AIDS AND PERIODONTIUM

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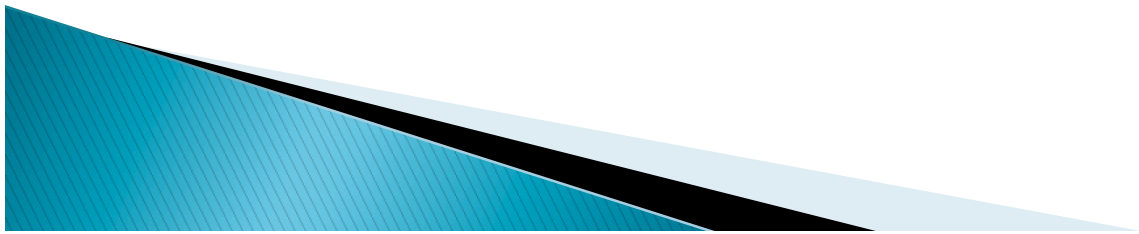
INTRODUCTION

- AIDS is a universal epidemic that significantly affects dental practice, regardless of geographic location.
- The oral cavity is a frequent site for clinical manifestations of the disease.
- The ability to recognize and manage the oral manifestations of this disease is an important part of dental practice.

- ***AIDS is characterized by profound impairment of the immune system due to HIV infection and consists of microbial diseases acquired or reactivated as a result of the immunosuppression.***



CLINICAL DEFINITION OF AIDS

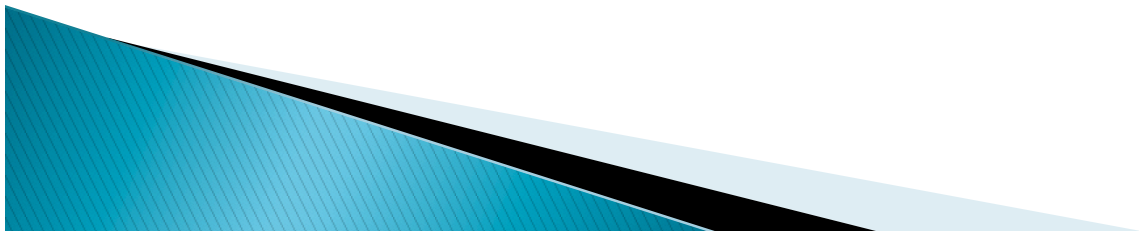
AIDS is defined as a severe immunodeficiency disease arising from infection with HIV, accompanied by some of the following symptoms:

- Life threatening opportunistic infections
- Persistent fever
- Unusual cancers
- Chronically swollen lymph nodes
- Weight loss and diarrhea
- Neurological disorders.

ORIGIN OF AIDS

- The first well-documented case of AIDS occurred in an African man in 1959.
- Samples of his blood yielded genetic material from an early version of HIV.

- It is theorized that it must have first appeared in the early 1950s, after having jumped from original simian hosts. It probably remained in small isolated villages, causing sporadic cases and mutating into more virulent strains that were readily transmitted from human to human.



HISTORICAL BACKGROUND

- AIDS was first recognized in 1981 in USA.
- Luc Montagnier and colleagues from Pasteur's institute in Paris isolated the causative virus, HIV from blood lymphocytes in 1983.
- It was recognized to be a Lentivirus subgroup of the family retroviridae and was called Lymphadenopathy Associated Virus (LAV).
- In 1984 Robert Gallo and colleagues reported isolation of retrovirus from AIDS patients and called it ***Human Tcell Lymphotropic Virus –III (HTLV–III).***
- Other isolates were called as ***AIDS related virus.***

- The International Committee on virus nomenclature in 1986, decided on the generic name ***Human Immunodeficiency Virus (HIV).***

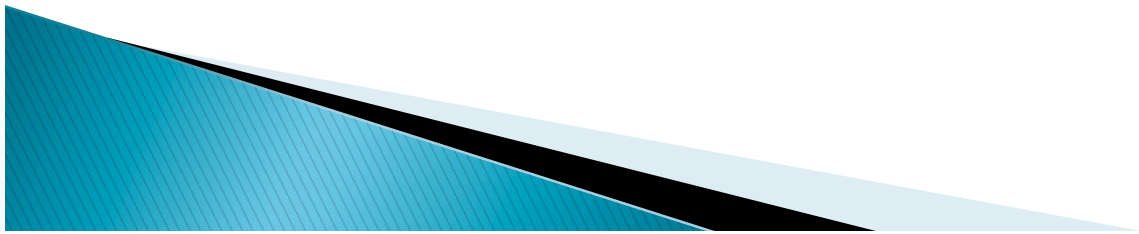
STRUCTURE OF HIV

- ***HIV is a spherical enveloped virus about 90-120nm in size.***
- The nucleo capsid has an outer icosahedral shell and an inner cone shaped core, enclosing the ribonucleoproteins. The genome is diploid, composed of two identical single stranded, positive RNA copies.
- In association with viral RNA is the reverse transcriptase enzyme.
- This has a lipoprotein envelope, the glycoproteins being virus coded.

RESISTANCE

- HIV is thermolabile, inactivated in 10 minutes at 0 degrees and in seconds at 100 degrees.

- At room temperature in dried blood it may survive for 7 days. It is inactivated at extremes of PH.



MODES OF TRANSMISSION

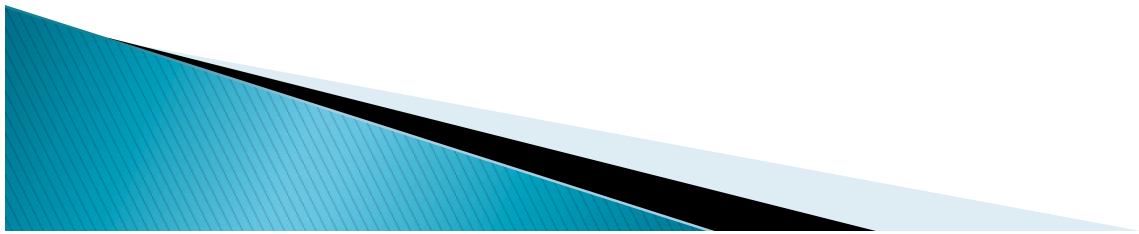
Sexual intercourse

Blood and blood products
Transfusions

Blood exposure through needles.
Tissue and organ transplantation.

Mother to baby

- Transplacental
- At or after birth
- Breast milk.



DIAGNOSIS

- ***Virus isolation***: From T cells in blood and other specimens.

- ***Serological tests***:
  Depend upon the demonstration of specific antibodies.

- ELISA

- WESTERN BLOT
  HIV infection can be checked by measuring the virus on the blood using either:
  1. A p24 antigen test
  2. A viral load assay

Classification of the Most Common Oral Manifestations of AIDS

I. BACTERIAL INFECTIONS

Gingivo-Periodontal Disease

- Linear gingival erythema (LGE)
- Necrotizing ulcerative periodontitis (NUP)
- Necrotizing stomatitis (NS)
- Other Locations

II. FUNGAL INFECTIONS

- Candidiasis
  - Pseudomembranous
  - Hyperplastic
  - Erythematous
- Angular cheilitis
- Other Fungi

III. VIRAL INFECTIONS

- Epstein-Barr Virus
- Oral Hairy Leukoplakia
- Herpes Simplex Virus
- Primary herpetic gingivo-stomatitis
- Recurrent herpetic infection
- Variacella-Zoster Virus
- Herpes zoster
- Human Papilloma Virus
- Condyloma accuminatum
- Multifocal epithelial hyperplasia
- Cytomegalovirus

IV. NEOPLASMS

- Kaposi's sarcoma
- Lymphoma
- Other neoplasms

V. OTHER ORAL LESIONS

- Oral ulcers
- Salivary gland enlargement

STAGES OF HIV INFECTION

1. ACUTE HIV SYNDROME

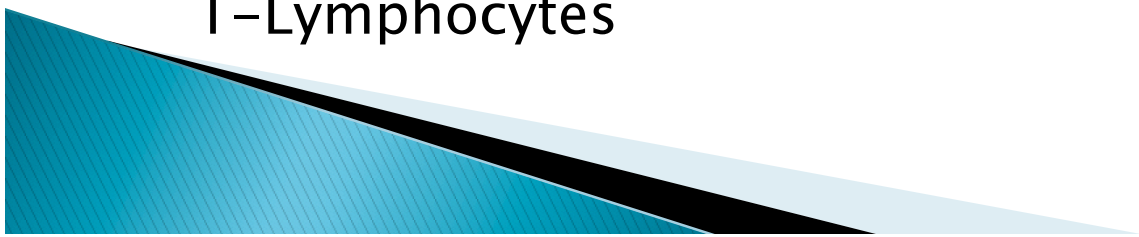
- First stage is of sero conversion
- Virus rapidly spreads to organs, especially the lymphoid tissues
- HIV virus not very aggressive in causing disease or severe symptoms

2. ASYMPTOMATIC STATE

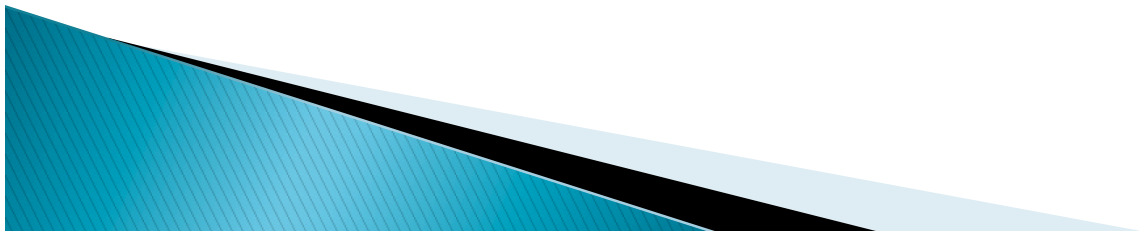
- Infection is latent
- Virus starts to grow and multiply in the lymph nodes

3. SYMPTOMATIC DISEASE/AIDS

- Viremia (spread of virus in the blood)
- Loss of immune system, mainly due to infection of CD4+ T-Lymphocytes

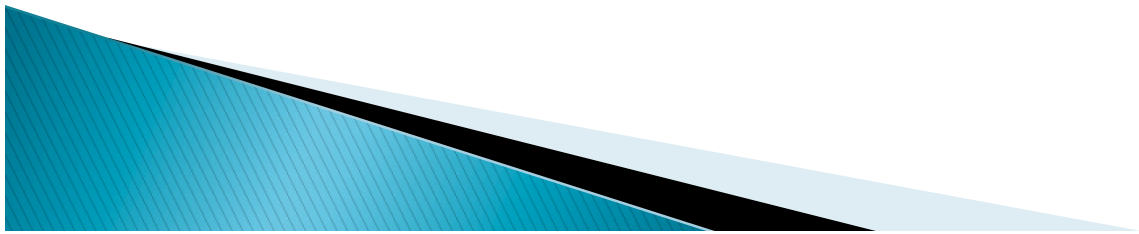


4. END STAGE DISEASE (FULL BLOWN AIDS)
   - Immune system collapses
   - Virus continues to slowly destroy the Immune System for up to 10 years
- Usually an opportunistic infection is the cause of death



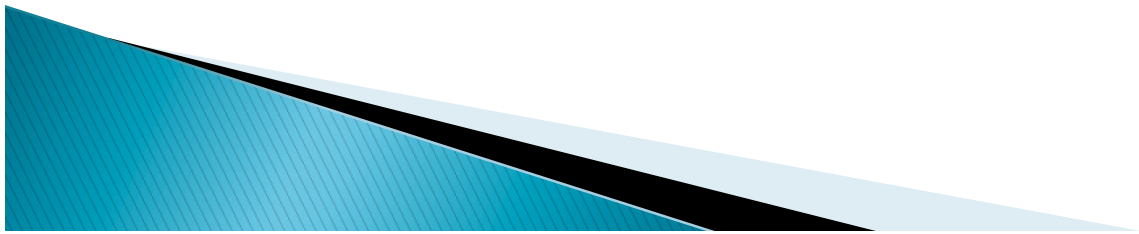
PERIODONTAL TREATMENT PROTOCOL

1. HEALTH STATUS
2. INFECTION CONTROL MEASURES
3. GOALS OF THERAPY
4. SUPPORTIVE PERIODONTAL THERAPY
5. PSYCHOLOGIC FACTORS



I. HEALTH STATUS

- Should be determined from the health history, physical evaluation and consultation with the patient's physician.
- Treatment decisions will vary depending on the patient's state of health
- Information should be obtained regarding
  - CD4+ T4 lymphocyte level
  - Current viral load
  - Difference from previous counts and load
  - H/o of drug abuse, multiple infections
  - Present medications



2.INFECTION CONTROL MEASURES:

- Control measures should be based on American Dental Association (ADA) and the Center for Disease Control and Prevention (CDC) or the Organization for Safety and Asepsis Procedure (OSAP).
- A number of pathogenic microorganisms may be transmitted in the dental setting and these include:

  Airborne pathogens such as tuberculosis

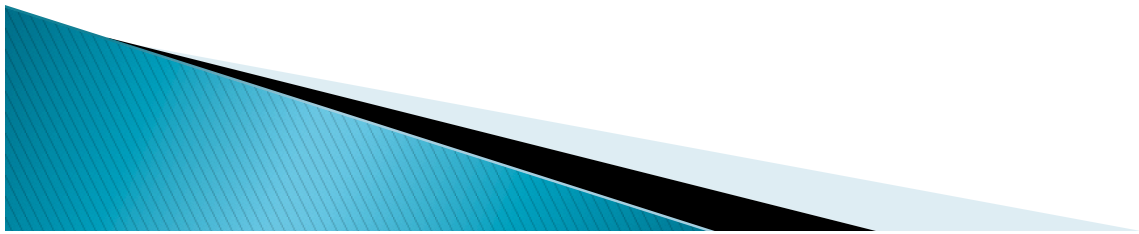
  Bloodborne pathogens such as HIV, HBV, HCV

  Waterborne pathogens such as Legionella and Pseudomonas species

  Mucosal/ skin borne pathogens such as VZV or HSV

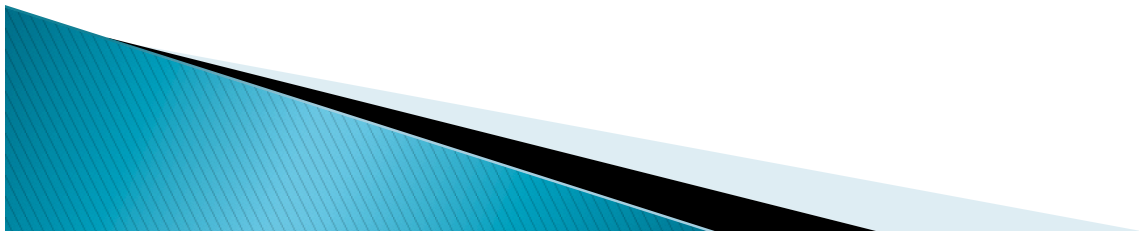
3. GOALS OF THERAPY:

- Primary goals should be restoration and maintenance of oral health, comfort and function.
- Treatment should be directed toward control of HIV-associated mucosal diseases such as chronic candidiasis and recurrent oral ulcerations.
- Effective oral hygiene maintenance is mandatory.
- Conservative, nonsurgical periodontal therapy should be a treatment option for virtually all HIV +ve patients. NUP & NUS can be severely destructive to periodontal structures and should be treated appropriately.



4. SUPPORTIVE PERIODONTAL THERAPY:

- Patient should be encouraged to maintain meticulous personal oral hygiene.
- Recall visits should be conducted at short intervals (2 to 3 months)
- Systemic antibiotic therapy should be administered with caution.
- Blood and other medical laboratory tests may be required to monitor the patients overall health status and consultation and co-ordination with the patient's physician are necessary.



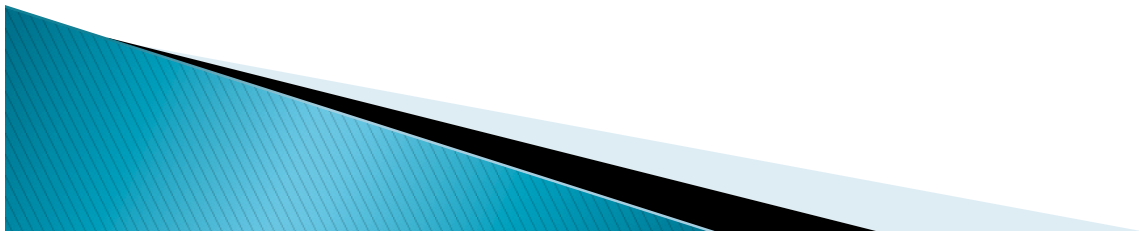
5. PSYCHOLOGIC FACTORS

- HIV infection of neuronal cells may affect brain function and lead to outright dementia.
- Treatment should be provided in a calm, relaxed atmosphere, and stress to the patient must be minimized.
- Early diagnosis and treatment of HIV infection can have a profound effect on the patient's life expectancy & quality of life.
- In case of suspected cases, testing for HIV antibody should be advised after patient counseling and information.

MANAGEMENT OF ORAL AND PERIODONTAL LESIONS ASSOCIATED WITH AIDS

GENERAL PRECAUTIONS TO BE TAKEN

1. Gloves should be worn when touching blood, saliva or mucous membranes.
2. Surgical masks and protective eyewear should be worn.
3. Disposable or washable gowns should be used.
4. Instruments should be sterilized by autoclaving.
5. Debris should be removed by scrubbing with soap and water before sterilization.
6. Surfaces should be decontaminated with sodium hypochlorite.
7. Needles should be disposed with safety guard.
8. Droplets and aerosol production should be avoided where possible by use of rubber dam and high-speed evacuation.



HIV RELATED PERIODONTAL DISEASES

- The first report linking periodontal disease and HIV infection was published in 1985 (Dennison et al).

  Classification on HIV related periodontal diseases(1993):

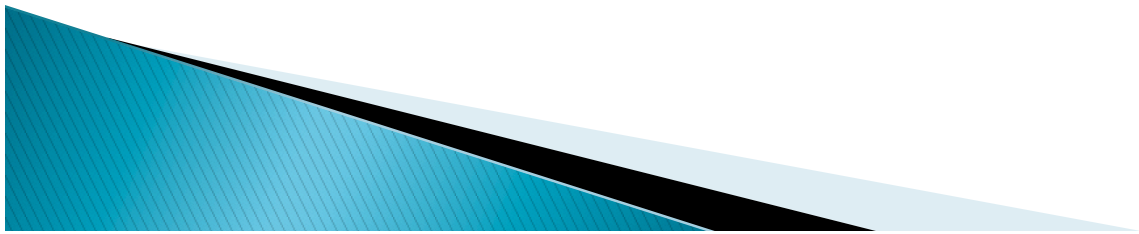
- ***Linear gingival erythema.***
- ***Necrotizing ulcerative gingivitis.***
- ***Necrotizing ulcerative periodontitis***
- ***Necrotizing ulcerative stomatitis***

LINEAR GINGIVAL ERYTHEMA

- Characterized by a marginal band of intense erythema with more apical focal and/or diffuse areas of erythema that may extend beyond the mucogingival line and is associated with earlier stages of HIV infection and CD4+ suppression.
- No ulceration, pocketing or attachment loss and strongly resistant to local treatment
- The lesion may be localised or generalized in nature.

MANAGEMENT OF LGE

- LGE is often refractory to treatment but lesions may undergo spontaneous remission.
- The success of treatment relies on identifying the important causative factors like plaque, tobacco or substance usage, association with candidal infection or presence of a number of periopathogenic bacteria consistent with those seen in conventional periodontitis.



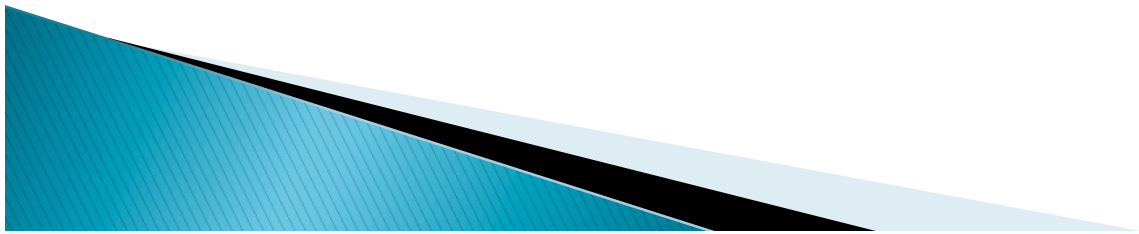
Step I: Instruct the patient in performance of meticulous oral hygiene

Step II: Scale and polish affected areas, and perform subgingival irrigation with chlorhexidine.

Step III: Prescribe chlorhexidine gluconate mouthrinse for 2 weeks

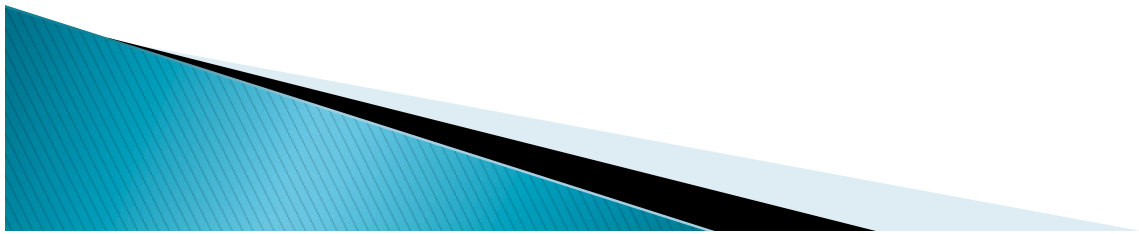
Step IV: Reevaluate in 2-3 weeks. If lesions persist evaluate for possible candidiasis. Consider empiric administration of a systemic antifungal agent such as fluconazole for 7-10 days

Step V: Re-treat if necessary and place the patient on 2-3 month recall.



NECROTIZING ULCERATIVE GINGIVITIS

- NUG has been associated with HIV infection.
- NUG is characteristic of red and swollen gingiva with yellowish-grey marginal areas of necrosis leading to destruction of inter-dental papillae usually takes a chronic or sub acute course.
- Spontaneous hemorrhage and characteristic fetor accompanied by severe pain.
- NUG rapidly progresses and becomes NUP.



NECROTIZING ULCERATIVE PERIODONTITIS

- NUP is necrotizing, ulcerative, rapidly progressive form of periodontitis which occurs in HIV – Positive individuals
- NUP may represent an extension of NUG in which bone loss and periodontal attachment loss occurs.
- NUP is characterized by soft tissue necrosis, rapid periodontal destruction and interproximal bone loss.
- Bone is often exposed resulting in necrosis and subsequent sequestration.
- On treatment, patients undergo spontaneous resolution of the necrotizing lesions, leaving painless, deep interproximal craters that are difficult to clean and may lead to conventional periodontitis (Glick et al, 2000).

MANAGEMENT

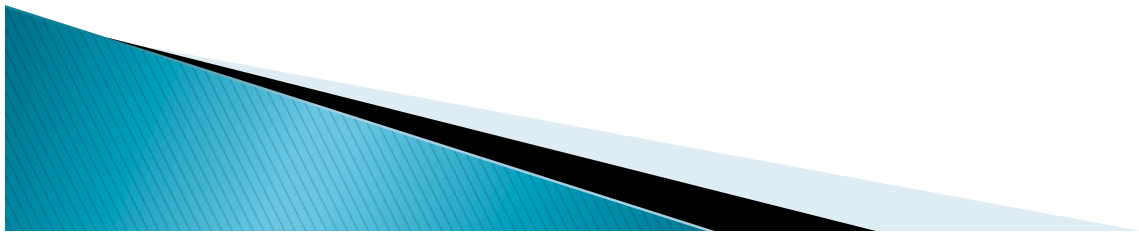
1. Gradual, gentle, local debridement of affected area.
2. Scaling and root planing with oral hygiene instruction
3. In office irrigation with an effective antimicrobial agent such as chlorhexidine gluconate or povidine iodine.
4. Chlorhexidine gluconate 0.12% - 0. 2% mouth rinse twice daily.
5. Metronidazole, 500 mg loading dose and 250 mg four times daily until ulcers heal, alternatively penicillin or tetracycline.
6. Prophylactic topical or systemic antifungal agent and follow-up visit within next 3 days.

NECROTISING ULCERATIVE STOMATITIS

- NUS maybe severely destructive and acutely painful.
- It is characterized by necrosis of significant areas of oral soft tissue and underlying bone.
- It may occur separately or as an extension of NUP and is commonly associated with severe depression of CD4+ immune cells and an increased viral load (GRASSI et al 1988)
- The condition appears to be identical to cancrum oris (NOMA), a rare destructive process occasionally reported in nutritionally deprived individuals.

Treatment

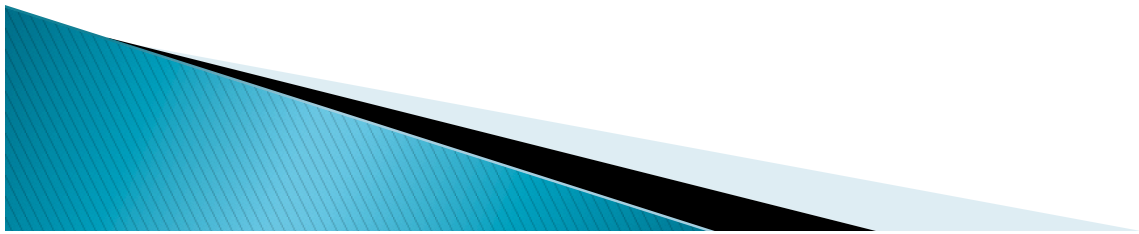
1. Prescription of an antibiotic such as Metronidazole and use of an antimicrobial mouthrinse such as Chlorhexidine gluconate.
2. If osseous necrosis is present, it is often necessary to remove the affected bone to promote wound healing (Winkler et al, 1989).



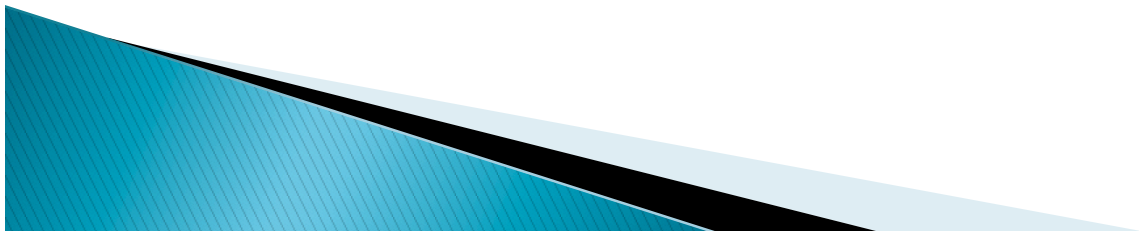
ANTIRETROVIRAL THERAPY IN ADULTS

The primary goals of antiretroviral therapy are:

- To prolong life expectancy.
- To improve quality of life.
- To prevent development of opportunistic infections and other AIDS-related conditions.
- To encourage immune reconstitution.
- To suppress viral replication as far as possible and for as long as possible.
- To prevent transmission of the virus.



- Drugs currently available attempt to block viral replication by inhibiting two viral enzymes – either HIV reverse transcriptase or the HIV protease.
- Other drugs such as fusion Inhibitors and HIV integrase inhibitors are under investigation.

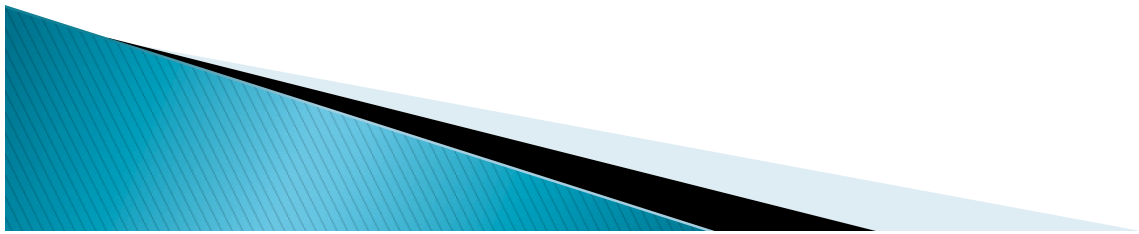


REVERSE TRANSCRIPTASE INHIBITORS

1 Nucleoside reverse transcriptase inhibitors (NRTIs)

2. Non-nucleoside reverse transcriptase inhibitors (NNRTIs)

- These drugs forestall genetic integration of the virus.
- NRTIs resemble the natural nucleotide building blocks of DNA so that when the reverse transcriptase tries to add the drug to a developing strand of DNA, it cannot be completed.
- NNRTIs inhibit activity of the reverse transcriptase directly.

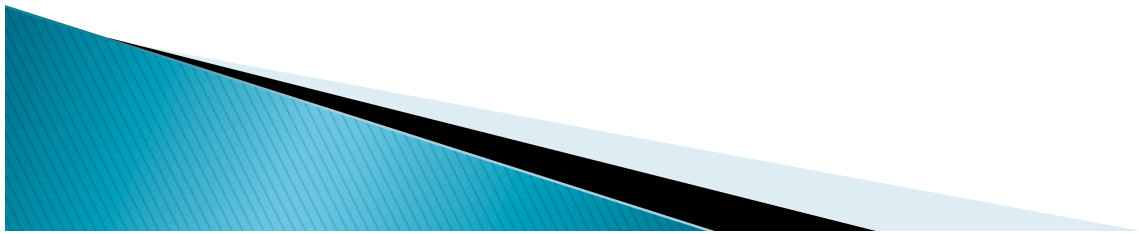


Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

- ***Zidovudine*** 250mg – 300mg bd or 200mg tds.
- ***Stavudine*** 40mg bd (30mg bd if weight < 60kg).
- ***Lamivudine*** 150mg bd.
- ***Didanosine*** 200mg bd (125mg bd if weight <60kg).
- ***Zalcitabine*** 1.125mg bd
- ***Abacavir*** 300mg bd.

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

- ***Nevirapine***
- Dose: One 200mg tablet daily for two weeks, then 200mg bd.
- ***Efavirenz***
- Dose: 600mg once daily.



PROTEASE INHIBITORS

- Protease inhibitors act at a later stage and interfere with a viral enzyme, HIV protease, which cleaves viral polyproteins into functional end products. This prevents the formation of mature infectious virus and results in the release of immature non-infectious viral particles.

PROTEASE INHIBITORS (PIs)

- ***Indinavir***
- ***Ritonavir***
- ***Saquinavir***
- ***Nelfinavir***
- ***Lopinavir / ritonavir***

ADVERSE DRUG EFFECTS:

- Zidovudine and ganciclovir may induce leukopenia, resulting in oral ulcers.
- Xerostomia and altered taste sensation may be seen with diethyl dithiocarbamate (Dithiocarb).
- Drug induced mucositis and lichenoid drug reactions are common in HIV +ve patients.
- Protease-inhibiting drugs can cause adverse reactions including nausea, development of kidney stones, lypodystrophy, an increase in abdominal fat mass, and development of the classic “buffalo hump” usually associated with administration of systemic corticosteroid
- The dentist should remain alert for general signs and symptoms of adverse drug effects, some of which can affect oral tissues.

CONCLUSION

- The median period between initial HIV infection and outright AIDS is approximately 12 years and the life expectancy of persons living with AIDS has been significantly prolonged with current anti-retroviral drug therapy.
- This indicates that HIV-infected patients are potential candidates for conventional periodontal treatment and treatment decisions should be based on overall health status of the patient, the degree of periodontal involvement and the motivation and ability of the patient to perform effective oral hygiene procedures.
- By combining local and systemic therapy with new antiviral drugs, dental and medical practitioners may together help to reduce morbidity in HIV-infected patients.