treatment
    - May indicate renal involvement, structural abnormality
    - May require longer treatment or use of alternative agent

2-55

Urinary Tract Infections

W.A. is a 50 year-old woman who presents to the clinic with dysuria and increases urinary frequency the last 2 days. This is her fifth UTI in the past 12 months since going through menopause. Otherwise she is in very good health, and her only drug is a multivitamin daily and loratadine as needed for seasonal allergies. She is very concerned about the frequency of her UTIs and would like to know whether there is any way she can prevent these.

2-56

Urinary Tract Infections

- Which of the following is the best advice for W.A.?

A. Drink a glass of cranberry juice daily
B. Daily topical estrogen cream applied vaginally
C. Postcoital voiding after intercourse
D. Nitrofurantoin 100mg orally 2 times/day for 6 months

2-56

Community-acquired Pneumonia

R.C. is a 60-year-old woman who presents to the clinic with a 4-day history of increasing productive cough, malaise, wheezing, and fever. Her medical history includes type 2 diabetes mellitus for 20 years, congestive hear failure, chronic kidney disease, and osteoarthritis. On examination, she is found to have a temperature of 102.3°F, respiratory rate 22, BP 120/78, & HR 90. She is 5'6" tall and weighs 90kg. Her laboratory values are WNL, except SCr 3.0 mg/L & WBC 18/mm^3. A chest radiograph reveals consolidation in the right lower lobe. She is given the diagnosis of CAP.

2-60

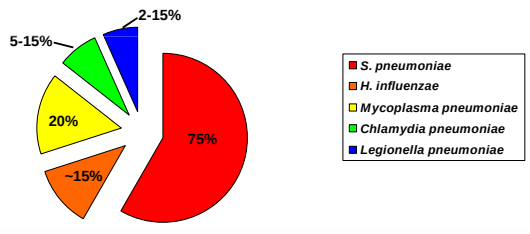
Community-acquired Pneumonia

- Risk factors
  - Age > 65 years
  - Comorbidities (pulmonary, diabetes, CHF, HIV)
  - Smokers
  - Recent Antibiotic Therapy
- Signs and Symptoms
  - Fever
  - Cough with or without sputum
  - Dyspnea, chest pain, wheezing
  - Myalgia, sweats, rigors

2-57

Community-acquired Pneumonia

- Etiology
  - Typical Pathogens *(S. pneumoniae, H. influenzae)*
  - Atypical Pathogens *(M. pneumoniae, C. pneumoniae, Legionella)*



2-58

Community-acquired Pneumonia

- Diagnosis
  - Physical Exam
  - Chest Radiograph
  - Microbiology
    - Not routinely done in outpatient
    - IDSA/ATS 2007 guidelines suggest testing if it will change individual therapy or if previous therapy has failed
  - Scoring Systems
    - Determine if treatment can be in or outpatient treatment
    - CURB-65
    - Pneumonia Severity Index (PSI)

2-58,59

Community-acquired Pneumonia

- Treatment
  - β-lactams do NOT cover atypical pathogens
  - Macrolides, fluoroquinolones, doxycyline cover typical and atypical pathogens
  - Be cognizant of local resistance patterns
    - Penicillin-resistant *S. pneumoniae*
    - Macrolide or fluoroquinolone *S. pneumoniae* resistance
    - Multi-drug *S. pneumoniae* resistance
  - Treatment typically 7 – 10 days

2-59,60

Community-acquired Pneumonia

- Treatment
  - Previously healthy/no antimicrobials last 3 months
    - Macrolide (azithromycin, clarithromycin)
    - Doxycycline
  - Presence of comorbidities, use of antibiotics last 3 months
    - Respiratory fluoroquinolone (levofloxacin, moxifloxacin, gemifloxacin)
    - β-lactam (high-dose amoxicillin, amoxicillin-clavulanate, or cephalosporin (ceftriaxone, cefpodoxime,cefuroxime) PLUS a macrolide

2-59,60

Community-acquired Pneumonia

- Which of the following is the best empiric option for managing R.C.'s CAP?

A. Levofloxacin 750mg orally once daily for 10 days
B. Azithromycin 500mg orally once on day 1; then 250mg orally daily for 4 days
C. Linezolid 600mg orally 2 times/day for 10 days
D. Azithromycin 500mg orally once on day 1, then 250mg orally daily for 4 days plus amoxicillin 500mg orally 2 times/day for 10 days

2-60

Upper Respiratory Tract Infections

- LS is a 35-year-old man who presents to the clinic with a 3-day history of headache, runny nose, nasal congestion, and tooth pain. He is an otherwise healthy man with no allergies or comorbidities. He is given a diagnosis of sinusitis.

2-64

Acute Sinusitis

- Primarily viral
  - Differentiation with bacteria is difficult
  - Viral usually resolve in 7 – 10 days, worsening could be bacterial
    - *S. pneumoniae* & *H. influenzae* 70% bacterial cases
- Signs/Symptoms
  - Nasal discharge and/or congestion
  - Facial, sinus and maxillary tooth pain

2-64

Acute Sinusitis

- Treatment
  - Most sinus infections are self-limiting
  - Supportive Care
    - Nasal or oral decongestants
    - Saline irrigations
    - Avoid antihistamines (dry mucosa)
  - Antimicrobial Therapy (when persist, symptoms worsen, or sinus discharge changes)
    - Amoxicillin first line
    - Others: TMP/SMX, macrolide, 2nd generation cephalosporin, respiratory fluoroquinolone
    - Usually treat 10 -14 days

2-65

Sinusitis

- Which of the following is the best treatment recommendation for L.S.?

A. Loratadine 10mg/day for 10 days
B. Amoxicillin 1g orally 3 times/day for 10 days
C. Azithromycin 500mg orally once on day 1; then 250mg orally daily for 3 days
D. Oxymetazoline 2 sprays in each nostril every 12 hours for 3 days

2-64

Pharyngitis

- TR is a 4-year-old female toddler who presents to the pediatric clinic with a 3-day history of runny nose, sore throat, and fever of 102°F. She lives at home with her mother, father, and 11-year-old brother, and she attends preschool 3 days a week. On physical exam, she weighs 19 kg, and her tonsils are erythematous and inflamed. A throat swab is taken, and her RADT comes back negative for group A streptococcus.

2-66

Pharyngitis

- Viruses are most common cause
- Group A Streptococcus most common bacterial 15-30%
  - 5-15 year olds
  - Parents of school-age children
- Signs/Symptoms
  - Acute sore throat & pain swallowing
  - Fever
  - Erythema & inflamed tonsils with or without exudates
  - Tender/swollen lymph nodes

2-66

Pharyngitis

- Can not determine between viral and bacterial by signs/symptoms
- Diagnosis
  - Throat swab for culture or RADT
    - RADT takes about 15 minutes in clinic
    - Usually symptoms have to have been present for more than 24 hours

2-66

Pharyngitis

- Treatment
  - Supportive Care
    - Pain relief with acetaminophen or NSAIDS
    - Topical analgesics
    - Saltwater gargles
  - Antimicrobials for positive group A streptococcus
    - Will see improvement in 24 – 48 hours
    - Penicillin drug of choice
      - Oral penicillin VK x 10 days or IM PCN benzathine x 1 dose
      - Amoxicillin orally x 10 days
    - Macrolides or 1st generation cephalosporins

2-66,67

Pharyngitis

- Which of the following is the most appropriate treatment recommendation for TR?

A. Penicillin benzathine 0.6million units intramuscularly once
B. Ibuprofen 150mg (7.5mL of 100/5mL of elixir) as needed
C. Acyclovir 380 mg (20mg/kg) orally 4 times/day for 10 days
D. Trimethoprim/sulfamethoxazole 76/380mg (4mg/kg of TMP) orally every 12 hours x 10 days

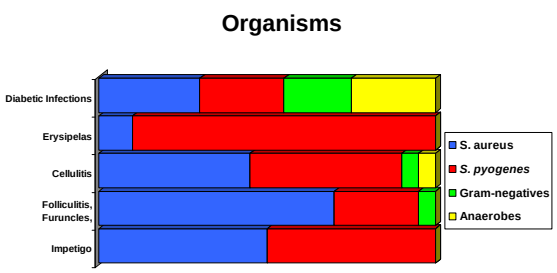
2-66

Uncomplicated Skin & Soft Tissue Infections

- Some of the most common infections seen in community
- Uncomplicated usually involve only the upper layers of skin (Epidermis & Dermis)
- Common Skin Infections
  - Impetigo
  - Folliculitis, Furuncles, and Carbuncles
  - Cellulitis
  - Erysipelas

2-67

Uncomplicated Skin & Soft Tissue Infections



2-67 thru 73

Impetigo

- Superficial infection with discrete purulent lesions
  - Face & Extremities
- Primarily children 2 -5 years old
  - Spread readily with close contact
  - Hot, humid climates
- Treatment for 7 – 10 days
  - Oral antimicrobials (amoxicillin/clavulanate, dicloxacillin, cephalexin, clindamycin)
  - Mupirocin ointment 3 times/day in patients with limited lesions/surface area

2-68,69

Folliculitis, Furuncles, & Carbuncles

- MM is a 16-year-old adolescent girl who presents to the clinic with a 24-hour history of a diffuse, itchy rash in both of her legs. She went to a pool party yesterday, and about 10 hours afterward noticed the development of the rash. She has no other symptoms. MM is an otherwise healthy teenager who takes loratadine as needed for allergies. She currently weighs 55kg. On physical exam, significant findings are a diffuse erythematous papular follicular rash. She is given a diagnosis of folliculitis.

2-69

Folliculitis, Furuncles, & Carbuncles

- Folliculitis
  - Superficial inflammation of hair follicle due to infectious and non-infectious causes
  - Pruritic, erythematous papules within 48hrs of infectious exposure
- Furuncles (abscess or boil)
  - Largely occur in areas of friction or perspiration
  - Firm, tender, red nodule that is painful & usually pus filled
  - Community-acquired MRSA (CA-MRSA) may look like spider bite with necrotic center
- Carbuncles
  - Swollen, red, deep painful masses commonly on back of neck

2-69,70

Folliculitis, Furuncles, & Carbuncles

- Treatment
  - Folliculitis – warm saline compresses
  - Furuncles & Carbuncles – antimicrobials for 7-10 days
    - MSSA and/or *S. pyogenes*
      - Dicloxacillin 250 -500mg PO every 6 hours
      - Cephalexin 250 -500mg PO every 6 hours
      - Clindamycin 300 – 600mg PO every 6-8 hours
    - CA-MRSA
      - Clindamycin (cross-resistant with erythromycin)
      - TMP/SMX 1-2 DS tablets BID
      - Linezolid 600mg PO BID
      - May require IV treatment (vancomycin, daptomycin, tigecycline, telavancin)

2-69,70

Folliculitis, Furuncles, & Carbuncles

- Which of the following is the best recommendation for treatment of MM's folliculitis?

A. TMP/SMX 1 DS tablet PO 2 times/day for 10 days
B. Cephalexin 250 mg PO 4 times/day for 10 days
C. Warm saline compresses
D. Ciprofloxacin 500 mg PO 2 times/day for 10 days

2-69

Cellulitis

- KM is a 32 year-old woman who presents to the clinic with pain, redness, and swelling below her left knee cap. She went to the emergency clinic 2 days ago and was given a prescription for cephalexin, but she states the area keeps getting more painful and red despite the antibiotics. KM is an otherwise healthy woman with no known drug allergies. She works as an elementary teacher and goes to the gym regularly. Physical exam reveals an erythematous and inflamed area with a necrotic center below the left knee cap that is very warm to the touch. KM's vital signs are normal and she is afebrile. I & D are performed in the office, and 15mL of purulent fluid is sent for culture & sensitivities.

2-71

Cellulitis

- Acute, diffuse skin infection of the epidermis & dermis
- Usually proceeded by trauma, wound, etc
- Signs & Symptoms
  - Infected area red, warm and painful to touch
  - Non-elevated lesions with poorly defined margins
  - Tender lymphadenopathy possible
  - Fever, chills, malaise may be present

2-70,71

Cellulitis

- Treatment for 7 to 10 days
  - Target most likely organisms
    - MSSA and/or *S. pyogenes*
      - Dicloxacillin 250 -500mg PO every 6 hours
      - Cephalexin 250 -500mg PO every 6 hours
      - Clindamycin 300 – 600mg PO every 6-8 hours
    - CA-MRSA
      - Clindamycin (cross-resistant with erythromycin)
      - TMP/SMX 1-2 DS tablets BID
      - Linezolid 600mg PO BID
      - May require IV treatment (vancomycin, daptomycin, tigecycline, telavancin)

2-71

Cellulitis

- Which one of the following is the best recommendation for empiric coverage of KM's cellulitis?

A. Penicillin VK 500mg orally every 6hrs for 10 days
B. Vancomycin 1 g IV every 12hrs for 10 days
C. TMP/SMX 1 DS tablet PO 2 times/day for 10 days
D. Dicloxacillin 250mg PO 4 times/day for 10 days

2-71

Erysipelas

- Clinically similar to cellulitis
  - Infection is more in upper dermis
  - Clearer demarcation
- Primarily due to *S. pyogenes*
- Treatment for 7 – 10 days
  - Penicillin VK 250 – 500mg every 6hrs
  - Clindamycin 300 – 600mg every 6 -8hrs

2-71,72

Diabetic Foot Infections

- Usually polymicrobial
  - Gram-positive (MSSA, MRSA, strep, CNS)
  - Gram-negative (*E. coli, Klebsiella* spp., *Proteus* spp., *P. aeruginosa*)
  - Anaerobes (*B. fragilis, Peptostreptococcus* spp.)
- Presentation
  - Usually more extensive than they appear
  - Foul smell may be indicative of anaerobic involvement

2-72,73

Diabetic Foot Infections

- Treatment for 7 to 10 days, up to 2 weeks
  - Wound care & antimicrobials
  - Tight glycemic control
  - Mild infections can be treated outpatient from start
- Antimicrobials
  - Amoxicillin/clavulanate 875mg BID
  - Clindamycin 300-600mg TID (no gram-neg coverage)
  - Fluoroquinolones
    - Levo 500-750mg QD, cipro 500 mg BID, moxifloxacin 400mg QD)
    - Metronidazole may be added for better anaerobic coverage

2-73

Sexually Transmitted Diseases

- TS is a 23-year-old woman who comes to the university clinic concerned because she had unprotected sex with a guy she did not know at a party 15 days ago. She has no signs or symptoms, but she is very worried that she has contracted an STD because she heard this guy is notorious for having multiple partners. TS is taking birth control daily and has an allergy to penicillins (rash) but is otherwise healthy. An examination is performed, which reveals a positive pregnancy test and a Gram stain with gram-negative diplococci.

2-73

Gonorrhea and Chlamydia

- *Neisseria gonorrhoeae* & *Chlamydia trachomatis*
  - Coinfection common and should both be treated
- Clinical Presentation
  - Symptoms from 2 to 21 days after infection
    - More prominent for gonorrhea
    - Urethral or vaginal discharge
  - Diagnosis
    - Gram-stain for *N. gonorrhoeae*
    - Nucleic acid amplification tests (NAATs)
      - Increases ability to determine Chlamydia

2-74

Gonorrhea and Chlamydia

- Treatment for both should be initiated
- Gonorrhea
  - Cephalosporins
    - Ceftriaxone 250mg IM x 1
    - Cefotaxime 500mg IM x 1
    - Cefixime 400mg orally x 1
  - Fluoroquinolones (high rate of resistance)
    - Cipro 500mg PO once or Levofloxacin 250mg once)
- Chlamydia
  - Azithromycin 1g orally x 1
  - Doxycycline 100mg orally 2 times/day X 7 days

2-74

Gonorrhea and Chlamydia

- Which one of the following is the best treatment recommendation for TS?

A. Cefotaxime 500mg IM once plus azithromycin 1g PO once

B. Levofloxacin 250mg PO once plus azithromycin 1g orally once

C. Ceftriaxone 125mg IM once

D. Ceftriaxone 125mg IM once plus doxycycline 100mg PO 2 times/day for 7 days

2-73

Syphilis

- Caused by spirochete *Treponema palladium*
- Clinical Presentation
  - Primary Syphilis
    - 10 – 90 days
    - Single, painless chancre & regional lymphadenopathy
  - Secondary Syphilis
    - 2 to 8 weeks after initial infection
    - Multisystem involvement with pruritic or nonpruritic rash, mucocutaneous lesions, flulike symptoms
  - Tertiary
    - 10 to 30 years after initial infection
    - Neurosyphilis, cardiovascular syphilis

2-74 thru 76

Syphilis

- Treatment
  - Penicillin treatment of choice
    - Primary, secondary or latent syphilis
      - Benzathine PCN G 2.4 million units IM X 1
      - PCN allergic
        - Doxycycline 100mg PO BID for 14 days
        - Ceftriaxone 1gm IM or IV daily 8 – 10 days
    - Tertiary
      - Benzathine PCN G 2.4 million units once/week for 3 weeks
      - PCN allergic
        - Doxycycline 100mg PO BID for 28 days
- Follow-up VDRL test at 6 and 12 months

2-75,76

Genital Herpes

- Most common cause of genital ulceration
- Caused by herpes-simplex viruses (HSV-1 and HSV-2)
- Diagnosis usually physical findings
  - Prodromal mild burning, itching and tingling
  - Genital lesions
- Shedding lasts about 4 days

2-76,77

Genital Herpes

- Warm saline baths
- Analgesics & antipruritics
- First Episodes
  - Acyclovir 400mg TID for 7-10 days
  - Valacyclovir 1g BID for 7-10 days
- Recurrent Infections (start within 24hrs lesions/prodrome)
  - Acyclovir or Valacyclovir for 2 to 5 days
- Suppressive Therapy
  - Greater than 6 outbreaks per year
  - Daily therapy
    - Help prevent transmission to partners

2-76,77

General Antimicrobial Approach

- Best therapy for patient
  - Effective
  - Compliance
  - Affordable
- Be cognizant of collateral damage
  - Antimicrobial Resistance
    - Treatment of resistant organisms
    - Prevention
  - *C. difficile*
    - Risk with prolonged or broad-spectrum antimicrobials

2-77,78

American College of Clinical Pharmacy

Updates in Therapeutics® 2012:
Ambulatory Care Pharmacy Preparatory Review and Recertification Course

Human Immunodeficiency Virus and AIDS

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University of Kentucky College of Pharmacy

Conflict of Interest Disclosures

No conflicts of interest to disclose.

Learning Objectives/Agenda

1. **Review basic HIV-related pharmacotherapeutic concepts.**
2. **Discuss basic approaches to primary care and the management of HIV-associated sequelae.**
3. **Formulate treatment strategies for the management of HIV and associated opportunistic infections.**

PATIENT CASE #1

A.A. is a 29-year-old white man who has had two positive HIV ELISA tests and subsequently a positive Western blot. Today, his viral load is 58,525 copies/mL, and his CD_4^+ cell count is 310 cells/mm^3. A white blood cell count is 9800 cells/mm^3. The patient complains of fatigue and oral thrush. Which one of the following diagnoses is correct for this patient?

A. HIV

B. AIDS

C. Genetic immune deficiency syndrome

D. Kaposi sarcoma

E. Immune reconstitution syndrome

Workbook Page: 2-90; Answer Page: 2-109

CASE 1

Debrief

- CORRECT ANSWER: A [HIV]
- HIV:
  Routine Testing (13 – 64 YOA yearly)
  2 reactive HIV ELISAs (++ sensitivity)
  Confirmatory Western Blot
- AIDS:
  CD_4^+ cell count that is or ever has been < 200 cells/mm^3 or an ADI

Workbook Page: 2-90; Answer Page: 2-109

PATIENT CASE #2

B.T. is a 19-year-old white man who presents to your clinic for baseline assessment. B.T. reveals that he regularly has sex with both men and women. You counsel him regarding safer sex practices. He asks, "What is my risk of contracting HIV from oral sex?" Which one of the following statements is correct?

A. The risk of oral sex is minimal, especially for the insertive partner.

B. Oral sex carries the same level of risk as other sexual practices.

C. Oral sex is associated with a high risk of acquiring HIV but a low risk with respect to other sexually transmitted infections.

D. The risk of oral sex is comparable to the risk of vaginal intercourse.

Workbook Page: 2-91; Answer Page: 2-109

CASE 2

Debrief

- CORRECT ANSWER: A [Minimal Risk]
- Most US cases of HIV transmitted sexually
- Anal receptive>anal insertive>vaginal receptive>vaginal insertive>>>oral receptive>>>>oral insertive
- Latex or polyurethane condoms with lubricants (water-based)
- Transmission accelerates with STI co-infection

Workbook Page: 2-91; Answer Page: 2-109

PATIENT CASE #3

C.C. is a 28YO WF who acquired HIV from sharing needles with other injection drug users. Her viral load is 10,000 copies/mL, and her CD_4^+ cell count is 400 cells/mm^3. C.C. is currently in the 12th week of her first pregnancy. She is not taking antiretrovirals and refuses a complete HIV regimen because "she does not want to harm her baby." Which one of the following is the best advice for C.C.?

- A. Consider cesarian section instead of vaginal delivery to reduce HIV transmission risk.
- B. Consider initiating oral zidovudine monotherapy.
- C. Most antiretrovirals have been associated with fetal harm, and the risk of HIV transmission perinatally is very low; therefore, continue with current course.
- D. Spontaneous abortion is common in women with HIV infection who are not taking antiretrovirals; consider starting therapy immediately.

Workbook Page: 2-91; Answer Page: 2-109

CASE 3

Debrief

- CORRECT ANSWER: B [AZT monotherapy]
- Risk of transmission from pregnancy: ~ 26%
- AZT monotherapy (load plus oral dosing) reduction to 8%
- Preferred option 3 ARVs
- In pregnancy avoid:

  didanosine, stavudine, tenofovir, efavirenz**

Workbook Page: 2-91; Answer Page: 2-109

PATIENT CASE #4

T.P. is a 45-year-old man who is HIV seronegative and has sex regularly with other men. He wishes to reduce his risk of acquiring HIV and other sexually transmitted infections. Which one of the following suggestions is the best counseling advice?

- A. Use oil-based lubricants accompanied by dental dams.
- B. No additional measures are necessary as long as serosorting is used with partners.
- C. Employ water-based lubricants for oral sex and oil-based lubricants for all other exposures.
- D. Latex or polyurethane condoms should be used in all cases of exposure to sexual fluids.

Workbook Page: 2-92; Answer Page: 2-109

CASE 4

Debrief

- CORRECT ANSWER: D [latex/polyurethane]
- Latex condom best option with poly condoms for allergic patients
- Lubricants reduce trauma (oil based will compromise integrity of condom)

Workbook Page: 2-92; Answer Page: 2-109

PATIENT CASE #5

Your municipality is considering the implementation of a needle exchange program. You are consulted on the merits of such a program. Which one of the following statements is true?

- A. An exchange program may reduce the community-wide incidence of HIV and hepatitis A.
- B. Exchange programs may reduce the transmission of HIV, hepatitis B, and hepatitis C.
- C. These programs may reduce the local incidence of syphilis and gonorrhea.
- D. No significant reductions in the transmission of any diseases has been shown by such programs.

Workbook Page: 2-92; Answer Page: 2-109

CASE 5

Debrief

- CORRECT ANSWER: B [ex prog/HIV, Hep B/C]
- Ex Progs: credited with ⇩of injection drugs use to #3 most common transmission route in US
- Backloading
- Needle bleaching as alternative option

Workbook Page: 2-92; Answer Page: 2-109

PATIENT CASE #6

R.J. is a 23 YO WM who regularly has sex with other men and recently moved to a large urban area for a new job. During the past 2–3 days, he has dev extreme malaise that has made it difficult for him to complete day-to-day tasks. He has missed 1 day of work. The malaise has been accompanied by intermittent fevers and a nonspecific rash. He presents to a local urgent care center, where an OraQuick assay is reactive. Which one of the following statements is most likely true?

- A. The symptoms described are most likely signs of an opportunistic infection.
- B. No confirmation of the OraQuick will be necessary because R.J. is symptomatic.
- C. R.J. is likely HIV seropositive with a high viral load.
- D. Confirmatory HIV testing should be performed with an HIV ELISA.

Workbook Page: 2-94; Answer Page: 2-109

CASE 6

Debrief

- CORRECT ANSWER: C [conversion syndrome]
- Usually within weeks of initial infection
- Malaise, fatigue, rash
- High viremia
- May or may not detect the virus by ELISA and always confirm with Western Blot
- Usually resolves in days with establishment of an asymptomatic viral set-point

Workbook Page: 2-94; Answer Page: 2-109

PATIENT CASE #7

M.C. is a 52-year-old white woman who lives in a large urban area in the US where the HIV seroprevalence is estimated to be 1.3%. She is being seen by her primary care provider today. Which one of the following screening recommendations should be made for M.C. at this time?

- A. Be screened at this time.
- B. Be screened only if she has had an episode of unprotected sex since the last visit.
- C. Be screened only as a component of perinatal care.
- D. Be screened at this visit unless she has been previously screened in the past 2 years.

Workbook Page: 2-94; Answer Page: 2-109

CASE 7

Debrief

- CORRECT ANSWER: A [yearly screening]
- CDC: 2007 guidelines move from 'high risk' testing to 'routine testing'
- De-stigmatize testing and capture asymptomatics
- 13 to 64 years of age
- Local seroprevalence > 1%

Workbook Page: 2-94; Answer Page: 2-109

PATIENT CASE #8

A.Z. is a 31yo HIV+ F. She received this diagnosis 3 years ago and, since then, has never had a viral load that exceeded 1000 copies/mL. Her CD_4^+ cell count has ranged during the past 3 years from 500 to 600 cells/mm^3. Today, A.Z. has "tiredness and malaise." Lab results reveal a viral load of 56,000 copies/mL and a CD_4^+ cell count of 300 cells/mm^3. A.Z. is to be counseled regarding the initiation of an ARV therapy regimen. Which of the following are key points that should be included in this session?

- A. Therapy may be discontinued if the viral load remains undetectable for at least 1 year.
- B. Resistance testing will likely be performed to assist in drug selection.
- C. Therapy will likely consist of one or two antiretroviral agents.
- D. The goal of treatment will be to reduce the viral load to less than 1000 copies/mL.

Workbook Page: 2-95; Answer Page: 2-109

CASE 8

Debrief

- CORRECT ANSWER: B [3 drugs/resistance testing]
- TX: CD_4^+ cell count 350-500 cells/mm^3
- 3 ARV drugs selected by genotyping
- Tx is indefinate with goal of VL <48 copies/ml
- Drugs do not ever completely eradicate infection

Workbook Page: 2-95; Answer Page: 2-109

PATIENT CASE #9

F.F. is a 48YO WM with a long hx of HIV. F.F. has been treated since age 32 with several antiretroviral regimens. Most recently, he has used a 3-drug regimen consisting of two NRTIs and one integrase inhibitor. Today, his viral load is 10,000 copies/mL, representing an increase over the previous assay conducted 6 months ago at 8500 copies/mL. Which one of the following statements is true of resistance testing in this pt?

A. On the basis of this patient's history, resistance testing will not provide any usable information.

B. This patient is more likely to benefit from a genotypic assay.

C. This patient is more likely to benefit from a phenotypic assay.

D. The patient's viral load is too low to perform resistance testing.

Workbook Page: 2-96; Answer Page: 2-109

CASE 9

Debrief

- CORRECT ANSWER: C [phenotype]

Technique	Advantage	Limitation
Genotyping ***EARLY***	Availability Days to results Less technical	Indirect measure Expert interpretation required Minor species not tested
Phenotyping ***LATE***	Direct measure of susceptibility More familiar reporting results (IC_{50}, IC_{90})	Costly Weeks to results More technical Minor species not detected Breakpoints undefined

Workbook Page: 2-96; Answer Page: 2-109

PATIENT CASE #10

P.R. was given a dx of HIV by his PCP and referred to your clinic for the potential initiation of ARVs. P.R. is 23YO and has a hx of MA. He reports not having used any recreational drugs except for marijuana in the past 6 months. Lab values today include a viral load of 99,856 copies/mL and a CD_4^+ cell count of 309 cells/mm^3. Regarding the initiation of ARVs in this pt, which one of the following statements is most consistent with treatment consensus guidelines?

A. ARVS are indicated, and because the pt has a hx of drug abuse, the best initial regimen will include no more than two agents.

B. A triple ARV regimen should be initiated on the basis of this pts viral load.

C. Drug therapy is indicated because this pts CD_4^+ cell count is below a consensus treatment threshold.

D. On the basis of the pts lab values and hx of drug abuse, ARVs are not indicated.

Workbook Page: 2-97; Answer Page: 2-109

CASE 10

Debrief

- CORRECT ANSWER: C [CD_4^+ <350]
- Therapy @ CD_4^+ counts: 350-500 cells/mm^3
- Several patient-centered factors
- Consider adherence level/patient readniess
- History of substance abuse? (MA)
- Living situation?
- Co-morbidities?

Workbook Page: 2-97; Answer Page: 2-109

PATIENT CASE #11

A.Z. is a 31YO M with a hx of syphilis who was recently given a diagnosis of HIV infection. The pt has been prescribed Atripla. Which of the following statements are appropriate counseling points?

A. Therapy for HIV is lifelong. Atripla may cause vivid dreams and should be dosed at bedtime.

B. You should expect to be prescribed several other antiretroviral agents in combination with Atripla.

C. Atripla may increase serum bilirubin levels and should not be dosed with over-the-counter or prescription proton pump inhibitors.

D. Components of Atripla are sometimes used to manage acute hepatitis C. Atripla should be dosed in the morning to avoid nightmares in the evening.

Workbook Page: 2-100; Answer Page: 2-110

CASE 11

Debrief

- CORRECT ANSWER: A [Atripla® QHS]
- Atripla® represents only single pill, once daily three drug dosage form
- Components: TF, FTC, EFV
- Dosed at QHS to avoid 'CNS disengagement'
- Can cause vivid dreams/nightmares

Workbook Page: 2-100; Answer Page: 2-110

PATIENT CASE #12

T.T. is an established patient with HIV being switched from a regimen consisting of Truvada plus boosted darunavir to Epzicom® plus boosted darunavir. The switch is being made because the patient has developed some mild renal insufficiency. Which one of the following laboratory parameters should be assessed?

A. Renal ultrasound.

B. *HLA-B*5701.*

C. Hepatitis B surface antibody.

D. Bone density scan.

Workbook Page: 2-101; Answer Page: 2-110

CASE 12

Debrief

- CORRECT ANSWER: B [*HLA-B*5701*]
- Epzicom® (3TC/ABC)
- ABC can cause serious allergic reactions
- Predicted by *HLA-B*5701* screening

Workbook Page: 2-101; Answer Page: 2-110

PATIENT CASE #13

B.W. is a 42 YO WF with HIV currently being managed on the following ARV regimen: zidovudine, lamivudine, and atazanavir boosted with ritonavir. Which one of the following statements is correct regarding ritonavir boosting?

A. Ritonavir is an effective booster because of its potent effects as a CYP inducer.

B. When used as a booster, ritonavir should not be counted as a component of triple-drug antiretroviral regimens.

C. Ritonavir boosting is most often employed to augment serum levels of reverse transcriptase inhibitors.

D. When employed as a booster, ritonavir doses are usually 200 mg 2 times/day.

Workbook Page: 2-101; Answer Page: 2-110

CASE 13

Debrief

- CORRECT ANSWER: B [CP-450 inhibition]
- 'Ritonavir boosting': concept of producing a favorable PI-based drug interaction
- Allows substrate PI to be dosed down
- When boosting, ritonavir is not counted as a component of a 3 drug ARV regimen
- Ritonavir: GI toxicity

Workbook Page: 2-101; Answer Page: 2-110

PATIENT CASE #14

A patient is to be initiated on the following antiretroviral regimen: Truvada® plus ritonavir-boosted atazanavir. Monitoring should be conducted for which one of the following adverse effects?

A. Nephrolithiasis, hyperlipidemia.

B. Jaundice, nausea/vomiting, hyperlipidemia.

C. Elevated bilirubin, nausea/vomiting.

D. Hypersensitivity reaction, pruritus, nausea/vomiting.

Workbook Page: 2-101; Answer Page: 2-110

CASE 14

Debrief

- CORRECT ANSWER: C [Atanazavir ⇧ bili]
- Atazanavir may inc bili to 5x normal, jaundice
- Atazanavir associated with ⇩ in serum lipids
- Hypersensitivity: ABC
- Nephroplithiasis: indinavir
- N/V: ritonavir
- Hyperlipidemia: NRTIs and PIs

Workbook Page: 2-101; Answer Page: 2-110

PATIENT CASE #15

P.R. is a 45YO WM with a history of AIDS. His initial dx came more than 15 years earlier with an admission for PCP. The pt is currently taking the following medications: Combivir®, darunavir boosted with ritonavir, Bactrim DS®, omeprazole, and zolpidem. On the current ARV regimen, P.R. has remained stable with an undetectable VL for more than 2 years and CD_4^+ cell counts in the range of 180–200 cells/mm^3. Recent labs reveal a VL of 985 copies/mL and a CD_4^+ cell count of 195 cells/mm^3. He reports that he is fully adherent, "never missing a dose of his medications." One week before the last lab draw, P.R. reports that he had a prolonged episode of otitis media requiring 21 days of oral abx. Which one of the following is the most appropriate intervention?

A. Assess TMs and reinitiate oral abx for another 14-day course.

B. Order a genotypic resistance assay.

C. Discontinue the current antiretroviral regimen and initiate three new drugs.

D. Repeat the viral load and CD_4^+ cell count at today's visit.

Workbook Page: 2-102; Answer Page: 2-110

CASE 15

Debrief

- CORRECT ANSWER: D [recent infection blip]
- Acute infection ⇨ immune stimulation ⇨ VL blip
- Repeat counts to confirm before making significant interventions
- Ensure: adherence? recent vaccinations?

Workbook Page: 2-102; Answer Page: 2-110

PATIENT CASE #16

You evaluate a new HIV-seropositive pt (risk factor: MSM) who does not meet guidelines for the initiation of either ARVs or OI prophylaxis. His laboratory values are unremarkable. He is hep A antibody negative, hep B surface antigen negative and surface antibody positive, and hep C antibody negative. The pt cannot recall his last tetanus booster and is up-to-date on all childhood immunizations. The patient is allergic to PCN (rash). Which of the following vaccinations are indicated?

A. Internasal influenza, hepatitis B.

B. Influenza (intramuscular).

C. Hepatitis A, influenza (intramuscular), TdaP, pneumococcal.

D. Hepatitis A and B plus influenza (intramuscular), TdaP, pneumococcal.

Workbook Page: 2-102; Answer Page: 2-110

CASE 16

Debrief

- CORRECT ANSWER: C [killed vaccines]
- No live vaccines (varicella, zoster, MMR?, FluMist®)
- Killed vaccines:

Influenza IM (q year)
Pneumococcal (q 5-6 years)
Hep A (0 and 6)
Hep B (0, 1, and 6)
TdaP (x1 then Td q 10 years)
PPD (q year)

Workbook Page: 2-102; Answer Page: 2-110

PATIENT CASE #17

A nurse places a PPD on a 26-year-old white man with AIDS. This test will serve as his yearly TB screen. Which one of the following statements summarizes a correctly administered and read screening procedure?

A. Read the induration in 2 hours, and if positive, refer for pulmonary computed tomography (CT) scan.

B. Boost the original PPD in 24 hours and then read the infiltrate.

C. Read the induration in 48 hours, and if greater than 5 mm, refer for chest radiograph.

D. After PPD placement, administer an anergy panel and read in 72 hours; if greater than 15 mm, refer for pulmonary MRI (magnetic resonance imaging).

Workbook Page: 2-103; Answer Page: 2-110

CASE 17

Debrief

- CORRECT ANSWER: C [PPD q year]
- Read 48-72h post=placement
- Positive > 5mm induration
- Positive PPD in a known exposure: INH/B6 x 6 months
- Follow-up screening: CXR

Workbook Page: 2-103; Answer Page: 2-110

PATIENT CASE #18

Which one of the following HIV-positive patients meets the criteria for a diagnosis of AIDS?

A. A 45-year-old man with a codiagnosis of colon cancer.

B. A 26-year-old injection drug user with hepatitis C.

C. A 32-year-old woman with a CD_4^+ cell count of 210 cells/mm^3 and a viral load of 100,000 copies/mL.

D. A 19-year-old man after the detection of skin lesions consistent with Kaposi sarcoma.

Workbook Page: 2-103; Answer Page: 2-110

CASE 18

Debrief

- CORRECT ANSWER: D [ADIs = KS]
- AIDS:
  CD_4^+ cell count that is or ever has been < 200 cells/mm^3 or an ADI
- ADIs are a subset of serious OIs
- KS is an example of an ADI
- ADIs: PCP*, toxo*, MAC*, KS, TB, CMV

Workbook Page: 2-103; Answer Page: 2-110

PATIENT CASE #19

R.J. is a 22YO WM who acquired HIV from a blood transfusion as a child. His CD_4^+ cell count is 210 cells/mm^3 with a viral load of 56,456 copies/mL. R.J. is to commence antiretroviral therapy at today's clinic visit. His only complaint is oral thrush, which he noticed while brushing his teeth this morning. Which one of the following interventions is appropriate at this time?

A. Initiate 7–10 days of atovaquone plus Bactrim DS® 1 tablet by mouth every day.

B. Prescribe azithromycin 1200 mg by mouth once weekly.

C. Suggest peroxide, rinse twice daily, and prescribe Bactrim DS® 1 tablet by mouth 3 times/week.

D. Commence fluconazole therapy by mouth for 7–10 days.

Workbook Page: 2-104; Answer Page: 2-111

CASE 19

Debrief

- CORRECT ANSWER: D [Thrush ≠ ADI]
- Thrush – common oral sx treated episodically
- Frequent recurrences may require suppression
- Esophageal candidiasis – serious; tx with IV antifungals (fluconazole)
- No primary prophylaxis indicated when CD_4^+ count > 200 cells/mm^3

Workbook Page: 2-104; Answer Page: 2-111

PATIENT CASE #20

C.C. is a 45YO HIV-seropositive F who entered care after an episode of acute PCP that required intubation and intravenous therapy. During her PCP illness, a history of a sulfa allergy was discovered. C.C. is currently receiving ARV therapy for her HIV plus dapsone, omeprazole, zolpidem as needed, fluconazole, and ondansetron as needed. Currently, the patient's VL is 1000 copies/mL (down from 234,000 copies/mL 3 months earlier), and her CD_4^+ cell count is 90 cells/mm^3. In reviewing her medication therapy, which one of the following interventions is most appropriate?

A. The pt does not require any alterations or additions to pharmacotherapy.

B. Azithromycin 1200 mg by mouth once weekly should be added.

C. If continued therapy is anticipated, dapsone should be administered IV.

D. The current regimen provides insufficient prophylaxis against toxoplasmosis.

Workbook Page: 2-105; Answer Page: 2-111

CASE 20

Debrief

- CORRECT ANSWER: D [toxo prophylaxis]
- CD_4^+ count >100 cells/mm^3 but > 50 cells/mm^3 prophylaxis for PCP and toxo
- Bactrim DS® sufficient but dapsone insufficient for toxo
- Dapsone less likely to induce sulfa rash
- PCP 3rd line: atovaquone (liquid, $$$)

Workbook Page: 2-105; Answer Page: 2-111

PATIENT CASE #21

A.A. is a 52YO AA M given a diagnosis of AIDS in 1994. At that time, the pts VL was 150,000 copies/mL, and his CD_4^+ cell count was 12 cells/mm^3. Throughout A.A.'s illness, he has received diagnoses of and been treated for PCP, zoster, and several episodes of CAP. For the past 2 years, his viral load has been less than 48 copies/mL, and his CD_4^+ cell count has been no lower than 300 cells/mm^3. Which one of the following statements regarding A.A. is consistent with current guidelines?

A. He is not likely taking any opportunistic infection prophylaxis at this time.

B. He is likely on therapy with both azithromycin and Bactrim DS.

C. He is a candidate for immunization with varicella.

D. He may be initiated on antibiotic prophylaxis for the prevention of recurrent community-acquired pneumonia.

Workbook Page: 2-105; Answer Page: 2-111

CASE 21

Debrief

- CORRECT ANSWER: A [D/C of prophylaxis]
- Prophylaxis can be D/C when CD_4^+ cell count remains above a given threshold for at least 3-6 months with an undetectable VL
- Varicella is a live vaccine
- Prophylaxis for CAP is never indicated

Workbook Page: 2-105; Answer Page: 2-111

PATIENT CASE #22

You receive a frantic call from an RN during your morning shift. She reports that last evening, she sustained a needle stick while performing a venipuncture in the ED. The pts HIV status was unknown, but the pt did have a hx of IDU and Hep C. At home during the evening, the RN began searching the Internet for information on HIV transmission from needle sticks, and she became more concerned. Which one of the following recommendations is the best course of action?

A. Immediate consideration should be given to initiating a 3-drug ARV regimen.

B. The stick is beyond the period in which it may be efficacious to begin PEP; refer the nurse for HIV rapid testing.

C. Immediately begin 2-drug ARV therapy for the prevention of HIV and Hep C.

D. Commence Hep A and B immunization.

Workbook Page: 2-106; Answer Page: 2-111

CASE 22

Debrief

- CORRECT ANSWER: A [3-drug PEP]
- High risk pt with Hep C
- Mucous membrane or low risk exposure: 2-drug PEP
- Low risk: no treatment
- When did stick occur? (48-72h)
- What were you doing with instrument?
- What do you know about source pt?

Workbook Page: 2-106; Answer Page: 2-111

PATIENT CASE #23

H.H. is a 33-year-old man with newly diagnosed HIV. Today is his first visit to the HIV/AIDS clinic after initial screening at the local health department. In addition to confirmatory testing, which one of the following laboratory tests should be obtained at this time?

A. CD_4^+ cell count, viral load, AFB (acid-fast bacilli) cultures, and chest radiograph.

B. Computed tomography (CT) scan of the head, viral load, and rapid plasma regain (RPR).

C. Gonorrhea, chlamydia, and RPR screening.

D. Viral load, CD_4^+ cell count, p24 antigen levels, and herpes simplex virus antibodies.

Workbook Page: 2-106; Answer Page: 2-111

CASE 23

Debrief

- CORRECT ANSWER: C [STI screening]
- Gonorrhea, chlamydia, syphilis, Hep serologies
- CMP, CBC, LFTs, fasting lipids, VL, CD_4^+

Workbook Page: 2-106; Answer Page: 2-111

Miscellany/Pearls

- Certification [AAHIVM]: AAHIVE
- Atripla® vs. Complera®
- N/V/D
- Depression: SSRIs
- Lipids: ATA, atrovastatin, rousvastatin, pravastatin, fibrates, niacin, fish oil
- TB: rifabutin over rifampin
- Anxiety: avoid triazolam, alprazolam
- Ritonavir: potent CP450 inhibitor (X) interactions
- Erectile dysfunction?
- Ryan White Care Act
- ADAPs

Page 2-93

Figure 1. This figure is missing some text. The figure should appear as below: