National HIV Curriculum

Pneumocystis Pneumonia: Prevention

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Pneumocystis pneumonia (PCP) Prevention: Outline

- Background and Rationale
- Prevention of Pneumocystis pneumonia
- Criteria for starting and stopping prophylaxis
- Prophylaxis options
- Medication side effects
- Summary

Background and Rationale

Background - *Pneumocystis* Pneumonia

- Major cause of pneumonia in PWH when CD4 count <200 cells/mm^3
- Caused by the ubiquitous fungus, *Pneumocystis jiroveci*
- Airborne transmission
- Disease occurs by new acquisition vs reactivation of latent infection
- Symptoms include fever, hypoxia, dyspnea, non-productive cough

Prevention of *Pneumocystis* Pneumonia

Indications for Initiating Primary Prophylaxis for PCP*

- CD4 cell count <200 cells/mm^3, *or*
- CD4 percentage <14%, *or*
- CD4 count >200 but <250 cells/mm^3 IF ART is delayed and frequent CD4 monitoring is not feasible

*Individuals receiving treatment for toxoplasmosis with sulfa-containing drugs do not require additional PCP prophylaxis

Source: HHS. Opportunistic Infections Guidelines. Pneumocystis pneumonia. January 2023.

Pneumocystis Prevention: Options for Prophylaxis

Drug	Notes
Trimethoprim-sulfamethoxazole	• (preferred) DS tab daily • (preferred) SS tab daily effective & may be better tolerated • DS tab 3 times per week also effective
Dapsone	• Check G6PD level prior to use • Can be taken by itself or • Can be taken with pyrimethamine and leucovorin, but is more expensive regimen
Atovaquone	• Liquid, bad taste • Can be taken by itself or • Can be taken with pyrimethamine and leucovorin, but this regimen is more expensive
Inhaled pentamidine	• Dosed once monthly • Unable to use in patients with underlying pulmonary problems • Needs to be administered in a clinic or hospital setting

Source: HHS. Opportunistic Infections Guidelines. Pneumocystis pneumonia. January 2023.

When to Discontinue Primary Prophylaxis for PCP

- CD4 cell count ≥200 cells/mm^3 for at least 3 months after ART initiation
- Can consider if CD4 is between 100-200 cells/mm^3 *and* viral suppression on ART for at least 3-6 months

Source: HHS. Opportunistic Infections Guidelines. Pneumocystis pneumonia. January 2023.

When to Restart Primary Prophylaxis for PCP

- CD4 count <100 cells/mm^3 regardless of viral load, *or*
- CD4 count is between 100-200 cells/mm^3 *and* detectable viral load

Source: HHS. Opportunistic Infections Guidelines. Pneumocystis pneumonia. January 2023.

Side Effects of Medications Used for PCP Prophylaxis

Potential side effects of medications used for PCP prophylaxis

Medication	Potential Side Effects
TMP-SMX	Renal dysfunction Hyperkalemia Leukopenia Rash Hepatitis
Dapsone	Hemolytic anemia (if used in patients with G6PD deficiency) Contains sulfonamide*
Inhaled Pentamidine	Cough Bronchospasm
Atovaquone	Bad taste
Pyrimethamine	Nausea & vomiting Bone marrow suppression (if not co-administered with leucovorin)

*Potential for cross-reactivity with other sulfa-containing drugs; dapsone not contraindicated in patients with sulfonamide allergy

Summary

PCP Primary Prophylaxis: Editor's Summary

- PCP prophylaxis is indicated in all PWH with a CD4 <200 cells/mm^3
- The preferred drug for PCP prophylaxis is TMP-SMX
- Alternative therapies include:
  - Dapsone +/- pyrimethamine and leucovorin
  - Atovaquone +/- pyrimethamine and leucovorin
  - Aerosolized pentamidine
- Always check the G6PD level prior to dapsone use
- Using dapsone in someone with TMP-SMX intolerance depends on severity of reaction to TMP-SMX
- Prophylaxis can usually be discontinued once immune reconstitution has occurred on ART

Source: HHS. Opportunistic Infections Guidelines. Pneumocystis pneumonia. January 2023.

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