

Wilbur, a 55-year-old male client, presents to the NP complaining of a flat, purple-colored rash on his back and chest. Wilbur states the rash is not painful or itchy. He states it has been there for months, and he has also developed a white coating on his tongue and has “been sick a lot lately.”

- a. Discuss the underlying pathophysiological mechanisms of your assigned disease process (HIV). Which clinical manifestations observed in Wilbur’s case may be explained by the pathophysiological mechanisms?

Human Immunodeficiency Virus (HIV), first identified in 1983, is a retrovirus that primarily targets the immune system, specifically CD4+ T lymphocytes, macrophages, and dendritic cells. The virus enters host cells by binding to the CD4 receptor and co-receptors, then fuses with the cell membrane. Once inside the cell, HIV uses reverse transcriptase (enzyme) to convert viral RNA into DNA, which is then integrated into the host genome via integrase. This allows the virus to replicate whenever the host cell is activated (NIH, 2024). Over time, continuous viral replication leads to progressive destruction and dysfunction of CD4+ T cells, resulting in impaired cell-mediated immunity. As CD4 counts decline, the immune system becomes increasingly unable to control infections, malignancies, and latent viruses. Chronic immune activation and inflammation further contribute to immune exhaustion and disease progression. Without treatment, this process eventually leads to Acquired Immunodeficiency Syndrome (AIDS), characterized by opportunistic infections and AIDS-defining illnesses (Bekker et al., 2023; CDC, 2023).

Several of Wilbur’s presenting symptoms are consistent with the underlying pathophysiology of advanced or untreated HIV. Please see the following for explanation:

- **Flat, purple-colored rash on the back and chest**
The non-painful, non-pruritic purple rash is highly suggestive of Kaposi sarcoma (KS), an AIDS-defining malignancy caused by human herpesvirus-8 (HHV-8). Kaposi sarcoma develops due to severe immune suppression, allowing unchecked viral-induced angiogenesis and tumor formation. This manifestation is strongly associated with low CD4 counts (NIH, 2023). While skin spots often resemble bruises and don't hurt, internal KS or severe localized swelling can lead to significant discomfort, pain, and trouble with everyday functions like eating or walking.
- **White coating on the tongue**
The white coating on Wilbur’s tongue is consistent with oral