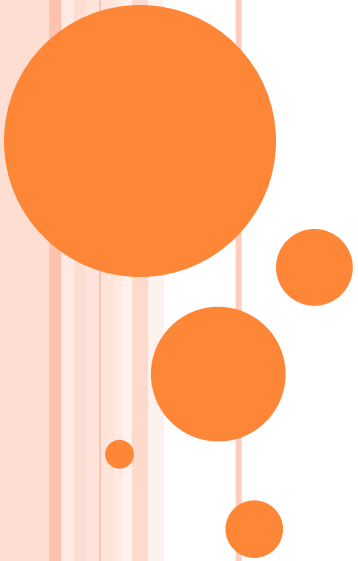
MANAGEMENT OF PATIENTS WITH IMMUNOLOGIC DISORDERS

By: Asmare Getie (Assistant professor in AHN)



LEARNING OBJECTIVES

- At the end of this topic the students should be able to:
- ✓ Define immunity
- ✓ Describe types of immunity
- ✓ list different diseases that can be caused by immunologic disorders.

INTRODUCTION

- The physiologic function of the immune system is to **protect individuals from *infectious pathogens,***
- The normal immune system has **three key properties:**

INTRODUCTION…

1. A highly diverse pieces of **antigen *receptors*** that ***enables recognition of infinite range of pathogens***.

2. Immune ***memory***, to mount ***rapid recall immune responses***.

3. Immunologic **tolerance**, to avoid immune damage to normal self-tissues.

INTRO….

- Although immune system is ***vital to survival***, it will affect our body ***negatively***.
- The immune system is similar to the *two-edged weapon.*

❖ ***Immunodeficiency*** states render human ***beings to infections***.

INTRODUCTION…

- A ***hyperactive*** immune system may ***cause fatal disease***.
- The immune system may ***lose its normal capacity*** **to** ***distinguish self from non-self*****,** resulting in ***immune reactions*** against one's own tissues and cells (***autoimmunity***).

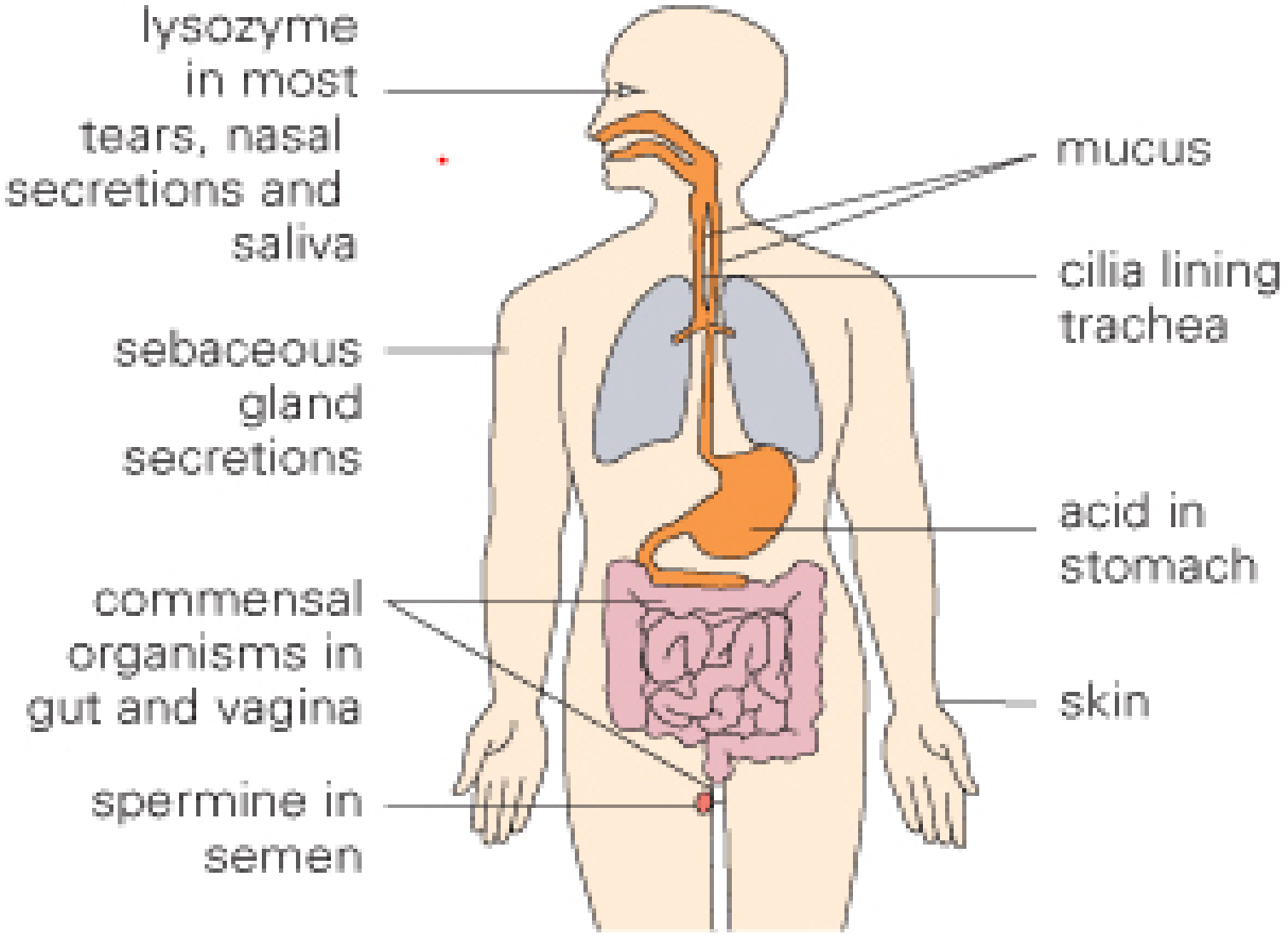
INNATE AND ADAPTIVE IMMUNITY

- ***Innate immunity*** (also called natural, or native immunity) refers,
- ✓ Defence mechanisms that are present **even** ***before infection*** and have evolved to ***specifically recognize microbes*** and protect ***multicellular*** organisms against infections.

CON…..

- It is nonspecific.
- Innate immunity is the ***first line of defence***, because it is ***always ready to prevent*** and ***eradicate*** infections.

biochemical	chemical and physical



INNATE…..

- Before an infectious agent can penetrate the body, it must ***pass barriers*** that operate at the body surfaces.
- One of these is the ***skin***, which is normally ***impermeable*** to the majority of infectious agents.

INNATE…

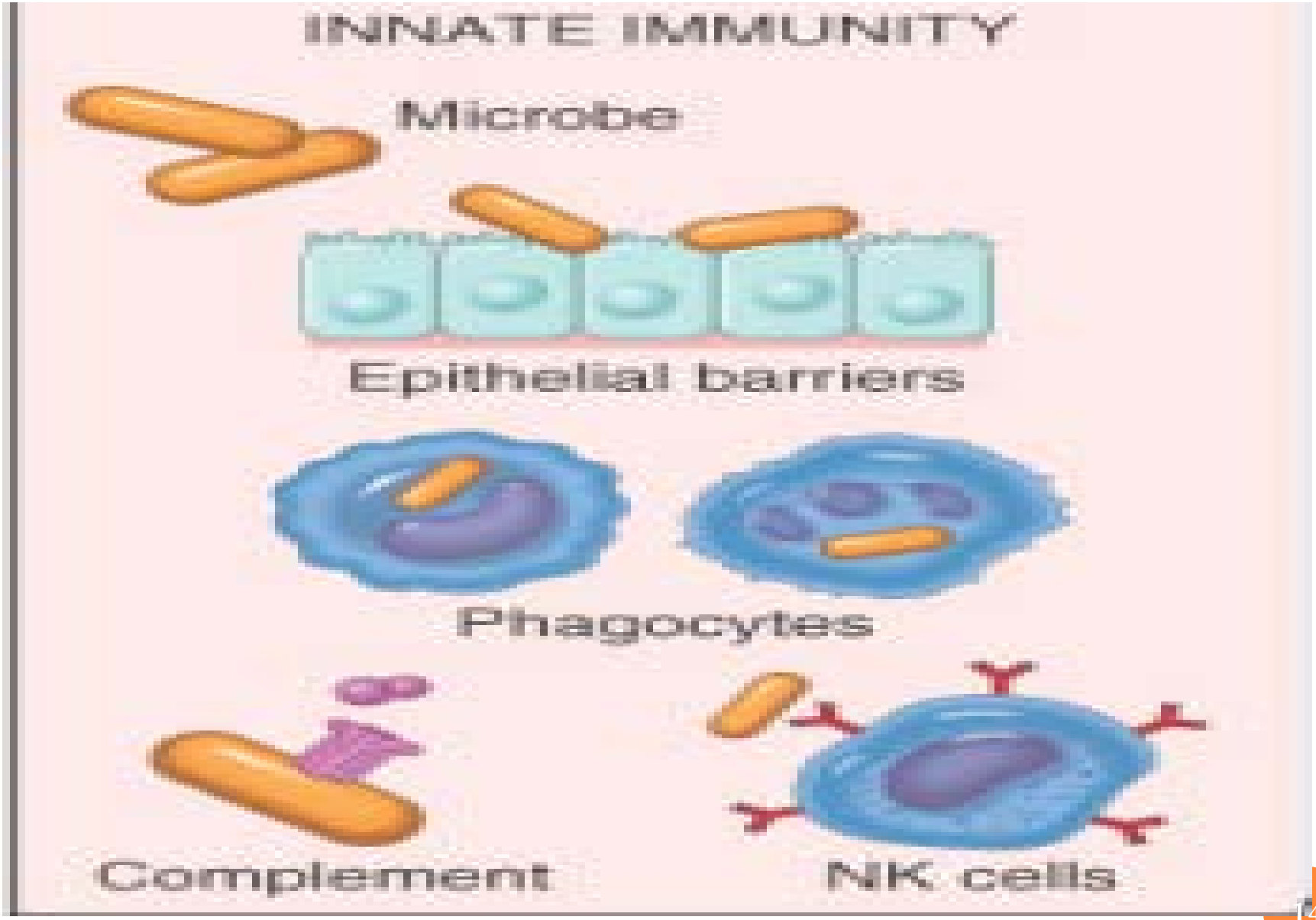
- Many bacteria ***fail to survive for long*** on the ***skin*** because of the direct inhibitory effects of ***lactic acid*** and ***fatty acids*** present in sweat and sebaceous secretions and the lower ***PH***.

INNATE….

- The major components of innate immunity are:
  - **Epithelial barriers** that block entry of environmental microbes,
  - **Phagocytic cells** (mainly neutrophils and macrophages),

INNATE…

- *Natural killer* (NK) cells,
- And several *plasma proteins*, including the proteins of the complement system.


INNATE IMMUNITY
Microbe
Epithelial barriers
Phagocytes
Complement
NK cells

Adaptive Immunity

- Adaptive immunity is characterized by ***antigen-specific responses*** *to a foreign antigen or pathogen.*
- It develops ***later after exposure* to microbes**.
- More ***powerful*** in combating infections.
- Adaptive immunity can be ***passive*** or ***active***

Passive Immunity

- Transmitted by antibodies or lymphocytes preformed in ***another host.***
- The main advantage is the **prompt availability** of **large amounts of antibody**.
- Disadvantages are the ***short life span*** of these antibodies and possible *hypersensitivity reactions*.

Active Immunity

- It is ***induced after contact with foreign antigens***.

- Advantages include:

- ✓ ***Long-term resistance*** (based on memory of prior contact with antigen and,

ACTIVE …

- The capacity to **respond faster** and to a ***greater extent*** on subsequent contact with the same antigen.

CON…

- The adaptive immune system consists of **lymphocytes** *and their products*, including **antibodies**.
- The adaptive response can be *antibody-mediated* (humoral), *cell-mediated* (cellular), or both.

ADAPTIVE…

- **Cell-mediated** is responsible for defence against **intracellular microbes**, where as
- **Humoral immunity**, protects against **extracellular microbes** and their ***toxins***.

ADAP.....

- Cellular immunity is mediated by *T (thymus-derived) lymphocytes*.
- Humoral immunity is mediated by *B (bone marrow-derived) lymphocytes* and their secreted products, antibodies.

Disorders of the Immune System

- **Hypersensitivity** reactions, which give rise to ***immunologic injury***.
- **Autoimmune** diseases, which is caused by immune reactions against self.
- **Immunologic deficiency syndromes**, result from **genetically determined** or ***acquired defects*** in some components of the normal immune system.

Hypersensitivity reactions

- Contact with antigen leads not only to induction of a protective immune response, But it ***also triggers serious reactions*** that can be ***damaging to tissues***

HYPERSENSITIVITY…

- Exogenous antigens occur in dust, pollens, foods, drugs, microbiologic agents, chemicals, and many blood products used in clinical practice

HYPERSENSITIVITY…..

- The immune responses that result from such exogenous antigens take a variety of forms,

✓ *Itching of the skin*

✓ *Bronchial asthma.*

✓ *Anaphylaxis reaction*

Allergic Rhinitis

- Allergic rhinitis, or allergic rhino sinusitis, is one type of hypersensitivity disorder.
- Allergic rhinitis is associated with a symptom complex characterized by:

Allergic…

- ✓ Paroxysms of sneezing,
- ✓ Rhinorrhea,
- ✓ Nasal obstruction, and itching of the eyes, nose, and palate.

Risk factors

- Family history of atopy
- Birth during the pollen season
- Early use of antibiotics
- Maternal smoking exposure in the first year of life
- Exposure to indoor allergens, such as dust mite allergen.

PATHOPHYSIOLOGY

- Upon exposure to an allergen, atopic individuals respond by producing allergen-specific ***IgE***.
- These IgE antibodies bind to IgE receptors on ***mast cells*** in the ***respiratory mucosa*** and to ***basophils*** in the peripheral blood.

PATHO….

- When the same allergen is subsequently inhaled, the IgE antibodies activate the cell.
- Mast cells in the nasal tissues release preformed chemical mediators, which cause the symptoms of ***allergic rhinitis***.

Clinical manifestations

- Sneezing
- Rhinorrhea
- Nasal obstruction
- Nasal itching
- Postnasal drip
- Cough
- Irritability

Diagnosis

- The diagnosis of allergic rhinitis can be made on clinical grounds.

Rx

- Management aims to relieve symptoms of nasal obstruction and rhinorrhea.
- treatment includes:
- ✓ Analgesics (NSAIDs, Acetaminophen).

NURSING INTERVENTION

- Administer **antihistamines**, **decongestants** and ***corticosteroids***.
- Teach the client the proper use of ***saline nasal sprays*** by blowing his nose first then administer the nasal medication.

NURSING…

- Encourage a routine cleaning of the house, furnitures and equipments which may cause house dust and other pollens.

ANAPHYLAXIS

- It is an ***acute***, potentially lethal, ***multisystem syndrome*** resulting from;
- The *sudden release* of ***mast cell-*** and ***basophil-derived mediators*** into the circulation.

Anaphylaxis

- It most often results from immunologic reactions to ***foods***, ***medications***, and ***insect*** stings

SYMPTOMS AND SIGNS

- **Skin** symptoms and signs,
  - ✓ Generalized ***urticaria***, itching or flushing, swollen lips-tongue-uvula, periorbital edema, conjunctival swelling.
- **Respiratory** symptoms and signs,

Symptoms and signs

- Nasal discharge, nasal congestion, change in voice quality, sensation of throat closure or *choking*, *stridor*, *shortness of breath*, *wheeze*, *cough*

CON…

- **Gastrointestinal** symptoms and signs,
  - ✓ Nausea, vomiting, diarrhea, and crampy abdominal pain.
- **Cardiovascular** symptoms and signs,
  - ✓ Hypotonia (collapse), syncope, incontinence, dizziness, tachycardia, and hypotension.

CON…

- Death from anaphylaxis usually results from **asphyxiation** *due to upper airway edema or* ***respiratory failure*** *due to* **bronchial obstruction.**
- And less commonly, from cardiovascular collapse.

Diagnosis

- There are **three** diagnostic criteria, each reflecting a different clinical presentation of anaphylaxis.

Dx....

Criterion 1

- Acute onset of an illness (minutes to several hours) involving the skin, mucosal tissue,) and at least one of the following;
- **Respiratory** compromise (eg, dyspnea, wheeze-broncho-spasm, stridor, hypoxemia).

Criteria 1…

- **Reduced blood pressure** (BP) or associated symptoms and signs of end-organ dysfunction (eg, hypotonia [collapse] syncope, incontinence).

Dx....

- **Criterion** 2 Two or more of the following
  - Involvement of the skin-mucosal.
  - Respiratory compromise
  - Reduced BP
  - Persistent gastrointestinal symptoms and signs (eg, crampy abdominal pain, vomiting).

Dx....

- **Criterion** 3

- ✓ Reduced BP ***after exposure to a known allergen*** for that patient (minutes to several hours):
- ✓ Reduced BP in adults is defined as a systolic BP **<90** mmHg or **>30** % decrease from that person's baseline.

Rx (medical management)

- **Immediate management**
  - Give epinephrine 0.3 to 0.5 mg IM.
  - Can repeat every 5 to 15 minutes as needed.
  - If symptoms are not responding to epinephrine injections, prepare IV epinephrine for infusion.

Rx....

- Place patient in recumbent position , if tolerated, and elevate lower extremities.
- **Oxygen**: Give 6 to 8L/m via face mask.
- **Normal** saline rapid bolus: Treat hypotension with rapid infusion of 1 to 2L IV.

NURSING INTERVENTION

- Provide *supplemental oxygen* and observe.
- Insert an I.V. line for giving emergency drugs and volume expanders.
- Continually reassure the patient and explain all tests and treatments to reduce fear and anxiety.

NURSING…

- Continuously assess the patient's response to treatment.
- Monitor *vital signs and* ***cardiopulmonary*** *and* ***neurologic*** function.

IMMUNOLOGIC DEFICIENCY SYNDROMES

- It can be divided into the ***primary*** and ***secondary* immunodeficiency** disorders.
- Primary deficiency are almost always ***genetically determined***.

CON…

- Secondary immunodeficiency states, which arise as complications of
  - ✓ Infections
  - ✓ Malnutrition;
  - ✓ Aging
  - ✓ Side effects of immunosuppressant,
  - ✓ Irradiation, or chemotherapy for cancer and other autoimmune diseases.

Human Immunodeficiency Virus Infection

- Learning Outcomes:

- On completion of this chapter, the learner will be able to:
- ✓ Describe the modes of transmission of human immune deficiency virus (HIV) infection and prevention strategies
- ✓ Explain the pathophysiology associated with the clinical manifestations of HIV and acquired immune deficiency syndrome (AIDS) and the purpose of antiretroviral therapy (ART)

Human Immunodeficiency Virus Infection

- Is a retrovirus that ***attacks the body's immune system*** and causes ***<u>immunosuppression</u>***
- Persons with HIV are more susceptible to infections
- Untreated HIV can lead to AIDS (acquired immunodeficiency syndrome)
- No cure: lifetime
- ***Controlled: with proper medical care***
- ***Those who get effective HIV treatment can live long, healthy lives and protect their partner***

EPIDEMIOLOGY:

- Worldwide:
  - According to the 2020 WHO report;
  - 37.7 million people are living with HIV
  - 2/3 of whom (25.4 million) are in the African Region
  - 680,000 people died from HIV-related causes in 2020
  - 1.5 million people acquired HIV in 2020

  - UNAIDS:"FastTrack: Ending the AIDS epidemic by 2030"
  - Prevent nearly 28 million new HIV infections
  - 21 million AIDS-related deaths.

EPIDEMIOLOGY:

- ***Ethiopia***:
- According to the Ethiopian Demographic and Health Survey 2016 (EDHS 2016):

✓ The national HIV prevalence is- 0.9%

✓ The urban prevalence was- 2.9%

✓ Rural prevalence- 0.4%

✓ According to 2020 UNAIDS forecast;

✓ People living with HIV- 620 000 [500 000 - 760 000]

✓ Newly infected with HIV-12 000 [6100 - 21 000]

✓ Deaths due to AIDS-13 000 [7300 - 21 000]

History of HIV/AIDS

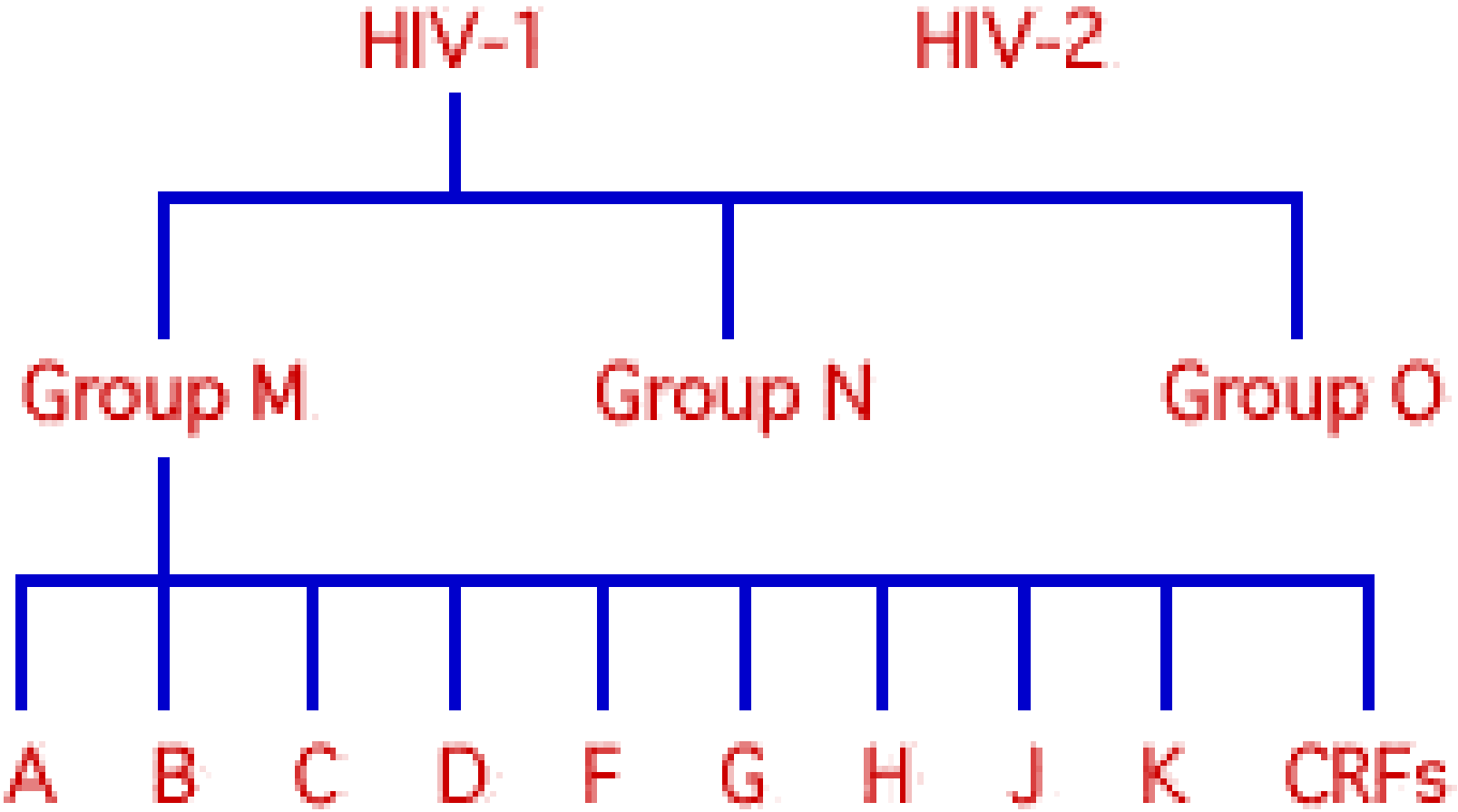
- AIDS was first recognized in the US in1981
- CDC reported the unexplained occurrence of ***PCP*** in five previously healthy homosexual men in Los Angeles and ***Kaposi's sarcoma***.
- The disease was soon recognized in male and female injection drug users.

CON…

- In 1983, human immunodeficiency virus (HIV) was isolated from a patient with ***lymphadenopathy***.
- At this time HIV recognized as a cause of AIDS.

ETIOLOGY

- HIV 2
- HIV 1(commonest)
  - Single stranded RNA
  - Has different diversities/groups
  - HIV is a highly variable virus which ***mutates*** very readily.
  - This means there are many different strains of HIV, even within the body of a single infected person.


HIV-1
HIV-2
Group M
Group N
Group O
A
B
C
D
F
G
H
J
K
CRFs

CON…

- Group O ;restricted to west-central Africa and
- Group N - discovered in 1998 in Cameroon
    - extremely rare.
- More than 90% of HIV-1 infections belong to HIV-1 group **M**.

SUBTYPES…

- Within group **M** there are known to be at least nine genetically distinct **subtypes** (or clades) of HIV-1.
- These are subtypes **A**, B, **C**, **D**, F, G, H, J and K.

TRANSMISSION…

- Sexual Transmission
- The most common mode of HIV transmission
- Forms:anal,vaginal,oral
- Sexual activity involves contact with semen, vaginal secretions, and/or blood
- Increased chance of infection
- ✓ For the partner who receives the semen
- ✓ Sexual activities that cause trauma to local tissues
- ✓ Having sexually transmitted infections (e.g.,herpes, syphilis)

TRANSMISSION…

- Perinatal Transmission
- Transmission from an HIV-infected mother to her infant can occur during:
- Pregnancy, delivery, or breastfeeding
- 25% chance of transmission in untreated cases
- Less than 2% with proper care

PATHOPHYSIOLOGY…

- The HIV life cycle is complex
- ***Attachment and Fusion:***
- HIV enters the CD4 cell by binding to protein receptors (gp-120 and gp-41) on the outside of the cell
- ***Uncoating:*** HIV RNA enters the CD4 cell
- ***Reverse transcription:*** reverse transcriptase enzyme transforms HIV RNA into a single strand of DNA
- *Strand copies itself*, becoming double-stranded viral DNA
- **Translocation**: viral DNA is Imported to cell nucleus
- **Integration: integrase** enzyme integrate viral DNA to host cell DNA
- ***Cellular activation*** causes transcription (copying) of HIV DNA back to RNA
- ***Viral Assembly***: HIV assembled under cell membrane and buddes from cell

PATHOPHYSIOLOGY…

- **Maturation**: protease enzyme involved in the replication process, cleaves the newly formed strands of HIV genetic material into smaller pieces

❖ New HIV virions are then formed and released

❖ CD4 cell is then destroyed after the HIV virions are released

- **HIV destroys about 1 billion CD4** cells every day
  - For many years, the body make new CD4 cells to replace the destroyed cells
  - Over time the ability of HIV to destroy CD4 cells exceeds the body's ability to replace the cell

Tissues where HIV replicates

- Lymph nodes
- Spleen
- Bone marrow
- Brain
- Testis

Life Span of HIV and Infected cells

- ***10^9 - 10^{11}*** viral copies per day
- Average life-span of HIV in plasma is ***30-60*** mins.
- Average life-span of HIV-infected CD4 lymphocytes is ~1.6 days
- *Integrated HIV genome can stay dormant within a cellular DNA for many years*

Day 0

Exposure to HIV at mucosal surface (sex)

Day 0-2

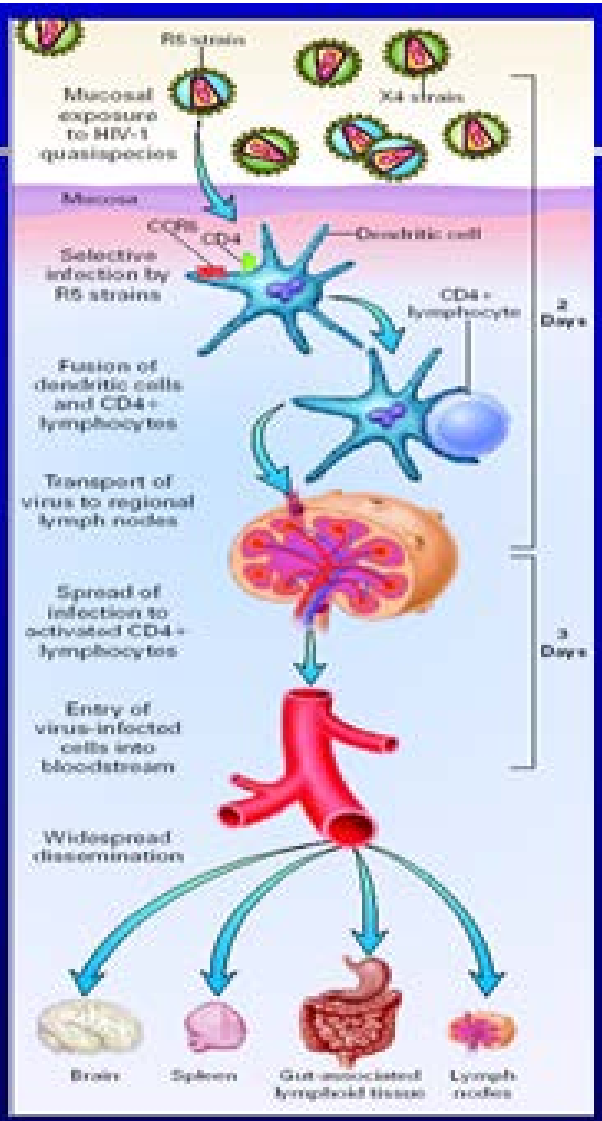
Virus collected by dendritic cells, carried to lymph node

Day 4-11

HIV replicates in CD4 cells, released into blood

Day 11 on

Virus spreads to other organs



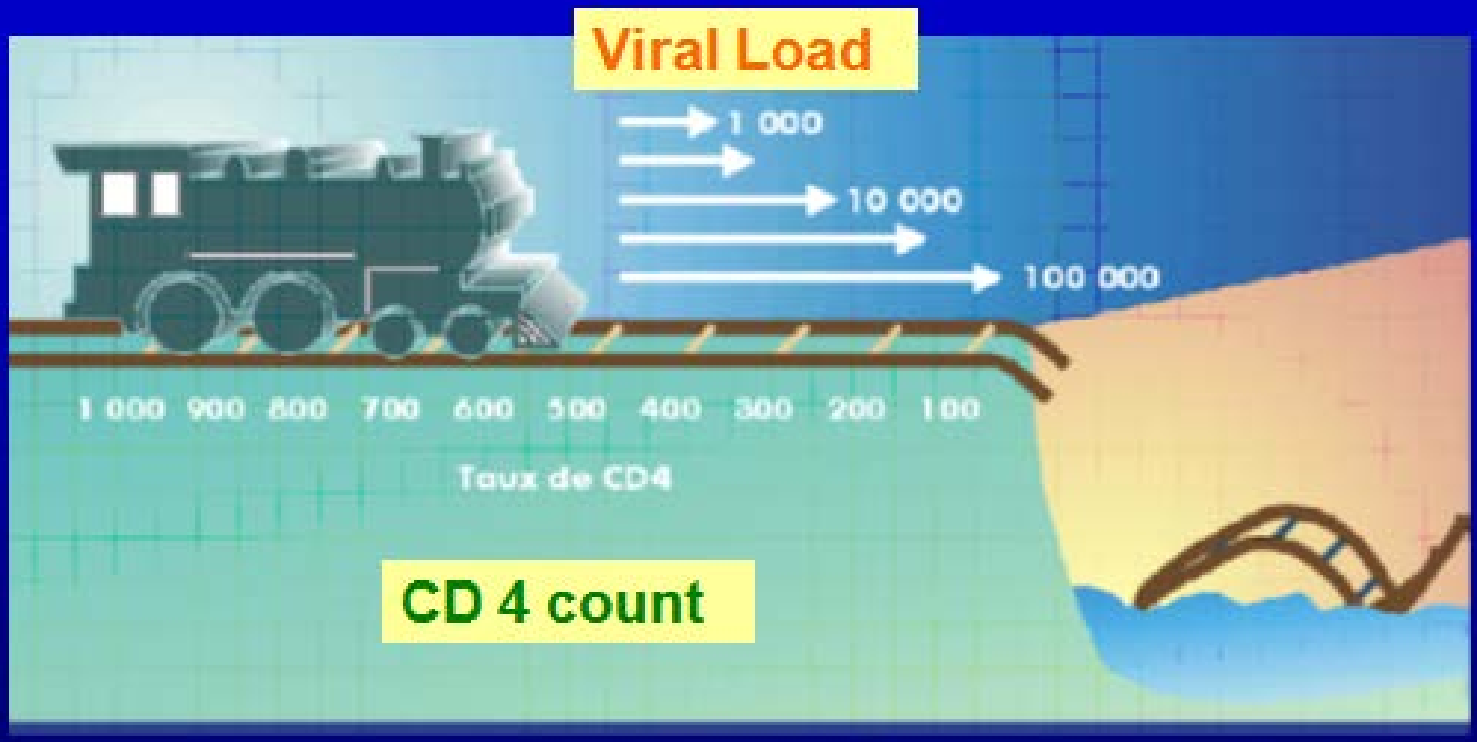
Early events in HIV infection. N Eng J Med; 1998; 339, 33-39

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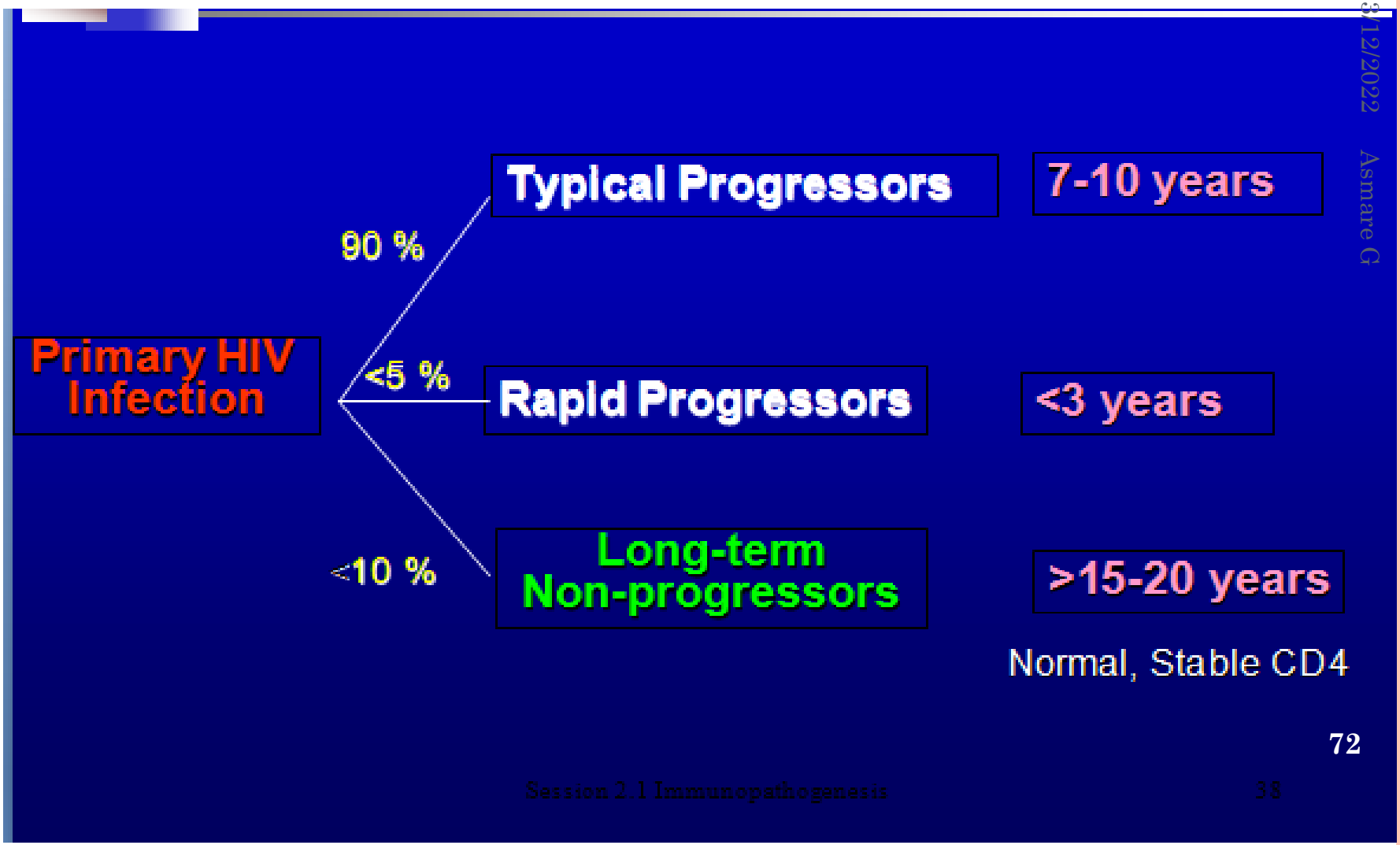
Indicators of Progression of HIV Infection

- **CD4 count** is an indicator of the status of the immune system (distance to the cliff)
- **Viral Load** is an indicator of the amount of virus in the blood (speed of the train)

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Viral Load
1 000
10 000
100 000
1 000 900 800 700 600 500 400 300 200 100
Taux de CD4
CD 4 count

Patterns of HIV Disease Progression



Acute Retroviral clinical Syndrome

- Non-specific '*flu-like*' symptoms, which do not lead directly to the diagnosis of HIV infection and which are not present in all patients.
  - Fever
  - Fatigue

Acute…

- Pharyngitis
- Lymphadenopathy
- Rash

WHO Clinical Staging of HIV Disease

- The WHO clinical staging system includes:
- A **clinical** classification system.
- A **laboratory** classification to categorize the immunosuppression of adults by their *total* lymphocyte counts or CD4.

CON..

- This staging system has proven reliable for predicting morbidity and mortality in infected adults.

  The WHO Clinical Staging System is based on clinical markers believed to have prognostic significance resulting in four categories.

WHO Clinical Staging System

Clinical Stage 1

Asymptomatic infection

Persistent generalized lymphadenopathy (PGL)

Definition of PGL:
swollen or enlarged lymph nodes > 1cm,
in 2 or more non-contiguous extra-inguinal sites,
in absence of known cause; lasting more than 3 month

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Clinical Stage 2

- Unexplained Weight loss <10% of presumed body weight.
- Minor mucocutaneous manifestations:
  - Papular pruritic eruptions
  - Seborrhoeic dermatitis
  - Angular chelitis

CON…

- Fungal nail infections of fingers
- Recurrent oral ulcerations (≥ 2 x/6months)
- Herpes zoster (current or in last 2 years)
- Recurrent upper respiratory tract infections (sinusitis, otitis media, bronchitis, pharyngitis)





Clinical Stage 3

Oral candidiasis

Unexplained Weight loss >10%

Recurrent vaginal candidiasis

Oral hairy leukoplakia

Pulmonary tuberculosis (Current)

Unexplained chronic diarrhoea > 1 month

CON….

Unexplained prolonged fever (intermittent or constant for >1 month)

Severe presumed bacterial infections (e.g. pneumonia, empyema, bone or joint infection, meningitis, bacteremia)

Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis.

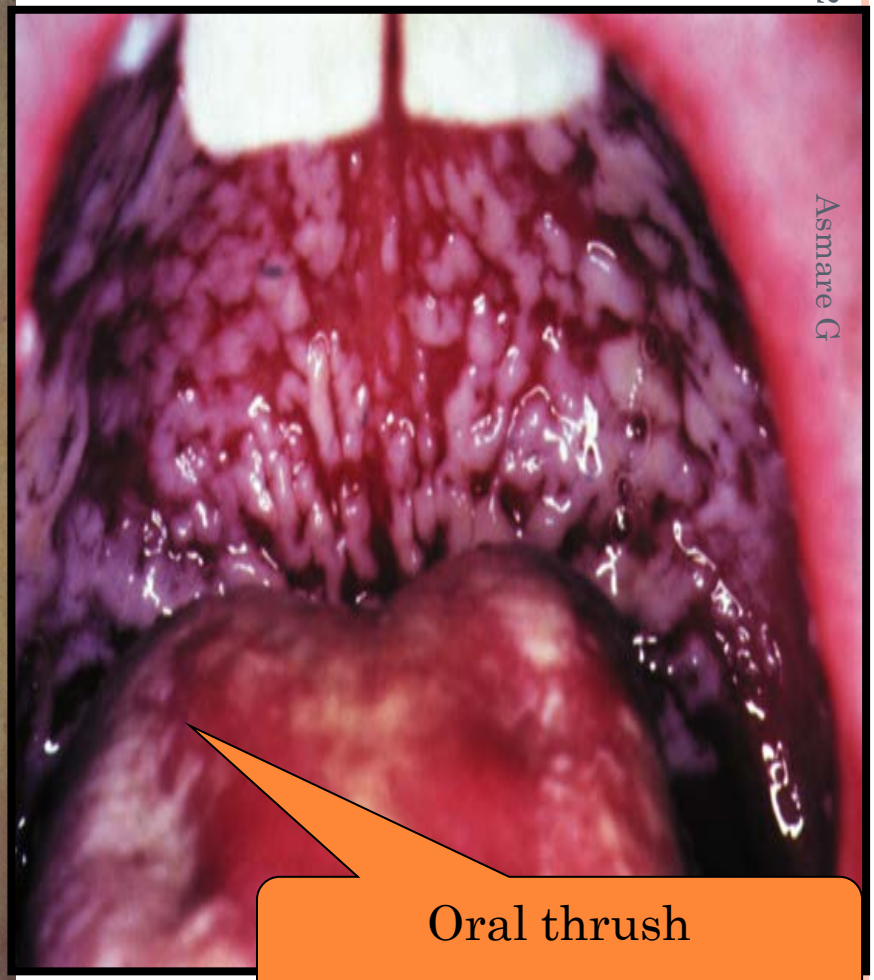
CON…

- **Unexplained**:
  - *Anaemia (<8g/dl) or*
  - *Neutropenia (<500/mm³) or*
  - *Thrombocytopenia (<50 000/mm³)*

For > 1 month

CON…





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Clinical Stage 4

- *Recurrent severe* bacterial pneumonia
- Chronic herpes simplex infection orolabial, genital, or anorectal of > 1 month duration.
- Cytomegalovirus infection (other than liver, spleen, LN)
- CNS toxoplasmosis.

CON…

- ✓ HIV wasting syndrome
- ✓ Pneumocystis pneumonia
- ✓ Candidiasis of the oesophagus
- ✓ Extrapulmonary tuberculosis
- ✓ Kaposi's sarcoma
- ✓ Cryptococcal meningitis (or other extra pulmonary crypto).

CON….

- Invasive cervical carcinoma
- Cryptosporidiosis, Isosporiasis
- HIV encephalopathy
- Progressive multifocal leukoencephalopathy (PML)
- Candidiasis of trachea, bronchi, or lungs
- Any disseminated endemic mycosis Histoplasmosis, Coccidiomycosis, Penicilliosis

HIV WASTING: DEFINITION

Weight loss > 10%

PLUS

nexplained chronic diarrhoea
> 1 month

OR

Unexplained prolonged fever
> 1 month



DIAGNOSIS:

- Diagnostic Studies
  - Made by testing for HIV antibodies and/or antigens
  - HIV screening tests can be done using blood or saliva
  - It takes several weeks after infection before a screening test can detect evidence of HIV
    - This delay is known as the window period
    - The typical window period is about 3 week

DIAGNOSIS…

- **Serologic Tests** :
- **A.HIV antibody tests:**
  - ***ELISA*** :used to be standard screening test for HIV
    - ✓ A very sensitive test (99.5 %),but not very specific
    - ✓ A positive result needs to be confirmed by Western blot for confirmation
  - **Western blot:** is an excellent confirmatory test.
    - ✓ It has high specificity but relatively poor sensitivity
    - ✓ It should not be used for screening purpose

DIAGNOSIS…

- **Rapid HIV antibody testes**
  - Rapid tests have reasonably good sensitivity and specificity (>99 %)
  - Test result can be made available in < 30 minute
    - **HIV antigen assays (Tests)**
- ***P24 antigen capture assay:***
  - Detects p24 viral protein in the blood of HIV infected individuals.
  - Detected during early infection, before seroconversion.
  - Used to detect blood donors during the Window period

Diagnosis…

- **DNA – PCR :Viral replication**
  - Is an extremely sensitive test:
    - ✓ Detect 1-10 copies of HIV DNA/ml of blood
    - ✓ Uses PCR technology to amplify proviral DNA
    - ✓ It is highly sensitive and the chance of false positivity is high
  - It is often used
    - ✓ To make early diagnosis of HIV in infants till the 18 months old
    - ✓ To diagnose or confirm virologic failure
    - ✓ When there is indeterminate serology

DIAGNOSIS…

CD4T cell count :

- An important indicator of the level of immune suppression
- In patients with HIV CD4 count drops by an average of 50 - 100 cells per year
- CD4 count may be variable depending on circumstances
- Inter current infection, use of steroids and stress could affect CD4 count

Importance's of CD4 count

- ✓ To decide eligibility of a patient for ART
- ✓ To follow the progress of a patient on ART
- ✓ To diagnose immunologic failure in patients

DIAGNOSIS…

Additional tests

- **That done is patients with HIV infection include:**
- HBV ,HCV CBC and ESR
- Liver function test: GOT/AST and SGPT/ALT
- Serum Creatinine
- Syphilis serology:
- AFB,chest X-Ray where possible
- Stool examination for parasites
- Malaria blood slide
- Pregnancy test for women in child bearing age

DIAGNOSIS…

- Laboratory Studies in HIV Progression:
- Two laboratory tests are used for monitoring HIV progression:

❖ **CD4cell count and viral load**

- **CD4 cell count: is a marker of immune function**

❖ Disease progress= decreases the number of CD4 cells

❖ Normal range:800 to 1200cells/μL

- Viral load: provide an assessment of disease progression

❖ Lower the viral load= the less active the disease

❖ Reported as real numbers (e.g.,1260 copies/μL)

MANAGEMENT:

- HIV Testing Services

❑ The full range of services that should be provided together with HIV testing including

❖ Counseling (pre-test information and post-test counseling);

❖ Linkage to appropriate HIV prevention, treatment and care services and other clinical services; and

❖ Coordination with laboratory services to support quality assurance and the delivery of correct results.

MANAGEMENT…

- **Service Delivery Approaches**

❑ **There are two major HIV testing and counseling service delivery models;**

- ✓ Health facility-based HIV testing and counseling model and
- ✓ Community-based HIV testing and counseling model Facility-based HTS

❑ HIV testing and counseling approaches in health facilities are:

- ✓ Voluntary Counselling and Testing (VCT)
- ✓ Provider initiated HIV testing and counseling (PITC)

❑ Both approaches are being implemented currently

Management…

Community-based HTS

- Community-based model is one mechanism of ***addressing eligible clients***, who don't appear at health facilities for HIV testing and counseling for different reasons
- Builds public trust and also mitigates issues related to ***stigma*** and ***discrimination***
- Relieves clients from ***transportation*** and other expenses
- ***Earlier identification of HIV positive individual***

Management…

- **Procedures of HTS delivery**

- VCT and PITC service providers should follow the national HTS guideline
- Client registration, Pre-test information, Informed consent, HIV Testing
- Rapid diagnostic tests (RDTs):used for HTS in all settings
- Sensitivity-99%,Specificity- 98%,Positive Predictive Value- 99%
- HIV testing must be done using nationally accepted RDTs following national HIV testing algorithm

MANAGEMENT…

- **Interprofessional Care**

❑ **Interprofessional care of the HIV-infected patient focuses on**

- Monitoring HIV disease progression and immune function,
- Initiating and monitoring ART,
- Preventing the development of opportunistic diseases,
- Detecting and treating opportunistic diseases,
- Managing symptoms,
- Preventing or decreasing complications of treatment, and

- Preventing further transmission of HIV .

Management…

- Drug Therapy for HIV Infection
- The goals of drug therapy in HIV infection are to
  - ✓ Decrease the viral load,
  - ✓ Maintain or increase CD4 cell counts,
  - ✓ Prevent HIV-related symptoms and opportunistic diseases,
  - ✓ Delay disease progression, and
  - ✓ Prevent HIV transmission.

MANAGEMENT…

- **Drug Therapy…**

- HIV cannot be cured, but ART can delay disease progression by decreasing viral replication
  - Adherence: reduce viral loads by 90% to 99%
  - Drugs used to treat HIV work at various points in the HIV replication cycle
  - Combination therapy
    - ✓ Can inhibit viral replication in different ways
    - ✓ Difficult for the virus to recover and decreases drug resistance

Antiretroviral Drugs

Nucleoside reverse transcriptase inhibitors (NRTIs)	Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	Protease inhibitors
Abacavir (ABC) Emtricitabine (FTC) Lamivudine (3TC) Zidovudine (AZT) Tenofovir (TDF)	Efavirenz (EFV) Etravirine (ETV) Nevirapine (NVP)	Atazanavir + ritonavir (ATV/r) Darunavir + ritonavir (DRV/r) Lopinavir/ritonavir (LPV/r
Integrase strand transfer inhibitors (INSTIs) Dolutegravir (DTG) Raltegravir (RAL)		

Management…

Drug Therapy…

- When to Start ART?
  - Start ART as early as possible to all adults and adolescents with a confirmed HIV diagnosis who are ready and willing regardless of their WHO clinical stages and CD4 counts
- TB + HIV patient:
  - Start ART as soon as possible within 8 weeks following initiation of anti-TB treatment regardless of their CD4 count
  - CD4 < 50cells/ml: receive ART within the first 2 week of initiation of TB treatment

Management…

- Drug Therapy…
- What ART regimen to start with (first-line ART)
- Simplified, less toxic, more effective and convenient regimens as fixed-dose combination is recommended for first-line
- Preferred first-line regimens
  - ✓ TDF + 3TC + DTG * OR TDF + 3TC + EFV
- Alternative first-line regimens
  - ✓ AZT + 3TC + EFV/AZT + 3TC + NVP/TDF + 3TC + NV

Management…

- **Monitoring response to ART**

- Monitoring of patients on ART should start from the day of initiation
- Although taking ART is a lifelong commitment, the first six months of therapy are especially important

MANAGEMENT…

- **What to expect in the first months of ART and how to manage them**
- Clinical and immunological improvement and biological suppression are expected when individuals adhere to ART
- But, care providers need to be alert for:
- ✓ **Opportunistic infections**
- ✓ **Early adverse drug events: in the first three months of ART**
- Mortality can be higher in the first three to six months of ART initiation among people with existing co-infections and/or comorbidities, severely low hemoglobin, low body mass index (severe malnutrition) and/or very low CD4 counts

Management…

- Clinical and laboratory monitoring
- ***Clinical assessment of patients and, baseline CD4 count are important***
- Before initiating antiretroviral therapy, patients evaluated at baseline and periodically for toxicity, intolerance, poor response or failure to treatment.
- Before ART initiation patient readiness and thereafter adherence to therapy are always assessed and necessary supports need to be provided.
- Opportunistic infections including TB,Cryptococci infection and other co-morbidities are always need to be looked for and manage

MANAGEMENT…

- **Diagnosis and management of antiretroviral treatment failure**
  - Routine viral load testing is a more sensitive and early indicator of treatment failure.
  - Done at 6 and 12 months of initiating ART and then every 12 months thereafter
  - Used whenever there is clinical or immunologic suspicion of treatment failure

MANAGEMENT…

Clinical failure

- New or recurrent clinical event indicating severe immunodeficiency
- WHO clinical stage 4 condition and
- WHO clinical stage 3 conditions (pulmonary TB and severe bacterial infections)

✓ Indicate treatment failure after 6 months of treatment

MANAGEMENT…

- **Immunologic failure**

- CD4 count at or below 250 cells/mm3 following clinical failure or
- Persistent CD4 levels below 100 cells/mm3.

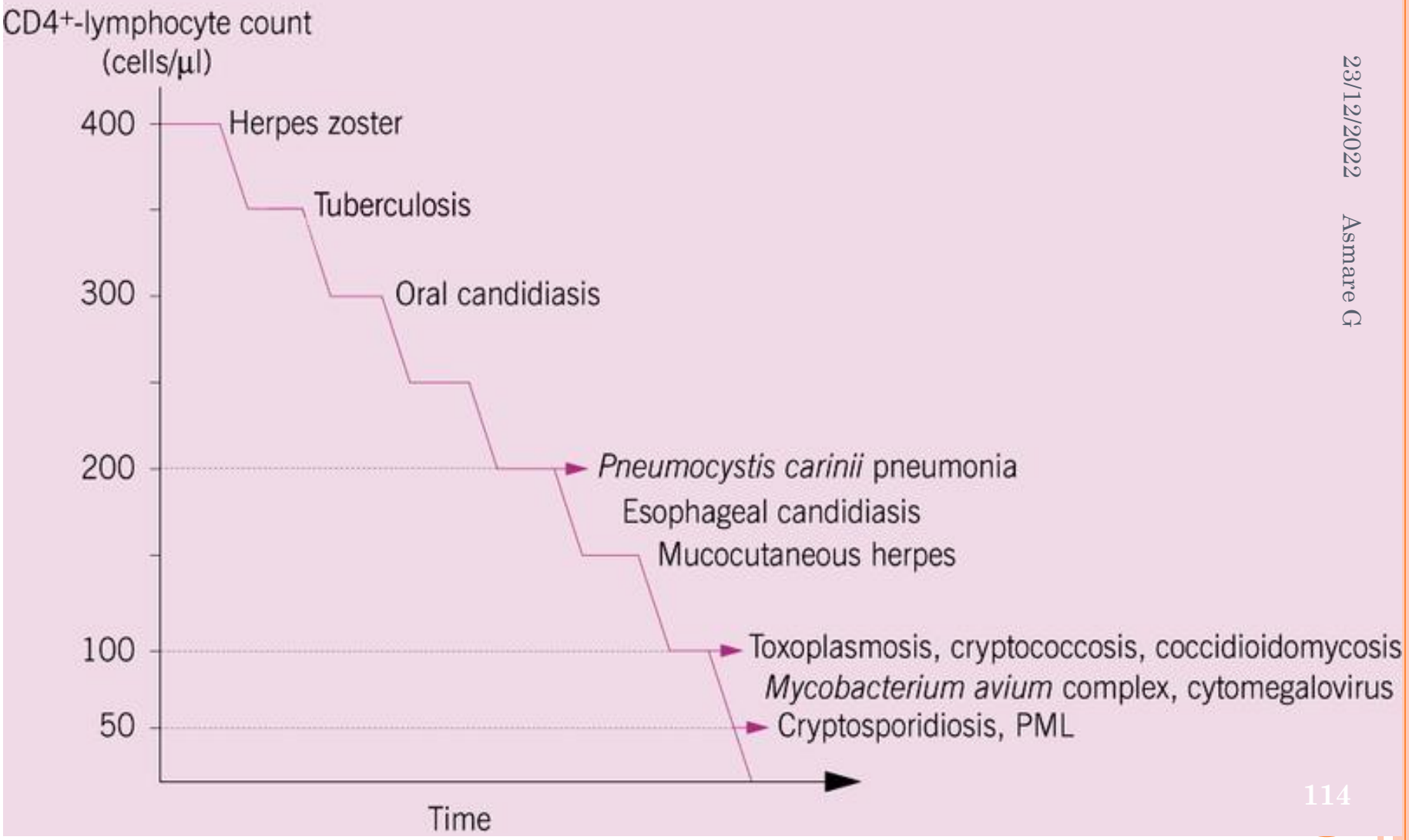
- **Virologic failure**

- Viral load above 1000 copies/ml based on two consecutive viral load measurements in 3 months, with enhanced adherence support following the first viral load test

Management…

- ***Management of Common Co-Infections***
- Opportunistic infections are the predominant causes of morbidity and mortality
- Frequently affected organ systems are the nervous, gastro-intestinal and respiratory systems ,and the skin
- Level of immunity determines the occurrence and type of opportunistic infections
- Milder infections such as herpes zoster and other skin infections occur early
- Life-threatening infections such as CNS toxoplasmosis and Cryptococcal meningitis occur later with severe immune-suppression

ASSOCIATION BETWEEN OPPORTUNISTIC INFECTIONS AND CD4+-LYMPHOCYTE COUNT



Management…

- **General strategies to prevent opportunistic infections are:**
  - Reduction of exposure
  - Chemoprophylaxis (primary/secondary)
  - Immunization and
  - Starting HAART

MANAGEMENT…

- **Management of opportunistic infections:**
  - Co-trimoxazole preventive therapy
  - For prevention of Pneumocystis pneumonia,toxoplasmosis,bacterial infections and diarrhea, as well as benefits for malaria prophylaxis
  - Management of opportunistic diseases of the respiratory system
    - ✓ TB prevention with isoniazid preventive therapy
    - ✓ Bacterial pneumonia, Pneumocystis pneumonia
  - Management of gastrointestinal opportunistic diseases

PREVENTION:

- Preexposure prophylaxis (PrEP)
- Decreasing risks related to sexual intercourse
- Decreasing risks related to drug use
- Decreasing risks of perinatal transmission
- Decreasing risks at work
- Postexposure prophylaxis (PEP)

Prevention…

- Post Exposure Management including Prophylaxis
- Management of Occupational Exposure to HIV
- Risk of HIV infection after a needle stick or cut exposure to HIV-infected blood is estimated to be 0.3% (3 in 1000)
- Antiretroviral treatment immediately after exposure to HIV can reduce risk of infection by about 80%

PREVENTION…

- **Recommended ARVs for PEP and administration guide**
- 2-Drug Regimen:
- Tenofovir (TDF) + Lamivudine (3TC) Once daily 28 days or
- Zidovudine (AZT) + Lamivudine (3TC) 12 hourly 28 days
- 3-Drug Regimen:
- Tenofovir (TDF) / Zidovudine (AZT) + Lamivudine (3TC) + Efavirenz (EFV) or Lopinavir/ritonavir (LPV/r) or Atazanavir/ritonavir (ATV/r) 28 days

Prevention…

- Timing of initiation of prophylaxis:

- As soon as possible (within 1-2 hours)
- Do not consider PEP beyond 72 hours post exposure
- Prophylaxis is to be given for 28 days

"You are either infected or affected by HIV"

Thank you