
**STANDARD
NURSE PROTOCOLS
FOR
HIV/AIDS**

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2013-2014 HIV CINICAL REVIEW TEAM

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RECOMMENDATIONS FOR USE OF THE HIV/AIDS-RELATED STANDARD NURSE PROTOCOLS

The HIV Nurse Protocol Committee recommends the following HIV-related nurse protocols for use by public health nurses. **Use of standard nurse protocols from other areas is strongly encouraged in order to provide comprehensive care. The use of these protocols, such as the STD Nurse Protocols, Women’s Health Nurse Protocols and/or other HIV-related protocols by public health nurses should be based on the nurse’s experience, training, and competency. In the following HIV/AIDS-Related Standard Nurse Protocols, the term “provider” refers to an APRN or physician.**

Due to the rapidly evolving management of HIV disease, the HIV Nurse Protocol Committee recommends that individual protocols be locally updated as Department of Health and Human Services (DHHS) HIV-related guidelines are revised. Compliance with DHHS HIV/AIDS-related guidelines, including Opportunistic Infection (OI) guidelines, is a requirement of the Health Resources and Service Administration (HRSA) for sites receiving Ryan White Comprehensive AIDS Resources Emergency (CARE) Act funding. These guidelines are considered “living” documents and are available online at the AIDSinfo website <http://aidsinfo.nih.gov/>; therefore, changes in these guidelines supersede information in the following HIV/AIDS-related nurse protocols. Nurses should ensure that HIV-infected **patients** receive the recommended adult immunizations. For the latest recommendations see <http://www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm>.

The HIV Nurse Protocol Committee supports the use of the AIDS Education and Training Centers (AETC) manual, “The Clinical Manual for Management of the HIV-Infected Adult,” (current edition), as a reference guide for midlevel provider practice available online at <http://www.aidsetc.org/>. The Committee further recommends use of the current manual in conjunction with more frequently updated references, such as the current edition of *Medical Management of HIV Infection* by John G. Bartlett and Joel E. Gallant, and the DHHS HIV-related guidelines. Advance Practice Registered Nurses (APRNs) should list these documents in the “Reference Guidelines for Practice” section of the APRN protocol agreement and add HIV/AIDS-related medications to the APRN formulary. If the APRN is working under the Nurse Protocol Statute (O.C.G.A. §43-34-23), please note that the APRN agreement must exclude controlled substances. If the APRN is working under prescriptive authority (O.C.G.A. §43-34-25), the APRN agreement may include controlled substances.

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STANDARD NURSE PROTOCOL FOR CONTINUATION OF ANTIRETROVIRAL THERAPY IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION

Antiretroviral therapy refers to a combination of medications used to treat HIV infection. These drug combinations are commonly called **antiretroviral therapy (ART)**. Currently, there are six classes of these drugs approved by the Food and Drug Administration (FDA): nucleoside and nucleotide reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, protease inhibitors, fusion inhibitors, Chemokine receptor 5 antagonists, and integrase strand transfer inhibitors. Since the mid-1990s, when studies demonstrated the superiority of three-drug regimens over single or dual drug regimens, national guidelines have mandated the use of three or more drugs in combination to treat HIV infection.

Once an **ART** regimen is initiated, it is generally continued indefinitely unless the **patient** experiences medication intolerance, severe side effects, adverse reactions, or treatment failure.

SUBJECTIVE

1. Currently taking an appropriate **ART** regimen.
2. Reports medication adherence and a desire to continue current **ART** regimen.
3. Absence of adverse reactions or significant side effects to antiretroviral medications.
4. Absence of allergies to antiretroviral medications.
5. Obtain a complete medication profile to determine whether or not there are any clinically significant drug-drug interactions.

NOTE: Medication profiles should include over-the-counter (OTC) medications, herbals, vitamins, and prescription medications.

OBJECTIVE

1. CD4 count and HIV viral load history.
2. Resistance testing history.
3. No evidence of virologic or immunologic failure as defined in the Department of Health and Human Services (DHHS) antiretroviral guidelines.
4. The most recent complete blood count (CBC) with differential and platelet count, chemistry profile including liver and renal functions, and lipid profile are within acceptable values.

5. No evidence of past or current resistance to the **ART** regimen.

NOTE: Interpretation of resistance testing is often complex and requires consultation with specialists in HIV drug resistance. Consult the physician regarding results of resistance testing (e.g., drug resistance mutations detected with a genotype).

6. If ordering abacavir, no evidence of Human Leukocyte Antigen – B*5701 (HLA-B*5701) positive test result.
7. If ordering a CCR5 antagonist (e.g., maraviroc), no evidence of Chemokine receptor 4 (CXCR4) or dual/mixed coreceptor tropism.

NOTE: Maraviroc should **only** be considered a fully active antiretroviral agent in treatment-experienced **patients** who have only R5 virus and who are naïve to CCR5 inhibitors. **A tropism assay must be obtained before a CCR5 inhibitor is used.**

ASSESSMENT

No contraindications for continuation of antiretroviral regimen.

PLAN

DIAGNOSTIC STUDIES

1. Repeat CD4 count and HIV viral load, if indicated.
2. Repeat CBC with differentials, chemistry profile including liver and renal function, and lipid profile, if indicated.

THERAPEUTIC

1. Order one-month supply of each antiretroviral medication the **patient** is currently taking. See the latest DHHS antiretroviral guidelines, “Guidelines for the Use of Antiretroviral Agents in HIV-1 Infected Adults and Adolescents,” for recommendations including antiretroviral regimens, agent formulations and dosing, adverse events, and drug-drug interactions. The guidelines are available online at <http://www.aidsinfo.nih.gov/>.
2. Review the **patient’s** current medication list for possible drug-drug interactions. Include prescription medications, OTC drugs/products, and nutritional or herbal supplements.

NOTE: Antiretroviral medications frequently have drug-drug interactions that require dose modifications. Check with the physician, a pharmacist, drug and HIV references, and/or the latest DHHS antiretroviral guidelines for appropriate dose modifications. Other online references include:

- HIV Insite, *Database of Antiretroviral Drug Interactions*, <http://www.hivinsite.org/InSite?page=ar-00-02>
- AIDSmeds.com, *Check My Meds*, <http://www.aidsmeds.com/cmm/>
- University of Liverpool, *HIV Drug Interactions*, <http://www.hiv-druginteractions.org/>

PATIENT EDUCATION/COUNSELING

1. Review current drug regimen including drug storage, dose, route of administration, schedule, food requirements or restrictions, side effects, potential drug-drug interactions, and follow-up monitoring.
2. Provide measures to promote adherence such as written medication schedules and pillboxes.
3. Discourage **patient** from stopping **ART** regimen without consulting provider first.

NOTE: Simultaneously discontinuing all drugs in **an ART** regimen may lead to “functional” monotherapy of one drug due to the drug’s longer half-life compared with the other drugs (e.g., data have shown that efavirenz or nevirapine drug levels may persist for 21 days or longer). Currently there are no guidelines for optimal discontinuation intervals between drugs. Check with the physician concerning discontinuation instructions. **Patients** with hepatitis B coinfection receiving one or a combination of NRTIs (i.e., emtricitabine, lamivudine, or tenofovir) may experience an exacerbation of hepatitis upon drug discontinuation.

4. Instruct **patient** to return for scheduled appointment. Stress that failure to keep appointments may result in discontinuation of medications.
5. Ask **patient** to immediately report adverse drug reactions, side effects or other changes in health that he/she feels are important to his/her care provider.

NOTE: If **patient** experiences hypersensitivity reactions to abacavir, it should be discontinued immediately. **Patients who have a HLA-B*5701-positive screen should not be prescribed abacavir, and positive status should be recorded as an abacavir allergy. Patients including those with negative screening tests should be warned to consult their provider immediately if they note two or more of the hallmark symptoms, including fever, skin rash, GI symptoms (nausea, vomiting, diarrhea, abdominal pain), respiratory symptoms (cough, dyspnea, pharyngitis) and/or constitutional symptoms (malaise,**

fatigue, myalgia) especially during the first month of therapy. If the **patient** stops taking abacavir because of adverse reactions, it should not be re-started. Abacavir hypersensitivity reactions can be fatal.

6. Instruct **patient** that HIV medications, especially **protease inhibitors** and **non-nucleoside reverse transcriptase inhibitors**, have a high potential for significant drug interactions.
7. Ask **patient** to check with his/her pharmacist or provider about interactions before taking a new medication, nutritional or herbal supplement, or OTC drug/product.
8. Request that the **patient** not “borrow” medications from friends or family or obtain prescription drugs outside the care of his/her physician (e.g., erectile dysfunction agents).
9. Instruct **patient** to bring all medications, nutritional or herbal supplements, and OTC drugs/products to his/her medical appointments.

FOLLOW-UP

Return appointment with **provider** in 2-4 weeks.

CONSULTATION/REFERRAL

1. Refer the following to the physician:
 - a. Non-adherent **patients**.
 - b. **ART** regimens that do not follow the latest DHHS treatment guidelines.
 - c. Suspected treatment failure.
 - d. Adverse reactions to **ART** or severe/significant side effects.
 - e. Results of drug resistance testing.
2. Consult with the physician concerning any abnormal lab results.
3. Consult with the physician concerning instructions for discontinuing **ART** regimens.
4. Consult with the physician concerning antiretroviral therapy in **patients** with renal or hepatic insufficiency.
5. Consult with the physician if a **patient** on an abacavir-containing regimen is HLA-B*5701 positive.

6. Consult with the physician if a **patient** on a CCR5 antagonist has CXCR4 or dual/mixed coreceptor tropism.

REFERENCES

1. AIDS Education and Training Centers, "Drug-Drug Interactions with HIV-Related Medications," *Clinical Manual for Management of the HIV-Infected Adult*, 2006 ed., 2007, <http://www.aids-etc.org/aetc/aetc?page=cm-312_drug> (March 8, 2013).
2. "Check My Meds," *AIDSMeds.com*, <<http://www.aidsmeds.com/cmm/>> (March 8, 2013).
3. **John Bartlett and Joel Gallant, 2012 Medical Management of HIV Infection, Johns Hopkins University, 2012.**
4. Department of Health and Human Services, Guidelines on the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents, <http://www.aidsinfo.nih.gov/contentfiles/adultandadolescentgl.pdf> (March 8, 2013).
5. "HIV Insite," *Database of Antiretroviral Drug Interactions*, <<http://www.hivinsite.org/InSite?page=ar-00-02>> (March 8, 2013).

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STANDARD NURSE PROTOCOL FOR NEW ONSET (ACUTE) DIARRHEA IN HIV-INFECTED ADULT OR ADOLESCENT

- DEFINITION** Acute diarrhea is a change in normal bowel movements characterized by abrupt or gradual onset of frequent (more than 3-4 per day) liquid or soft stools for more than 3 days and less than 14 days. Large volume of stools with periumbilical pain usually indicates small bowel disease. Small volume, frequent stools, which may be associated with urgency, tenesmus, lower abdominal cramps or perianal pain, are usually associated with colonic and/or anorectal disease.
- ETIOLOGY** There are many possible causes of acute diarrhea ranging from medication side effects to infections.
- SUBJECTIVE**
1. Assess pattern of diarrhea: onset, duration, amount, frequency, and appearance (e.g., foul-smelling, frothy, black, watery, visible blood, pus, mucus).
 2. Assess whether or not diarrhea is interfering with activities of daily living.
 3. May or may not be accompanied by one or more of the following:
 - a. Fever.
 - b. Abdominal pain/cramping.
 - c. Nausea and/or vomiting.
 - d. Bloating.
 - e. Urgency.
 - f. Tenesmus (i.e., anal pain and spasms that may include the urge to defecate without being able to pass stool).
 - g. Perianal pain and/or sores.
 - h. Recent involuntary weight loss.
 - i. Difficulty urinating.
 4. May or may not have symptoms of dehydration (e.g., thirst, decrease in urine output, dark-colored urine, dry skin and mucous membranes, fatigue, light-headedness, and rapid heartbeat).
 5. May or may not report a history of the following:
 - a. Taking medications which cause diarrhea (e.g. protease inhibitors).
 - b. Antibiotics taken within the last 6-8 weeks.
 - c. Recent hospitalization.
 - d. Recent travel to a foreign and/or developing country or camping trip.
 - e. Exposure to potentially contaminated food or water (e.g., ingestion of raw meat, eggs, or shellfish, lake or stream water, or recalled food products).

- f. Recent herbal or alternative therapies.
- g. Exposure to a pet or another animal with diarrhea.
- h. Exposure to a coworker or family member with similar illness.
- i. Recent receptive anal sex and/or oral-anal sexual contact and/or sexually transmitted disease.
- j. Working in daycare, healthcare, or food industry.
- k. Food intolerance (e.g., lactose intolerance).
- l. Irritable bowel syndrome or inflammatory bowel disease.
- m. Anxiety disorders, panic attacks, or new emotional stress.
- n. Laxative abuse or eating disorder.
- o. Alcohol or other recreational drug use.

OBJECTIVE

- 1. May or may not have fever and/or recent weight loss.
- 2. May or may not have signs of dehydration (e.g., postural hypotension, orthostatic pulse, tachycardia, dry mucous membranes, poor skin turgor, and lethargy).
- 3. May or may not have hyperactive or hypoactive bowel sounds, abdominal tenderness or distention, organomegaly, perianal lesions or tissue breakdown, or heme-positive stools.
- 4. Current CD4 count.

ASSESSMENT

New onset (acute) diarrhea

PLAN

THERAPEUTIC

PHARMACOLOGIC

If **patient** is afebrile and without bloody stools and/or abdominal pain, and diarrhea is concomitant with starting of antiretroviral agents (e.g., nelfinavir), may order:

- 1. Calcium 500 mg tablets by mouth two times/day for 7 days,
AND/OR
- 2. Loperamide HCL 4 mg by mouth initially and then 2 mg after each stool to a maximum of 16 mg/day for 7 days.

NOTE: Antidiarrheal agents should not be used in cases of bloody diarrhea or if suspect *C. difficile*-related diarrhea. In **patients** taking atazanavir or tipranavir, avoid simultaneous administration of antacids (e.g., Tums); give atazanavir or tipranavir 2 hours before or 1 hour after these medications.

NON-PHARMACOLOGIC

1. Adjust diet and fluid intake to decrease diarrhea and maintain adequate hydration and electrolyte levels (see below in client education/counseling).
2. If history of lactose intolerance, avoid dairy products or take lactaid pills before ingesting dairy products.
3. Discontinue any newly started herbal or alternative therapy.
4. If diarrhea is associated with recent antibiotic therapy the normal bacterial flora of the intestinal tract may need to be replaced, increase intake of probiotics either through over-the-counter *Lactobacillus* products or through food products (e.g., buttermilk or yogurt).

NOTE: If allergic to milk or dairy products or sensitive to lactose, avoid using Lactobacillus products. Cases of severe infections with Lactobacillus have been reported in **patients** with late stage AIDS. The use of probiotics in clients with low CD4 counts should be done with caution.

PATIENT EDUCATION/COUNSELING

1. Instruct **patient** to maintain hydration and electrolyte levels by ingesting ½-strength Gatorade, broth, soups, ½-strength fruit juices.

NOTE: Formula for inexpensive oral rehydration solution - dissolve the following in 1L (approximately 33 ounces) of water: ¾ teaspoon table salt, 1 teaspoon baking soda, and 4 tablespoons sugar, then add 1 cup of orange juice or 2 bananas.

2. Instruct **patient** to avoid foods that tend to aggravate diarrhea, including milk/dairy products, and foods that are greasy, high-fiber or very sweet. Also, avoid products that contain alcohol or caffeine.
3. Encourage client to eat small meals every 2-3 hours. Gradually add soft, bland foods to diet, including bananas, plain rice, boiled potatoes, toast, crackers, cooked carrots, and skinless baked chicken.
4. Instruct **patient** to keep perianal area clean and dry. May use sitz baths and perineal hygiene cleaners and skin-protection ointments to maintain skin integrity.

5. Inform **patient** given calcium or loperamide HCL that he/she should experience improvement of symptoms within a few days. If symptoms do not improve within 2-3 days or if symptoms worsen, contact provider. If constipation occurs, reduce doses.
NOTE: Instruct **patients** taking atazanavir or tipranavir to avoid simultaneous administration of antacids (e.g., Tums); take atazanavir or tipranavir 2 hours before or 1 hour after antacids.
6. Stress the importance of not stopping antiretroviral therapy or other medications unless he/she has consulted with his/her provider first.
7. If suspect infectious diarrhea, instruct **patient** to not work as a food handler until diarrhea is controlled. Stress importance of hand washing.
8. Instruct **patient** on ways to prevent diarrhea in the future, including: drinking bottled or purified water, using proper food handling and cooking techniques, avoiding recalled food products, and performing proper hand-washing techniques.

FOLLOW-UP

Return appointment **as needed with provider** if symptoms have not improved/resolved.

CONSULTATION/REFERRAL

1. Refer **patients** immediately to the physician for any of the following (**patient** may require hospitalization):
 - a. Fever over 101 degrees Fahrenheit.
 - b. Blood in the stool.
 - c. Signs and symptoms of dehydration.
 - d. Profuse diarrhea.
 - e. CD4 counts less than 100 cells/mm³.
 - f. Abdominal pain and/or distention.
 - g. Perianal pain and/or lesions.
 - h. Recent involuntary weight loss of 3-5 lbs. or more.
 - i. Difficulty urinating.
 - j. Suspect infectious agent causing diarrhea.
 - k. Suspect laxative abuse.
2. Consult with physician to discontinue and/or change medications that may be causing diarrhea.
3. Refer to mental health provider if **patient** has new emotional stress, history of eating disorder/laxative abuse, anxiety disorder or panic attacks.

4. May refer to dietitian/nutritionist for further dietary recommendations.
5. Consult physician concerning **patients** who have persistent diarrhea for greater than 7 days in spite of taking antidiarrheal agents.

REFERENCES

1. **John Bartlett and Joel Gallant, 2012 *Medical Management of HIV Infection*, Johns Hopkins University, 2012, pp. 501-503 (March 8, 2013). (Current)**
2. Department of Health and Human Services, *Guidelines on the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents*, <<http://aidsinfo.nih.gov/contentfiles/AdultandAdolescentGL.pdf>> (March 8, 2013).
3. **Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents** http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi_041009.pdf (March 8, 2013).
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6. C. A. Horwitch, et al., "Lactobacillema in Three Patients with AIDS," *Clinical Infectious Diseases*, Vol. 21, No. 6, December 21, 1995, pp. 1460-1462. (March 8, 2013). (Current)
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STANDARD NURSE PROTOCOL FOR PERSISTENT (CHRONIC) DIARRHEA IN HIV-INFECTED ADULT OR ADOLESCENT

- DEFINITION** Chronic diarrhea is a change in normal bowel movements characterized by frequent (more than 3-4 per day) liquid or soft stools for more than 2 weeks. Large volume of stools with periumbilical pain usually indicates small bowel disease. Small volume, frequent stools, which may be associated with urgency, tenesmus, lower abdominal cramps or perianal pain, are usually associated with colonic and/or anorectal disease.
- ETIOLOGY** Chronic diarrhea in HIV-infected adults is often related to an enteric pathogen or medications. However, in some **patients** no cause is identified.
- SUBJECTIVE**
1. Assess pattern of diarrhea: onset, duration, amount, frequency, appearance (e.g., foul-smelling, frothy, black, watery, visible blood, pus, mucus).
 2. Assess whether or not diarrhea is interfering with activities of daily living.
 3. May or may not be accompanied by one or more of the following:
 - a. Fever.
 - b. Abdominal pain/cramping.
 - c. Nausea and/or vomiting.
 - d. Bloating.
 - e. Urgency.
 - f. Tenesmus (i.e., anal pain and spasms that may include the urge to defecate without being able to pass stool).
 - g. Perianal pain and/or sores.
 - h. Involuntary weight loss.
 - i. Difficulty urinating.
 4. May or may not have symptoms of dehydration (e.g., thirst, decrease in urine output, dark-colored urine, dry skin and mucous membranes, fatigue, light-headedness, and rapid heartbeat).
 5. May or may not report a history of the following:
 - a. Taking medications which cause diarrhea (e.g. protease inhibitors).
 - b. Antibiotics taken within the last 6-8 weeks.
 - c. Recent hospitalization.
 - d. Recent travel to a foreign and/or developing country or camping trip.
 - f. Exposure to potentially-contaminated food or water (e.g., ingestion of raw meat, eggs, or shellfish, lake or stream water, or recalled food products).

- g. Recent herbal or alternative therapies.
- h. Exposure to a pet or another animal with diarrhea.
- i. Exposure to a coworker or family member with similar illness.
- j. Recent receptive anal sex and/or oral-anal sexual contact and/or sexually transmitted disease.
- k. Working in daycare, healthcare, or food industry.
- l. Food intolerance (e.g., lactose intolerance).
- m. Irritable bowel syndrome or inflammatory bowel disease.
- n. Anxiety disorders, panic attacks, or new emotional stress.
- o. Laxative abuse or eating disorder.
- p. Alcohol or other recreational drug use.

OBJECTIVE

1. May or may not have fever and/or weight loss.
2. May or may not have signs of dehydration (e.g., postural hypotension, orthostatic pulse, tachycardia, dry mucous membranes, poor skin turgor, and lethargy).
3. May or may not have hyperactive or hypoactive bowel sounds, abdominal tenderness or distention, organomegaly, perianal lesions or tissue breakdown, heme-positive stools.
4. Current CD4 count.

ASSESSMENT

Persistent (chronic) diarrhea

PLAN

DIAGNOSTIC STUDIES

1. CBC and serum chemistry (i.e., electrolytes, BUN, and creatinine).
2. Stool for *C. difficile* toxin assay. Repeat up to two additional assays for *C. diff* toxin if the first is negative.

NOTE: Recent studies indicate that community-associated *Clostridium difficile* is increasing and may not be linked to recent antibiotic use. Some studies identified a possible link with proton pump inhibitor therapy.

3. Stool for:
 - a. Bacterial culture (if negative repeat x 1-2).
 - b. Mycobacterial culture if CD4 count less than 100/mm³.
 - c. AFB smear (if negative repeat x 1-2) if CD4 count less than 100/mm³.
 - d. Ova and Parasites (O&P) examination for intestinal parasites (repeat specimen collection for 3 consecutive days):
PLUS

- 1) Modified acid-fast stain for *Cryptosporidia*,
Cyclospora, *Isospora*.
 - 2) Chromotrope or other stains for Microsporidia.
 - e. *Giardia* antigen detection by direct Immunofluorescence or
by enzyme-linked immunoassay (EIA).
4. May order direct Immunofluorescence or enzyme-linked
immunoassay (EIA) for detection of *Cryptosporidia* antigens.

THERAPEUTIC

PHARMACOLOGIC

If **patient** is afebrile and without bloody stools and/or abdominal pain; and/or **patient** is taking antiretroviral agents, which may cause diarrhea (e.g., nelfinavir), may order:

1. Calcium 500 mg tablets by mouth two times/day,
AND/OR
2. Loperamide HCL 4 mg by mouth initially and then 2 mg by
mouth after each stool to a maximum of 16 mg/day,
AND/OR
3. Stool Bulking Agents
 - a. Psyllium powder, **1 teaspoon** (e.g., Metamucil®)
mixed in 2/3 of fluid required on package instructions
by mouth daily or two times/day,
OR
 - b. Psyllium fiber wafers, 2 wafers by mouth daily or two
times/day,
OR
 - c. Oat bran tablets 1500 mg by mouth two times/day.

NOTE: Antidiarrheal agents should not be used in cases of bloody diarrhea or if suspect *C. difficile*-related diarrhea. Psyllium should be taken at least 2-3 hours before or after other drugs because it can decrease effects of certain drugs. In **patients** taking

atazanavir or tipranavir, avoid simultaneous administration of antacids (e.g., Tums); give atazanavir or tipranavir 2 hours before or 1 hour after these medications.

NON-PHARMACOLOGIC

1. Adjust diet and fluid intake to decrease diarrhea and maintain adequate hydration and electrolyte levels (see below in **patient** education/counseling).

2. If history of lactose intolerance, avoid dairy products or take lactaid pills before ingesting dairy products.
3. Discontinue any newly started herbal or alternative therapy.
4. If diarrhea is associated with recent antibiotic therapy, the normal bacterial flora of the intestinal tract may need to be replaced, increase intake of probiotics either through over-the-counter *Lactobacillus* products or through food products (e.g., buttermilk or yogurt).

NOTE: If allergic to milk or dairy products or sensitive to lactose, avoid using Lactobacillus products. Cases of severe infections with Lactobacillus have been reported in **patients** with late stage AIDS. The use of probiotics in **patients** with low CD4 counts should be done with caution.

PATIENT EDUCATION/COUNSELING

1. Instruct **patient** to maintain hydration and electrolyte levels by ingesting ½-strength Gatorade, broth, soups, ½-strength fruit juices.

NOTE: Formula for inexpensive oral rehydration solution - dissolve the following in 1L (approx. 33 ounces) of water: ¾ teaspoon table salt, 1 teaspoon baking soda, and 4 tablespoons sugar, then add 1 cup of orange juice or 2 bananas.

2. Instruct **patient** to avoid foods that tend to aggravate diarrhea, including milk/dairy products, and foods that are greasy, high-fiber or very sweet. Also avoid products that contain alcohol or caffeine.
3. Encourage **patient** to eat small meals every two-three hours. Gradually add soft, bland foods to diet, including bananas, plain rice, boiled potatoes, toast, crackers, cooked carrots, and skinless baked chicken.
4. Instruct **patient** to keep perianal area clean and dry. **Patient** may use sitz baths, perineal hygiene cleaners, and skin-protection ointments to maintain skin integrity.
5. Inform **patient** given calcium or loperamide HCL that he/she should experience improvement of symptoms within a few days. If symptoms do not improve within 2-3 days or if symptoms worsen, contact provider. If constipation occurs, reduce doses.

NOTE: Instruct **patients** taking atazanavir or tipranavir to avoid simultaneous administration of antacids (e.g., Tums); take atazanavir or tipranavir 2 hours before or 1 hour after antacids.

6. Instruct **patient** to notify provider if symptoms worsen or do not improve.
7. Stress the importance of not stopping antiretroviral or other medications unless he/she has consulted with his/her provider first.
8. If suspect infectious diarrhea, instruct **patient** to not work as a food handler until diarrhea is controlled. Stress importance of hand washing.
9. Instruct **patient** on ways to prevent diarrhea in the future, including: drinking bottled or purified water, using proper food handling and cooking techniques, avoiding recalled food products, and performing proper hand-washing techniques.
10. Inform **patients** who have well water or private water sources to consider testing water source by obtaining test kit and instructions from local Environmental Health office.

FOLLOW-UP

Return appointment **with provider** as needed, if symptoms have not improved or do not resolve.

CONSULTATION/REFERRAL

1. Refer **patient** immediately to the physician for the following (**patient** may require hospitalization):
 - a. Fever over 101 degrees Fahrenheit.
 - b. Blood in the stool.
 - c. Signs and symptoms of dehydration.
 - d. CD4 counts less than 100 cells/mm³.
 - e. Abdominal pain and/or distention.
 - f. Perianal pain and/or lesions.
 - g. Involuntary weight loss of over 5 lbs.
 - h. Difficulty urinating.
 - i. Suspect infectious agent causing diarrhea.
 - j. Suspect laxative abuse.
2. Consult with physician to discontinue and/or change medications that may be causing diarrhea.
3. Notify **provider** of stool studies and lab results. If specific etiology revealed, refer to **provider** for treatment.

4. If stool studies are negative and symptoms continue, consult with physician for further testing (e.g., endoscopy, sigmoidoscopy, or colonoscopy).
5. Refer to mental health provider if **patient** has new emotional stress, history of eating disorder/laxative abuse, anxiety disorder or panic attacks.
6. May refer to dietitian/nutritionist for further dietary recommendations.
7. If antidiarrhea treatment was ordered and did not improve or resolve diarrhea, consult physician.

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STANDARD NURSE PROTOCOL FOR DISSEMINATED MYCOBACTERIUM AVIUM COMPLEX PROPHYLAXIS IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION/ INDICATION

HIV-infected persons with CD4 counts less than $50/\text{mm}^3$ should receive primary prophylaxis to prevent a first episode of disseminated *Mycobacterium avium* complex (DMAC) disease.

Persons with disseminated DMAC should receive lifelong therapy (i.e., secondary prophylaxis or maintenance therapy), unless immune reconstitution occurs due to **antiretroviral therapy (ART)**.

Primary prophylaxis should be discontinued in **patients** who have responded to **ART** and have sustained CD4 counts greater than $100/\text{mm}^3$ for 3 months or more (immune reconstitution). Primary prophylaxis should be reintroduced if the CD4 count decreases to less than $50\text{-}100/\text{mm}^3$.

Secondary prophylaxis should be discontinued in **patients** who have completed at least 12 months treatment for DMAC, are asymptomatic for DMAC, have responded to **ART**, and have sustained CD4 counts greater than $100/\text{mm}^3$ for 6 months or more. Secondary prophylaxis should be reintroduced if the CD4 count decreases to less than $100/\text{mm}^3$.

ETIOLOGY

DMAC is a bacterial infection composed of *Mycobacterium avium* and *Mycobacterium intracellulare* organisms. These organisms are found in the environment, such as food, water, soil and animals. MAC organisms may enter the body via the gastrointestinal or respiratory tracts. Data suggests that DMAC results from new infection instead of reactivation of latent infection.

SUBJECTIVE

1. May or may not have a history of DMAC and/or treatment for DMAC.
2. No history of active tuberculosis (TB).
3. No symptoms suggestive of DMAC (e.g., fevers, chills, night sweats, weight loss, abdominal pain or diarrhea).
4. Absence of allergies to macrolide antibiotics (e.g. **azithromycin**, clarithromycin, erythromycin) or ethambutol.
5. Obtain a medication profile to determine whether or not there are any clinically significant drug-drug interactions with treatment.

NOTE: Medication profiles should include over-the-counter medications, herbals, vitamins, and prescription medications.

OBJECTIVE

1. CD4 count less than $50/\text{mm}^3$, unless history of DMAC disease with treatment.
2. Absence of signs of current DMAC infection (e.g., weight loss, fever, enlarged spleen or liver, abdominal tenderness).
3. If blood culture for MAC performed, is negative for MAC.
4. Complete blood count (CBC) with differential and platelet count, liver and renal functions within acceptable values.
5. No signs of active TB.

ASSESSMENT

Candidate for DMAC prophylaxis (primary or secondary), at risk of DMAC disease

PLAN

THERAPEUTIC

PHARMACOLOGIC

1. Primary Prophylaxis (Prevention of First Episode of DMAC Disease)
If no history of DMAC, and CD4 count less than $50/\text{mm}^3$, order:
 - a. Azithromycin 1,200 mg by mouth once per week
OR
 - b. Clarithromycin 500 mg by mouth two times/day
2. Secondary Prophylaxis (Chronic Maintenance Therapy)
If history of DMAC disease with treatment, order:
 - a. First Choice:
Clarithromycin 500 mg by mouth two times/day
PLUS
Ethambutol 15 mg/kg by mouth daily
OR
 - b. Alternative:
Azithromycin 500–600 mg by mouth daily
PLUS
Ethambutol 15 mg/kg by mouth daily

NOTE: Aluminum- and magnesium-containing antacids decrease serum levels of azithromycin. Avoid concurrent administration of aluminum or magnesium containing antacids with azithromycin. Aluminum-containing antacids decrease absorption of ethambutol. Avoid concurrent administration of aluminum-containing antacids for at least 4 hours following ethambutol. Clarithromycin has many drug-drug interactions and doses may need to be adjusted. If break-through DMAC occurs, there is a chance it may be macrolide resistant. Rifabutin is an alternative prophylactic agent for DMAC disease but, because of associated drug interactions, physicians should make the decision about ordering this medication.

PATIENT EDUCATION/COUNSELING

1. Explain reason for regimen. Review current drug regimen, including: drug storage, dose, route of administration, schedule, side effects and follow-up monitoring.
2. Instruct **patient** to stop the medications and immediately report adverse drug reactions, side effects (e.g., rash, vomiting, severe diarrhea, fever, chills, numbness or tingling in arms or legs, persistent loss of appetite, vision changes) or other changes in health that he/she feels are important to his/her provider.
3. If **patient** is taking ethambutol, instruct to report vision changes immediately.
4. Instruct that taking medications as ordered and keeping appointments is very important to prevent this life-threatening illness.
5. Explain that prophylaxis may be discontinued due to sustained rise in CD4 count while on **ART**, but may need to be re-started in the event of stopping **ART**, CD4 counts dropping or if health condition worsens.
6. Instruct **patient** to report any signs and symptoms of DMAC to **his/her** provider.
7. Ask female **patient** to inform **her** provider if she is, or is planning to become, pregnant.

FOLLOW-UP

1. Monitor for medication adherence, adverse drug events and medication side effects.
2. Obtain and monitor CBC with differential and platelet count, and renal and liver function tests, within 4-6 weeks of initiation of regimen and then as indicated.
3. Monitor for signs/symptoms of DMAC.
4. Obtain and monitor CD4 counts and percentage at least every 3-6 months.
5. Monitor vision in **patients** taking ethambutol by providing vision checks monthly, which include visual acuity and red/green color discrimination.

CONSULTATION/REFERRAL

1. Notify the physician of the following:
 - a. Abnormal lab values.
 - b. Medication side effects and/or adverse events.
 - c. Signs/symptoms of DMAC.
 - d. Changes in visual acuity or red/green color discrimination.
2. Defer the decision to discontinue primary or secondary prophylaxis to physician.
3. Defer the decision to initiate rifabutin as an alternative prophylactic agent for DMAC disease to the physician.
4. Refer pregnant **patients** to the physician.

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STANDARD NURSE PROTOCOL FOR HERPES ZOSTER (SHINGLES) IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION

Herpes zoster is a viral illness that usually presents as a vesicular rash, with pain and itching, in a unilateral dermatomal distribution. The duration of vesicles and crusts, as well as significant pain, is usually 2-3 weeks. Thoracic dermatomes are most frequently involved, followed by cranial nerve, cervical, lumbar, and sacral dermatomes. Involvement of the trigeminal nerve can cause infection of the eye, which may lead to blindness. Rarely, the eyes are affected when other dermatomes are infected.

Herpes zoster is seen throughout the course of HIV infection and is particularly common in healthy-appearing individuals before the onset of other HIV-related symptoms, but frequency of disease is highest with CD4 counts less than 200 cells/mm³ and is not reduced by antiretroviral therapy. It may be particularly painful, necrotic and hemorrhagic in HIV-infected persons. Necrotic lesions may last for up to six weeks and cause severe scarring.

Disseminated varicella zoster virus (VZV) infection is uncommon, but when it occurs it usually involves the skin and/or visceral organs. Dissemination to the skin may appear identical to primary VZV infection (i.e., chickenpox). If dissemination occurs to the viscera, it may involve the lungs, liver or central nervous system (CNS) and may be fatal. The CNS is the primary target for herpes zoster dissemination in **patients** co-infected with HIV. Chronic lesions of VZV may be verrucous (i.e., resembling warts or psoriasis). Secondary bacterial infections of the skin may occur, which may be severe (e.g., necrotizing fasciitis) and require hospitalization.

NOTE: VZV is contagious and contact or airborne-spread from vesicle fluid may cause chickenpox in non-immune persons (i.e., no history of chickenpox or shingles and/or varicella seronegative). Non-immune healthcare workers should not take care of **patients** with VZV infection until all of the **patient's** lesions are dry and crusted. Localized herpes zoster has been reported to occur with increased frequency within the first 4 months after initiating **ART**, especially in those who experienced increases in their CD8 cells.

ETIOLOGY

Herpes zoster is caused by reactivation of VZV (i.e., reactivation of chickenpox).

SUBJECTIVE

1. May report numbness, itching or pain in a dermatomal distribution that precedes the appearance of lesions by many days (prodrome).

2. Complains of painful and/or itching skin blisters or ulcerations along one side of the face or body.
3. May complain of:
 - a. Severe pain in area after rash has healed.
 - b. Disseminated skin lesions.
 - c. Loss of or change in vision.
 - d. Respiratory symptoms.
 - e. Symptoms of encephalitis (e.g., headaches, vomiting, lethargy, ataxia, tremor and dizziness).
4. Conduct pain assessment using pain tool/scale (e.g., faces of pain or 0-10 numerical scale).
5. May report a history of:
 - a. Shingles.
 - b. Chickenpox.
6. Obtain a medication profile to determine whether or not there are any clinically significant drug-drug interactions with treatment.
NOTE: Medication profiles should include over-the-counter medications, herbals, vitamins and prescription medications.
7. Absence of drug allergies to acyclovir, valacyclovir or famciclovir.

OBJECTIVE

1. Vesicular lesions with erythematous bases following dermatomes; may be bullous, hemorrhagic and/or necrotic.
NOTE: Lesions in the eye area or tip of nose, along the trigeminal nerve, represent a therapeutic emergency.
2. May have allodynia (i.e., pain provoked by normally innocuous stimuli) and/or sensory deficits.
3. May have dermatomal scarring and/or hypopigmentation.
4. May or may not have signs of disseminated skin or visceral disease (e.g., respiratory signs, altered mental status).
5. Review previous lab results for evidence of renal impairment.

ASSESSMENT

Herpes Zoster

PLAN

DIAGNOSTIC STUDIES

Swabs from a fresh lesion can be submitted for viral culture, direct fluorescent antigen testing, or polymerase chain reaction (PCR).

THERAPEUTIC

PHARMACOLOGIC

1. If **patient** does not have clinical features of disseminated or visceral infection, and if lesions are not near the eye, begin treatment:
 - a. Acyclovir (Zovirax) by mouth 800 mg 5 times/day for 7-10 days,
OR
 - b. Famciclovir 500 mg by mouth three times/day for 7-10 days,
OR
 - c. Valacyclovir 1 gm by mouth three times/day for 7-10 days.

NOTE: Treatment should begin within 72 hours of outbreak. Prompt treatment should be instituted in all immunosuppressed **patients** with herpes zoster if presentation occurs within 1 week of rash onset or any time before full crusting of lesions. Famciclovir or valacyclovir are the recommended treatment for localized dermatomal herpes zoster. Dose reductions are required for **patients** with renal impairment. **Acyclovir resistant zoster has been reported in AIDS patients previously treated with acyclovir. If the patient does not respond to therapy or acyclovir resistance is known or suspected**, contact the provider for other options

2. For pain management: May instruct **patient** to try over-the-counter analgesics but to avoid aspirin because of the risk of Reye syndrome. **Patient** may require prescription analgesics.

NON-PHARMACOLOGIC

1. Bathe skin lesions in mild soap and water. Avoid deodorant astringent soaps. Use a separate cloth for bathing affected area to avoid dissemination. Pat skin dry without rubbing it.
2. A saline wet-to-dry dressing can be applied 2-3 times/day to debride necrotic tissue. Apply antibiotic ointments to aid in the prevention of secondary infection.

3. For **patients** with post-herpetic neuralgia, vigorous stimulation (e.g., brisk rubbing of the area with a towel) of the affected area may reduce pain.

PATIENT EDUCATION/COUNSELING

1. Inform **patient** that VZV is contagious, and contact or airborne spread from vesicle fluid may cause chickenpox in non-immune persons (i.e., no history of chickenpox or shingles). **Patient** should avoid exposing non-immune persons to VZV. If a non-immune HIV-infected person has been exposed, he/she should seek medical care as soon as possible (within 96 hours after exposure) to receive prophylactic treatment.
2. Review current drug regimen, including: drug storage, dose, route of administration, schedule, side effects and follow-up monitoring.
3. Instruct **patient** to report adverse drug reactions or side effects to his/her provider.
4. Instruct **patient** to report: signs/symptoms of disseminated disease, secondary infections (e.g., fever, worsening skin lesions), facial lesions, especially near eye or on tip of nose or recurrence of lesions to provider.
5. Explain that pain may continue even after skin lesions heal and **patient** should inform provider of continued pain.
6. Explain that recurrences may occur, and to notify **his/her** provider.
7. Ask female **patient** to inform **her** provider if she is, or is planning to become pregnant.

FOLLOW-UP

As needed, until lesions heal.

CONSULTATION/REFERRAL

1. Notify physician immediately if the **patient** has lesions on the face or near the eye. **Patient** may need STAT referral to an ophthalmologist.
2. Refer all **patients** with severe, disseminated or visceral infection, or renal impairment/failure to physician.
3. Consult with physician regarding appropriate pain management.

4. Consult physician if signs/symptoms of secondary infection are present.
5. Refer pregnant **patients** to physician.

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STANDARD NURSE PROTOCOL FOR ORAL CANDIDIASIS IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION	Oral candidiasis is the most common superficial fungal infection in HIV-infected persons. There are four clinical presentations in people with HIV: pseudomembranous, erythematous (atrophic), hyperplastic and angular cheilitis.
ETIOLOGY	Primarily caused by an overgrowth of <i>Candida albicans</i> , and less often by other <i>Candida</i> species, <i>C. tropicalis</i> , <i>C. krusei</i> , <i>C. glabrata</i> and/or <i>C. parapsilosis</i> .
SUBJECTIVE	<ol style="list-style-type: none">1. May or may not be symptomatic.2. May or may not complain of: white patches on tongue and oral mucosa, smooth red areas on dorsal tongue, burning or painful mouth areas, changes in taste sensation, sensitivity to spicy foods and/or decreased appetite.3. May or may not have a history of oral or esophageal candidiasis.4. Absence of signs/symptoms of esophageal candidiasis (e.g., patient does not report painful swallowing, retrosternal pain, and nausea).5. Absence of allergies to antifungal agents.6. Obtain a medication profile to determine whether or not there are any clinically significant drug-drug interactions with treatment. <p>NOTE: Medication profiles should include over-the-counter medications, herbals, vitamins and/or prescription medications.</p>
OBJECTIVE	May have patches/lesions anywhere on the hard and soft palates, under the tongue, on the buccal mucosa or gums or extending back into the posterior pharynx. These lesions or forms of oral candidiasis can be further classified as follows: <ol style="list-style-type: none">1. Pseudomembranous candidiasis (thrush) appears as white plaques, which can be scraped off with a tongue depressor, revealing a bleeding, macerated surface below them. Lesions may be as small as 1-2 mm in size, or extensive plaques covering the entire hard palate.

2. Erythematous candidiasis (atrophic candidiasis) is a red, flat lesion or lesions on the palate and/or dorsal tongue surface. The tongue may have depapillated red mucosal areas on its dorsal surface.
3. Angular cheilitis (not exclusively due to *Candida*) presents with fissuring and redness at either one or both corners of the mouth, and may appear alone or in conjunction with another form of oral *Candida* infection.
4. Hyperplastic candidiasis (*Candida* leukoplakia) presents as firm, adherent white lesions often found bilaterally on the tongue. May be more resistant to therapy than other forms of candidiasis.

ASSESSMENT Oral Candidiasis

PLAN **THERAPEUTIC**

1. Mild to Moderate Cases

NOTE: The **patient** should not take anything else orally for 30 minutes after using the following topical agents. Adherence to these regimens is often poor because of time requirements.

- a. Clotrimazole one troche (10mg) dissolved in mouth 5 times/day for 14 days,

OR

- b. Nystatin premixed suspension (100,000 units/ml) swish 4-6 ml for 5 minutes and swallow, 4-5 times per day for 14 days.

NOTE: Nystatin premixed suspension has a high sugar content (suspension is 33-50% sucrose) and may increase the incidence of dental caries. If Nystatin suspension is used for long periods, refer **patient** to dentist for fluoride rinses to decrease the incidence of dental caries.

OR

- c. Paddock Nystatin Powder (this is sugar-free) - mix 1/8 teaspoon (500,000 units) in 4-6 ounces of water and swish and swallow 4 times/day for 14 days.

NOTE: This product contains no preservatives and therefore should be used immediately after mixing and should not be stored. It is designed for extemporaneous preparation of a single dose at a time.

2. Severe Cases
Fluconazole **200mg** (two 100mg tablets) PO x 1, then 100 mg tablet PO daily for 14 days.

NOTE: Treatment with fluconazole can result in selective growth of non-*Candida* species, and should only be implemented when necessitated by more severe disease. Oral candidiasis can develop resistance to fluconazole. Fluconazole may interact with other medications. Review the **patient's** current medication list, including OTC drugs/products and nutritional or herbal supplements, and check for drug-drug interactions.

3. Maintenance Therapy (Frequent or Severe Recurrences)
 - a. Clotrimazole one 10 mg troche dissolved in mouth 3 times/day,
OR
 - b. Fluconazole 100 mg tablet by mouth daily,
OR
Fluconazole 100 mg by mouth three times/week.

NOTE: Use fluconazole with caution when considering chronic maintenance therapy because it has been associated with refractory and azole-resistant candidiasis.

4. Angular cheilitis
 - a. 2% ketoconazole cream applied to affected area two times/day for 14 days,
OR
 - b. 1% clotrimazole cream applied to affected area two times/day for 14 days.

PATIENT EDUCATION/COUNSELING

1. Instruct **patient** to maintain good oral hygiene and to avoid mouth trauma (e.g., use a soft toothbrush, don't eat food or drink liquids that are too hot in temperature or too spicy).
2. Rinse mouth of all food before using topical agents and take nothing by mouth for 30 minutes after using agents.
3. Explain reason for regimen. Review current drug regimen, including: drug storage, dose, route of administration, schedule, side effects and follow-up monitoring.
4. Explain that he/she may need maintenance therapy because frequent relapse is common, and to notify **his/her** provider if condition worsens, does not improve or if relapse occurs.

5. For **patients** who have candidiasis under dentures or partial denture plates, instruct to:
 - a. Remove prosthesis before use of topical agents, such as clotrimazole or Nystatin.
 - b. At bedtime, place the prosthesis in a chlorhexidine solution, then apply a thin coating of Nizoral cream on the acrylic portion of the appliance until reinserting it into the mouth.
6. Ask female **patient** to inform **her** provider if she is or is planning to become pregnant. If taking fluconazole, instruct to stop taking this medication and notify provider.
7. Instruct **patients** who are on long-term oral Nystatin suspension to maintain good oral hygiene and to rinse with topical fluoride daily.
8. If the **patient** is taking fluconazole, ask **patient** to check with his/her pharmacist or provider about interactions before taking a new medication, nutritional or herbal supplement or OTC drug/product.

FOLLOW-UP

1. Routine appointments **with provider**, as indicated, at least every 3-6 months.
2. For **patients** taking fluconazole, monitor liver and renal function and serum potassium every 6-12 weeks.

CONSULTATION/REFERRAL

1. Notify physician of the following:
 - a. Severe or unresponsive candidiasis.
 - b. Abnormal lab results, as indicated.
 - c. Suspect esophageal candidiasis (e.g., **patient** reports painful swallowing, retrosternal pain, and nausea).
2. Refer pregnant **patients** to a physician.

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STANDARD NURSE PROTOCOL FOR OROLABIAL HERPES SIMPLEX IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION Herpes simplex virus (HSV) primarily infects the orolabia (i.e., mouth and lips), genitals, and anorectal area. In addition, HSV can infect the esophagus, brain, and retina.

Infections with HSV type 1 (HSV-1) and type 2 (HSV-2) are common. Initial infection with HSV-1 usually occurs in childhood. Approximately 95% of HIV-infected persons are seropositive for either HSV-1 or HSV-2 and 70% are seropositive for HSV-2. Severity and frequency of HSV recurrence may increase with advancing immunosuppression.

Primary infection of the orolabial area with HSV in the immunocompetent **patient** is usually asymptomatic. HIV-infected **patients** with immunosuppression may present with painful vesicular eruptions of the lip, tongue, pharynx, and buccal mucosa. These vesicles quickly rupture and become ulcers. Associated signs and symptoms include fever, malaise, cervical lymphadenopathy, and pharyngitis.

Recurrent HSV infection usually presents as small vesicles that ulcerate and may coalesce to form large ulcers. In immunocompetent HIV-infected **patients**, ulcers usually resolve within 7-10 days. In immunosuppressed HIV-infected **patients**, HSV infection may be persistent, painful and/or expand to form large, crusted erosions. It also may not respond to routine therapy in HIV-infected **patients**.

ETIOLOGY Primary infection, or recurrent disease from latent infection, with herpes simplex virus, type-1 (HSV-1) or type-2 (HSV-2).

SUBJECTIVE

1. Painful blisters followed by ulcers on lips and/or in mouth.
2. May or may not have:
 - a. Prodrome of tingling and numbness at the site 12-24 hours before blisters occurred.
 - b. Fever.
 - c. Uneasiness.
 - d. Swollen lymph nodes in neck.
 - e. Sore throat.
 - f. Persistent ulcers or large crusted erosion.
 - g. Severe pain.
 - h. Symptoms of encephalitis (e.g., headaches, vomiting, lethargy, ataxia, tremor and dizziness).

3. May have a history of:
 - a. Cold sores/fever blisters or genital herpes/ulcers.
 - b. Partner with cold sores/fever blisters or genital herpes/ulcers.
4. Obtain a medication profile to determine whether or not there are any clinically significant drug-drug interactions with treatment.
NOTE: Medication profiles should include over-the-counter medications, herbals, vitamins and prescription medications.
5. Absence of allergies to acyclovir, valacyclovir or famciclovir.
6. Review previous lab results for evidence of renal impairment.

OBJECTIVE

1. Grouped vesicles and/or large ulcer(s) with scalloped border covered by whitish-yellow film over the oral mucosa and/or perioral area **OR** may have atypical presentation in late stage HIV disease.
2. May have:
 - a. Cervical lymphadenopathy.
 - b. Swelling and/or erythema of oral mucosa and/or pharynx.
 - c. Large, crusted erosion.
 - d. Altered mental status.
3. Recent CD4 counts.

ASSESSMENT

Orolabial herpes simplex

PLAN

DIAGNOSTIC STUDIES

May order HSV viral culture, serology, or polymerase chain reaction (PCR) assay.

THERAPEUTIC

1. Most cases resolve within 7-10 days and do not require therapy.
2. In severely immunosuppressed and/or severe prolonged recurrent episodes consider the following therapy:
 - a. Acyclovir 400 mg by mouth three times/day for 5-10 days,
OR
 - b. Valacyclovir 1 gm by mouth two times/day for 5-10 days,
OR
 - c. Famciclovir 500 mg by mouth two times/day for 5-10 days.

NOTE: Dose reductions of these medications are required for **patients** with renal impairment. Acyclovir resistance may occur.

3. For suppressive therapy of frequent or severe recurrences:
 - a. Acyclovir 400 mg by mouth two times/day indefinitely,
OR
 - b. Famciclovir 500 mg by mouth two times/day indefinitely,
OR
 - c. Valacyclovir 500 mg by mouth two times/day indefinitely.

NOTE: Dose reductions of these medications are required for **patients** with renal impairment. Acyclovir resistance may occur.

4. May use topical anesthetics (e.g., xylocaine or lidocaine) or mucosal coating agents (e.g., milk of magnesia).

PATIENT EDUCATION/COUNSELING

1. Inform **patient** that HSV can be transmitted to other persons. Therefore, other persons should avoid direct contact with open lesions (e.g., no kissing, no sharing eating utensils, no sharing personal hygiene items and no oral-genital sex).
2. Review current drug regimen including: drug storage, dose, route of administration, schedule, side effects and follow-up monitoring.
3. Instruct **patient** to report adverse drug reactions or side effects to his/her provider.
4. Instruct **patient** to report persistent ulcers, secondary infections and/or continued pain to **his/her** provider. Instruct **patient** to return in 2 weeks if ulcers do not resolve.
5. Explain to **patient** that recurrences may occur and to notify **his/her** provider.
6. Ask female **patient** to inform **her** provider if she is or is planning to become pregnant.

FOLLOW-UP

As needed, if lesions do not heal.

CONSULTATION/REFERRAL

1. **Patients reporting symptoms of encephalitis (e.g., headaches, vomiting, lethargy, ataxia, tremor, and dizziness) and/or exhibiting altered mental status should be immediately referred to the physician (patient may require hospitalization).**

2. Refer severe or persistent cases to physician.
3. Consult physician concerning need for suppressive therapy.
4. Refer pregnant **patients** to physician.

REFERENCES

1. **Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents**
http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi_041009.pdf
(March 8, 2013).
2. **Health Resources and Services Administration**, “Herpes Simplex, Mucocutaneous,” *Clinical Manual for the Management of the HIV-Infected Adult*, 2011, updated January 2011, (March 8, 2013).
3. **John Bartlett and Joel Gallant**, *2012 Medical Management of HIV Infection*, **Johns Hopkins University**, 2012, pp. 447-449 (March 8, 2013).
4. Dental Alliance for AIDS/HIV Care, *Principles of Oral Health Management for the HIV/AIDS Patient*, 2000,
<http://www.aidsetc.org/pdf/curricula/Princ_Oral_Health_HIV.pdf> (March 8, 2013). (Current)
5. Kenneth Zwolski, Carl Kirton, et al. (eds.), “Viral Infections,” *Handbook of HIV/AIDS Nursing*, Mosby, St Louis, 2001, pp. 305-311. (Current)

STANDARD NURSE PROTOCOL FOR PCP PROPHYLAXIS IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION/ INDICATIONS

Pneumocystis jiroveci pneumonia (PCP) prophylaxis is treatment given to HIV-infected individuals to prevent either a primary episode or recurrence of PCP. According to the CDC, *P. carinii* is now exclusive to the pneumocystis that infects rodents and *P. jiroveci* refers to the species that infects humans. However, the abbreviation remains PCP.

Primary prophylaxis (prevention of first episode) should be administered to all HIV-infected persons with a CD4 count of less than 200/mm³ and/or a history of oropharyngeal candidiasis. PCP prophylaxis should be considered in HIV-infected persons with a CD4 percentage of less than 14% or a history of an acquired immunodeficiency syndrome (AIDS)-defining illness, who does not otherwise qualify.

Secondary prophylaxis (prevention of recurrence) should be administered to HIV-infected **patients** who have a history of a previous PCP episode for life unless immune reconstitution occurs as a consequence of **antiretroviral therapy (ART)**.

Both primary and secondary prophylaxis may be discontinued in **patients** who have responded to **ART** and have sustained CD4 counts greater than 200/mm³ for 3 months or more (immune reconstitution). Primary prophylaxis and secondary prophylaxis should be reintroduced if the CD4 count decreases to less than 200/mm³ and secondary prophylaxis should be reintroduced if PCP recurs at a CD4 count of greater than 200/mm³.

ETIOLOGY

Pneumocystis jiroveci is a fungal organism acquired through inhalation. PCP in HIV-infected persons is usually caused by reactivation of latent *P. jiroveci* organisms.

SUBJECTIVE

1. May or may not have a history of:
 - a. Previous PCP episode.
 - b. Oropharyngeal candidiasis.
 - c. An AIDS-defining illness.
2. No history of active tuberculosis (TB).
3. No complaints of symptoms suggestive of PCP (e.g., non-productive cough, fever, shortness of breath).

4. Absence of allergies to sulfa drugs, dapsone, pyrimethamine and/or atovaquone.
5. Obtain a medication profile to determine whether or not there are any clinically significant drug-drug interactions with treatment.

NOTE: Medication profiles should include: over-the-counter and prescription medications, herbals and vitamins.

OBJECTIVE

1. CD4+ cell count less than $200/\text{mm}^3$ and/or CD4+ percent less than 14%.
2. May or may not have oropharyngeal candidiasis.
3. Absence of pulmonary signs and symptoms (e.g., tachypnea).
4. Complete blood count (CBC), renal and liver function and serum potassium within acceptable values.
5. Absence of Glucose-6-Phosphate Dehydrogenase (G6-PD) deficiency. (If **patient** has G6-PD deficiency, refer to physician for prophylaxis medication.)

ASSESSMENT

Candidate for PCP Prophylaxis (primary or secondary); at risk for PCP.

PLAN

THERAPEUTIC/PHARMACOLOGIC

1. First Choice
 - a. Trimethoprim-sulfamethoxazole* (TMP-SMZ) one double-strength (DS) tablet by mouth daily[†],
 - OR**
 - b. TMP-SMZ* one single-strength (SS) tab by mouth daily[†].
2. Alternative
 - a. TMP-SMZ* one DS tablet by mouth 3 times per week[†] (e.g., Monday, Wednesday, Friday)
 - OR**
 - b. Dapsone Regimens
 - 1) Dapsone 50 mg by mouth two times/day or 100 mg by mouth daily[‡],
 - OR**

- 2) Dapsone 200 mg by mouth once per week,
PLUS
Pyrimethamine 75 mg by mouth once per week,
PLUS
Leucovorin 25 mg by mouth once per week[†],
OR
- 3) Dapsone 50 mg by mouth daily,
PLUS
Pyrimethamine 50 mg by mouth once per week,
PLUS
Leucovorin 25 mg by mouth once per week[†],
OR
- c. Aerosolized pentamidine (AP) 300 mg once per month via
Respirgard II™ nebulizer^{‡§},
OR
- d. Atovaquone suspension 1500 mg by mouth daily[¶].

LEGEND

* Many **patients** become intolerant of sulfa medications. Severe reactions may include: persistent neutropenia, fever, renal failure, severe erythroderma and Stevens-Johnson syndrome (bullae & desquamation of the skin). Some **patients** with milder reactions can be desensitized.

[†]Regimen is also effective against toxoplasmosis.

[‡]This regimen is not recommended for prevention of toxoplasmosis.

[§]AP may increase the risk of extrapulmonary pneumocystosis, pneumothorax and bronchospasm. It increases risk of TB transmission to others if **patient** has active pulmonary tubercular disease, unless ventilation (negative pressurized facility with outside venting) is adequate. Do not use in **patients** in whom TB is suspected.

[¶]Very expensive and should not be used if other alternatives are available.

PATIENT EDUCATION/COUNSELING

1. Explain reason for regimen. Review current drug regimen including: drug storage, dose, route of administration, schedule, side effects and follow-up monitoring.
2. Instruct **patient** to stop medications immediately and report adverse drug reactions or side effects (e.g., unusual bleeding or bruising, changes in skin color, sore throat, rash, high fever) to his/her care provider. Also report other changes in health that he/she feels are important.

3. Instruct that taking medications as ordered, or keeping appointments for pentamidine treatments, is very important to prevent this life-threatening form of pneumonia.
4. Explain that prophylaxis may be discontinued due to sustained rise in CD4 count while on **ART**, but may need to be re-started in the event of stopping **ART**, CD4 counts dropping or if health condition worsens.
5. Inform the **patient** that PCP can occur or recur in spite of prophylaxis and to call his/her provider if develop a cough, fever and shortness of breath on exertion.
6. Ask female **patient** to inform **her** provider if she is, or is planning to become pregnant.
7. Inform **patient** that regular blood tests are necessary during therapy.
8. Explain that TMP-SMZ may cause increased sensitivity to sunlight and instruct to wear sunblock, protective clothing and dark glasses or avoid direct exposure to sunlight.

FOLLOW-UP

1. Monitor for medication adherence, adverse drug events and medication side effects.
2. Obtain and monitor complete blood count (CBC), renal and liver function, and serum potassium within 4-6 weeks of initiation of regimen, and then as indicated.
3. Monitor for signs/symptoms of PCP.
4. Obtain and monitor CD4 counts and percentage at least every 3-6 months.

CONSULTATION/REFERRAL

1. Notify the physician of the following:
 - a. Abnormal lab values.
 - b. Medication side effects and/or adverse events.
 - c. Signs/symptoms of PCP.

2. Defer prophylaxis medication decision for G6-PD deficient **patients** to physician.
3. Defer decision to discontinue primary or secondary prophylaxis to physician.
4. Refer pregnant **patients** to the physician.

REFERENCES

1. **Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents**
http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi_041009.pdf
(March 8, 2013).
2. American Academy of HIV Medicine for the HIV Specialist, (2007), "Pneumocystis Pneumonia", AAHIVM, Washington D.C., 2007, pp 361-366. **(Current)**
3. **Health Resources and Services Administration**, "Opportunistic Infection Prophylaxis," *Guide for HIV/AIDS Clinical Care*, 2011,
<http://hab.hrsa.gov/deliverhivaidscares/clinicalguide11/> (March 8, 2013).
4. **John Bartlett and Joel Gallant, 2012 Medical Management of HIV Infection, Johns Hopkins University, 2012, pp. 477-480 (March 8, 2013).**
5. Carl Kirton, et al., *Handbook of HIV/AIDS Nursing*, Mosby, St Louis, 2001. **(Current)**

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STANDARD NURSE PROTOCOL FOR SEBORRHEIC DERMATITIS IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION	Seborrheic dermatitis is a skin condition commonly seen in HIV-infected persons. It is chronic and usually undergoes periods of exacerbation and remission. The condition occurs in areas where sebaceous glands are concentrated, including the scalp, eyebrows, nasolabial folds, forehead, cheekbones, ears, hairline, chest, axilla and groin.
ETIOLOGY	The probable cause of seborrhea is a yeast, <i>Pityrosporum ovale</i> (<i>Malassezia</i>). Pathogenesis appears to be inflammatory and may be triggered by allergic response to colonizing microorganisms on the skin.
SUBJECTIVE	<ol style="list-style-type: none">1. May or may not report rash, sometimes itchy, or "dry skin" that will not go away in spite of the application of topical moisturizers.2. May or may not have a history of dandruff and/or seborrheic dermatitis.
OBJECTIVE	<ol style="list-style-type: none">1. Fine white scaling, without erythema, affecting the scalp (dandruff), AND/OR2. Scaly/crusty patches and plaques of erythema with indistinct margins and yellowish, greasy scale affecting one or more of the following areas: scalp, eyebrows, nose, nasolabial folds, forehead, cheekbones, ears, hairline, chest, breast folds, axilla, back and/or groin.
ASSESSMENT	Probable Seborrheic Dermatitis
PLAN	DIAGNOSTIC STUDIES May perform a potassium hydroxide (KOH) preparation to rule out <i>Candida albicans</i> and other superficial yeast infections. THERAPEUTIC <ol style="list-style-type: none">1. For scalp conditions:<ol style="list-style-type: none">a. Regular use of an over-the-counter dandruff shampoo that contains sulfur and salicylic acid (e.g., Van Seb, Sebulex), selenium sulfide (e.g., Selsun Blue), ketoconazole (e.g., Nizoral), coal tar, OR zinc pyrithione (e.g., Head and Shoulders, Danex, Zincon). Instruct patient to shampoo daily until condition resolves (usually several weeks), then once or twice a week.

OR

- b. Nizoral 2% shampoo (prescription strength) twice per week for 4 weeks. Instruct **patient** to wet hair, massage well into scalp, leave it for 3-5 minutes, and then rinse thoroughly. After the first 4 weeks, use once every 1-2 weeks to prevent recurrence of dandruff.

OR

- c. If shampoo alone is not adequate, a medium-potency topical corticosteroid solution (e.g., triamcinolone 0.1% applied two times/day to the scalp) may be used.

NOTE: Avoid application of medium-potency topical steroids to the face.

2. For other lesions:

Topical 2% ketoconazole cream applied to affected area two times/day until condition resolves, then as needed, two times/day

PLUS

Topical 1% to 2.5% hydrocortisone cream, lotion or ointment to affected area two times/day until condition resolves, then 1% hydrocortisone two times/day as needed.

NOTE: For mild disease, maintenance therapy may consist of 1% hydrocortisone cream

PLUS

2% ketoconazole cream applied only twice weekly or, rarely, once daily.

PATIENT EDUCATION/COUNSELING

1. Explain reason for regimen. Review current drug regimen including: drug storage, dose, route of administration, schedule, side effects and follow-up monitoring. Include the following:
 - a. Treatment is for external use only; use exactly as ordered, and do not overuse.
 - b. If using special shampoo, follow directions and leave it on the recommended amount of time. Allow shampoo suds onto affected facial areas when possible.
 - c. Do not apply topical therapy to open wounds or weeping areas.
 - d. Wash and dry area before applying topical creams, ointments, or lotions.
 - e. Avoid contact with eyes.
 - f. If using topical corticosteroid (e.g., hydrocortisone), avoid exposing treated area to direct sunlight, as it may become sunburned.

2. Explain that seborrheic dermatitis is a chronic condition, which often recurs. **Patients** should keep their skin as clean and dry as possible, and watch for recurrences, particularly in winter due to dry heat.
3. At the earliest sign of recurrence, instruct **patient** to restart shampoo and/or topical therapy to prevent progression and secondary infection.
4. Instruct **patient** to inform provider if condition worsens or does not improve, or if he/she has signs of secondary infection.
5. Ask female **patient** to inform **her** provider if she is, or is planning to become, pregnant.

FOLLOW-UP

Routine appointments **with provider** as indicated, at least every 3-6 months.

CONSULTATION/REFERRAL

1. Notify physician of the following:
 - a. Severe or recalcitrant episodes.
 - b. Secondary infection is suspected.
2. Refer pregnant **patients** to physician.

REFERENCES

1. **Health Resources and Services Administration**, "Seborrheic Dermatitis," *Guide for HIV/AIDS Clinical Care*, 2011, (March 8, 2013). (Current)
2. **John Bartlett and Joel Gallant**, *2012 Medical Management of HIV Infection*, Johns Hopkins University, 2012, pp. 492-497 (March 8, 2013).
3. Timothy Berger, Merle Sande and Paul Volberding, (eds.), "Dermatologic Care of the AIDS Patient," *The Medical Management of AIDS*, 6th ed., W.B. Saunders Company, Philadelphia, 1999, pp. 186-194. (Current)
4. Jill Handel, Carl Kirton, et al. (eds.), "Dematological Care of Clientss with HIV/AIDS," *Handbook of HIV/AIDS Nursing*, Mosby, St Louis, 2001, pp. 325-326. (Current)

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STANDARD NURSE PROTOCOL FOR TOXOPLASMOSIS PROPHYLAXIS IN HIV-INFECTED ADULT OR ADOLESCENT

DEFINITION/ INDICATION

All HIV-infected persons should be tested for IgG antibody to *Toxoplasma* soon after HIV diagnosis. Persons found to be *Toxoplasma*-seropositive and have CD4 counts less than $100/\text{mm}^3$ should be administered primary prophylaxis to prevent toxoplasmic encephalitis (TE).

HIV-infected persons who have completed initial treatment for TE should be administered secondary prophylaxis (chronic maintenance therapy) for life, unless immune reconstitution occurs due to **antiretroviral therapy (ART)**.

Primary prophylaxis should be discontinued in **patients** who have responded to **ART** and have sustained CD4 counts greater than $200/\text{mm}^3$ for 3 months or more (immune reconstitution). Primary prophylaxis should be restarted if the CD4 count decreases to less than $100\text{-}200 \text{ mm}^3$.

Secondary prophylaxis should be discontinued in **patients** who completed initial therapy for TE, have responded to **ART** and have sustained CD4 counts greater than $200/\text{mm}^3$ for 6 months or more (immune reconstitution), and are asymptomatic for TE. Secondary prophylaxis should be restarted if the CD4 count decreases to less than 200 mm^3 .

ETIOLOGY

Toxoplasma gondii is a protozoan organism commonly found in cats, mammals and birds. People become infected by ingesting contaminated, undercooked meat or vegetables, by handling contaminated cat litter, or by gardening or other contact with soil. *T. gondii* can infect any tissue, but the most common sites are the brain, lungs and eyes. In immunocompetent persons the infection is usually controlled, but a small number of organisms survive. Immunodeficiency is the most common cause of reactivation of latent infection.

SUBJECTIVE

1. May or may not have a history of TE and treatment for TE.
2. No history/complaints of neurological symptoms suggestive of TE (e.g., seizures, altered mental status, motor weakness, headaches, and/or cognitive impairment).
3. Absence of allergies to sulfa drugs, dapsone, pyrimethamine, atovaquone and/or clindamycin.

4. Obtain a medication profile to determine whether or not there are any clinically significant drug-drug interactions with treatment.

NOTE: Medication profiles should include over-the-counter medications, herbals, vitamins and prescription medications.

OBJECTIVE

1. *Toxoplasma* seropositive.
2. CD4 count less than 100/mm³.
2. Absence of neurological signs of TE (e.g., altered mental status, aphasia, ataxia, hemiparesis and cranial nerve palsies).
3. Complete blood count (CBC), renal and liver function and serum potassium within acceptable values.
4. Absence of Glucose-6-Phosphate Dehydrogenase (G6-PD) deficiency. (If G6-PD-deficient, refer to physician for prophylaxis medication.)

ASSESSMENT

Candidate for toxoplasmosis prophylaxis (primary or secondary); at risk for activation of latent toxoplasmosis infection.

PLAN

THERAPEUTIC

1. Primary Prophylaxis (Prevention of TE)
 - a. First Choice
Trimethoprim-sulfamethoxazole* (TMP-SMZ) one double strength (DS) tablet by mouth daily[†],
OR
 - b. Alternative
 - 1) TMP-SMZ* one single strength (SS) tab by mouth daily[†],
OR
 - 2) Dapsone Regimens[†]
 - a) Dapsone 200 mg by mouth once per week,
PLUS
Pyrimethamine 75 mg by mouth once per week,
PLUS
Leucovorin 25 mg by mouth once per week,
OR
 - b) Dapsone 50 mg by mouth daily,
PLUS
Pyrimethamine 50 mg by mouth once per week.
PLUS

- Leucovorin 25 mg by mouth once per week.
OR
- 3) Atovaquone Regimens^{†‡}
- a) Atovaquone 1500mg by mouth daily,
OR
- b) Atovaquone 1500 mg by mouth daily,
PLUS
Pyrimethamine 25 mg by mouth daily,
PLUS
Leucovorin 10 mg by mouth daily.
3. Secondary Prophylaxis (Chronic Maintenance Therapy)
- a. First Choice
- Sulfadiazine* 500-1000 mg by mouth 4 times/day,
PLUS
Pyrimethamine 25-50 mg by mouth daily,
PLUS
Leucovorin 10-25 mg by mouth daily[¶],
OR
- b. Alternative
- 1) Clindamycin[§] **600** mg by mouth every 8 hours,
PLUS
Pyrimethamine 25-50 mg by mouth daily,
PLUS
Leucovorin 10-25 mg by mouth daily[¶],
OR
- 2) Atovaquone Regimens^{†‡}
- a) Atovaquone 750mg by mouth every 6-12 hours,
OR
- b) Atovaquone 750mg by mouth every 6-12 hours,
PLUS
Pyrimethamine 25 mg by mouth daily,
PLUS
Leucovorin 10 mg by mouth daily.

LEGEND

*Many **patients** become intolerant of sulfa medications. Severe reactions may include persistent neutropenia, fever, renal failure, severe erythroderma and Stevens-Johnson syndrome (bullae & desquamation of the skin). Some **patients** with milder reactions can be desensitized.

[†]Regimen is also effective against PCP.

[‡]Very expensive and should not be used if other alternatives are available.

[§]Clindamycin may cause colitis.

[¶]This regimen is not recommended for the prevention of PCP.

PATIENT EDUCATION/COUNSELING

1. Explain reason for regimen. Review current drug regimen including: dose, drug storage, route of administration, schedule, side effects, and follow-up monitoring.
2. Instruct **patient** to stop medications immediately and report adverse drug reactions or side effects (e.g., unusual bleeding or bruising, changes in skin color, sore throat, rash, high fever) to his/her provider. Also report other changes in health that he/she feels are important.
3. Instruct that taking medications as ordered is very important to prevent this life-threatening illness.
4. Explain that prophylaxis may be discontinued due to sustained rise in CD4 count while on **ART**, but may need to be re-started in the event of stopping **ART** or if CD4 counts drop.
5. Instruct **patient** to report any neurological signs/symptoms to provider.
6. Ask female **patient** to inform **her** provider if she is, or is planning on becoming, pregnant.
7. Inform **patient** that regular blood tests are necessary during therapy.
8. If taking TMP-SMZ or sulfadiazine, explain that these medications may cause increased sensitivity to sunlight and instruct to wear sunblock, protective clothing and dark glasses, or avoid direct exposure to sunlight.

FOLLOW-UP

1. Monitor for medication adherence, adverse drug events and medication side effects.
2. Monitor complete blood count (CBC), renal and liver function, and serum potassium within 4-6 weeks of initiation of regimen, and then as indicated.
3. Monitor CD4 counts and percentage at least every 3-6 months.
4. Monitor for signs/symptoms of TE.

CONSULTATION/REFERRAL

1. Notify the physician of the following:
 - a. Abnormal lab values.
 - b. Medication side effects and/or adverse events.
 - c. Signs/symptoms of TE.
2. Defer decision to discontinue primary or secondary prophylaxis to physician.
3. Refer pregnant **patients** to the physician.

REFERENCES

1. **Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents**
http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi_041009.pdf
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2. **Health Resources and Services Administration**, "Opportunistic Infection Prophylaxis," *Clinical Guide for HIV/AIDS Care*, 2011, (March 8, 2013).
3. American Academy of HIV Medicine for the HIV Specialist, "Protozoan/Parasitic Infections: Toxoplasmosis," AAHIVM, Washington D.C., 2007, pp. 375-377. (Current)
4. **John Bartlett and Joel Gallant**, *2012 Medical Management of HIV Infection*, Johns Hopkins University, 2012, pp. 492-497 (March 8, 2013).
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