



# Urogenital Tract Module

## Sexually Transmitted Diseases

### (Syphilis)

### Lecture 6

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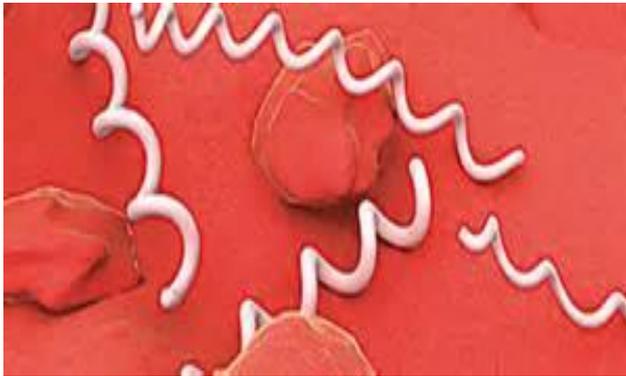


# Etiology of syphilis

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Caused by *Treponema pallidum* which is:

- A member of the spirochete family
- Spiral-shaped (corkscrew shape)



- Gram-negative, thin (0.1-0.2um in diameter) and 5 to 15um long
- Highly motile bacterium
- Rapidly die on drying
- killed by detergents and disinfectants
- Heat sensitive

# Transmission & Epidemiology

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- **Direct contact** with **infectious lesions** of skin and mucous membranes
- **Most commonly** occurs during **sexual activity**.
- Less commonly occurs during non sexual activity
  - Blood transfusions
  - Congenital (during pregnancy)
  - Direct contact with an infectious lesion
- **No** spread through contact with toilet seats, doorknobs, swimming pools, shared clothing, or eating utensils
- The infective dose 50 (ID50) is 60 organisms
- Groups at risk are:
  - ✓ Homosexuals (MSM)
  - ✓ Individuals with HIV
  - ✓ Lower socioeconomic classes in urban areas
  - ✓ Sex workers

# Entry

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The spirochete can reach the subepithelial tissues through

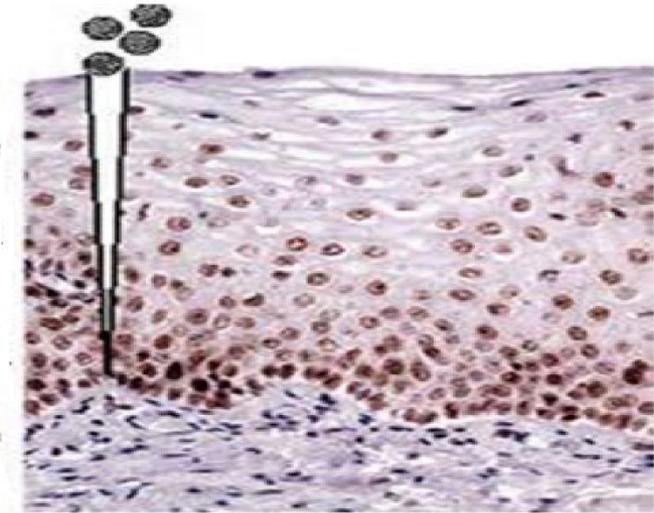
1. Minute abrasions that occurs during sexual intercourse
2. Passage between the epithelial cells of mucous membranes



Then they replicate in the subepithelial tissue



From their they can escape to the systemic circulation



**ectocervix**



**Endocervix**

# Pathogenesis and Clinical Manifestations

## Stages of syphilis

Primary syphilis



Secondary syphilis



Early latent

Late latent



Tertiary syphilis

100 **untreated infected** patients  
with primary syphilis



25% of them will undergo  
secondary syphilis



16% will undergo  
latent syphilis



4% will develop tertiary syphilis

# Pathogenesis and Clinical Manifestations

## Stages of syphilis

❑ *Treponema* causing **obliterating endarteritis**

- **Obliterating endarteritis:**

(inflammation of the intima or inner lining of an artery) that results in an occlusion of the lumen. This obstruction eventually causing necrosis, ulcers, and death of the affected tissue

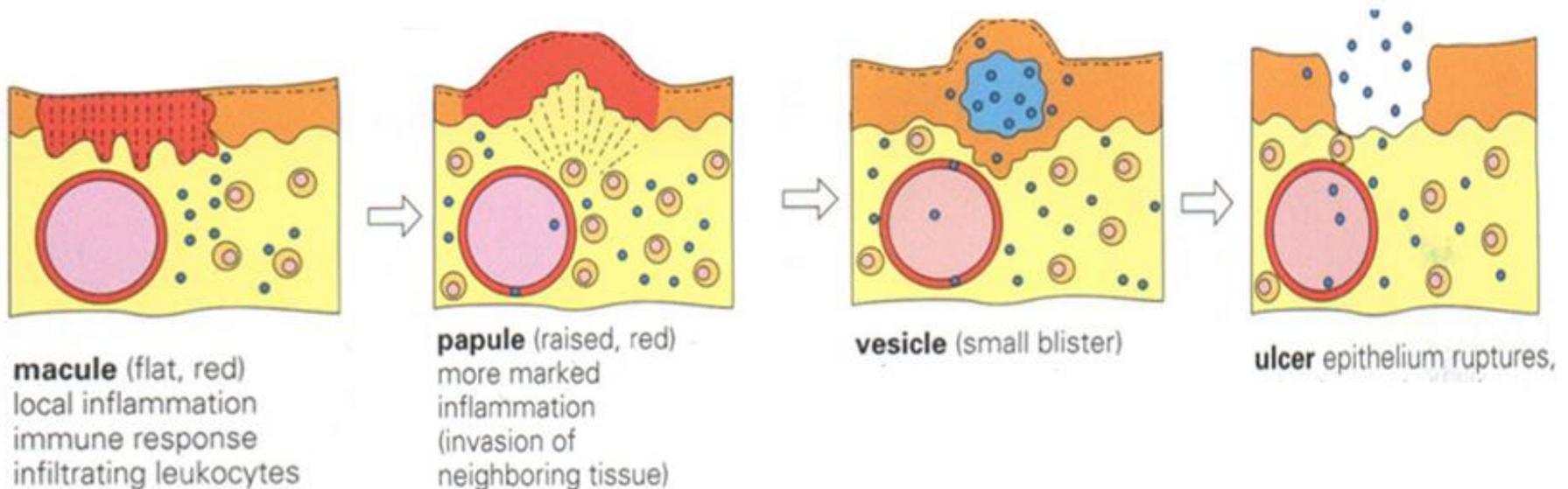


# Pathogenesis and Clinical Manifestations

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## Primary syphilis

- The first symptom of syphilis is **chancre** (sore) develops between 10-90 days after exposure (mean of 21 days) at the site of infection
- The chancre is a **painless** ulcer, **moist** base with **well defined** and **indurated margins**



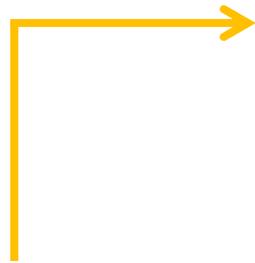
# Pathogenesis and Clinical Manifestations

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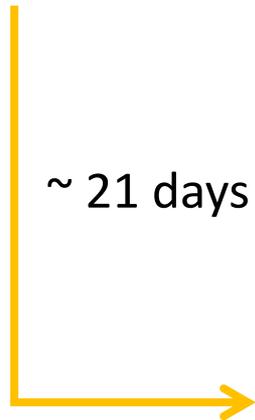
## Primary syphilis



Penetrate  
microabrasions



Systemic spread through blood  
vessels and lymphatics

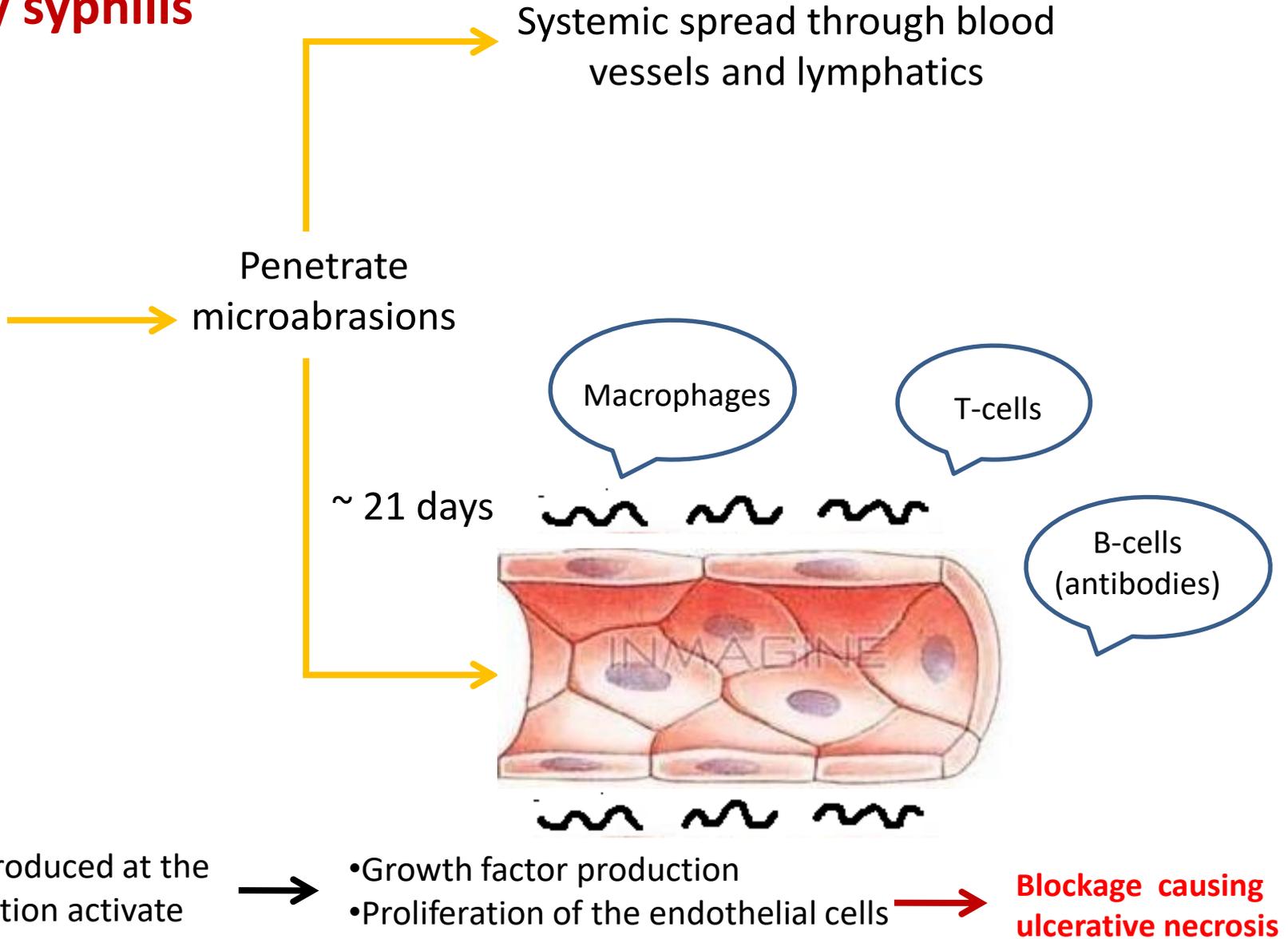


~ 21 days



# Pathogenesis and Clinical Manifestations

## Primary syphilis



# Pathogenesis and Clinical Manifestations

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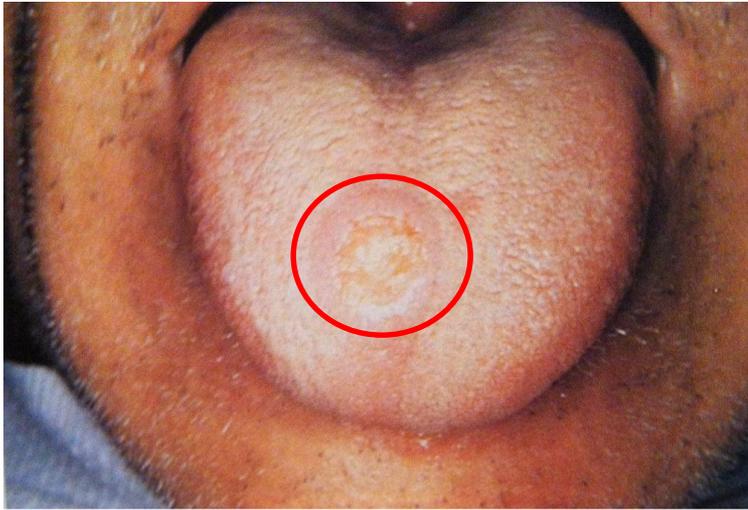
## Primary syphilis

- Highly infectious
- Regional painless and nontender Lymphadenopathy (swollen glands)
- **Systemic dissemination** continues during this period
- The **chancre resolves spontaneously** over a period of 4-6 weeks without treatment to form a **scar**
- **25%** of untreated patients undergo the **secondary syphilis**

# Pathogenesis and Clinical Manifestations

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## Primary syphilis (chancre)



# Pathogenesis and Clinical Manifestations

## Secondary syphilis



Penetrate  
microabrasions

~ 21 days



The chancre resolves  
after 4-6 weeks

Constitutional  
symptoms

maculopapular  
skin rash

Secondary  
syphilis appears  
2-10 weeks after  
the appearance  
of chancre

Other  
complications

# Pathogenesis and Clinical Manifestations

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## Secondary syphilis

- Secondary or disseminated syphilis **develops 2 to 10 weeks after the appearance of the chancre**
- Infection spreads through the blood and lymph system
- Common signs & symptoms include:
  - generalized **nontender lymph node enlargement**
  - **chancre may still be present**
  - fever, malaise and other manifestations of systemic infection
  - **mucoctaneous maculopapular skin rash**
    - palms & soles
    - Abdomen
    - Face
  - condyloma lata: painless, mucosal, warty like rash, develop in warm, moist sites of the genitals and perineum.
  - May affect other organs

# Pathogenesis and Clinical Manifestations

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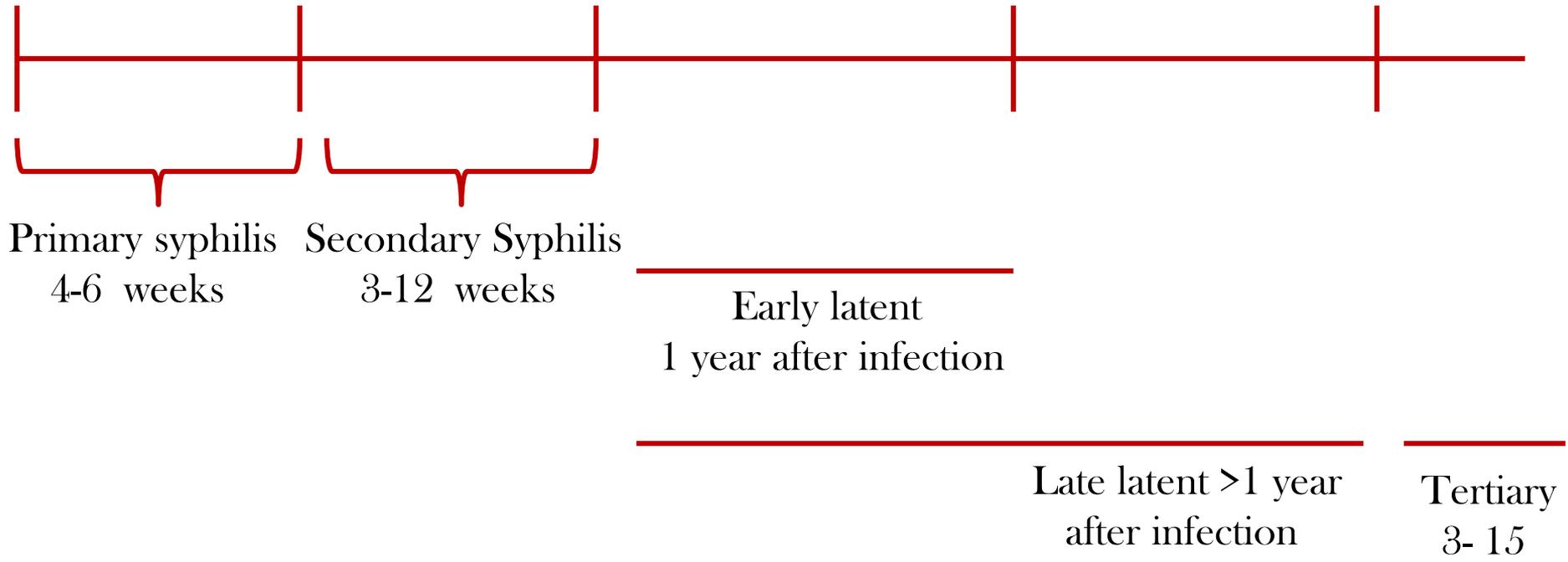
## Secondary syphilis

- Lesions are **highly infectious**
- **Symptoms** resolve spontaneously **after 3-12 weeks**
- Infection is **resolved in only 1/3** of patients
- The illness enters the **latent** state in the remaining **2/3** of patients



# Pathogenesis and Clinical Manifestations

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# Pathogenesis and Clinical Manifestations

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## Latent Syphilis (hidden)

- Latent syphilis is defined as having serologic proof of infection without symptoms of disease
- Divided into:
  - a. **Early latent syphilis**
    - One year or less post-infection.
    - Occasional relapses of active lesions
    - Infectious
    - Transmittable from mother to child, resulting in congenital syphilis
  - b. **Late latent syphilis**
    - is defined as asymptomatic infection of longer than one year post-infection.
    - Non infectious period
    - Transmittable from mother to child, resulting in congenital syphilis
- One third of patients with untreated latent syphilis develop tertiary syphilis



On and off

# Pathogenesis and Clinical Manifestations

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## Tertiary syphilis

- The stage of end organ damage
- The major manifestations occur after 3 to 15 years of primary infection
- Three major forms

### 1- Gummatous syphilis:

- an area of necrosis secondary to endarteritis obliterans
- most commonly found in liver (gumma hepatis), but can also be found in brain, heart, skin, bone, testis, and other tissues.
- the most common



# Pathogenesis and Clinical Manifestations

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## Tertiary syphilis

### 2- Cardiac syphilis:

aneurysm of ascending aorta, aortitis

### 3- Neurosyphilis:

a. meningeal

Looks like  
meningitis

b. Meningeovascular

Looks like ischemic  
stroke

c. paranchymatous

Actual damage of  
neural tissues

# Pathogenesis and Clinical Manifestations

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## Differential diagnosis of painless genital ulcer

1. Chancre:

*(Tryponema pallidum)*

2. lymphogranuloma venerum:

*Chlamydia trachomatis* L1, L2, L3

3. Granuloma inguinale:

*Klebsiela granulomatis*

# Pathogenesis and Clinical Manifestations

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## Congenital syphilis

### ➤ Early congenital syphilis

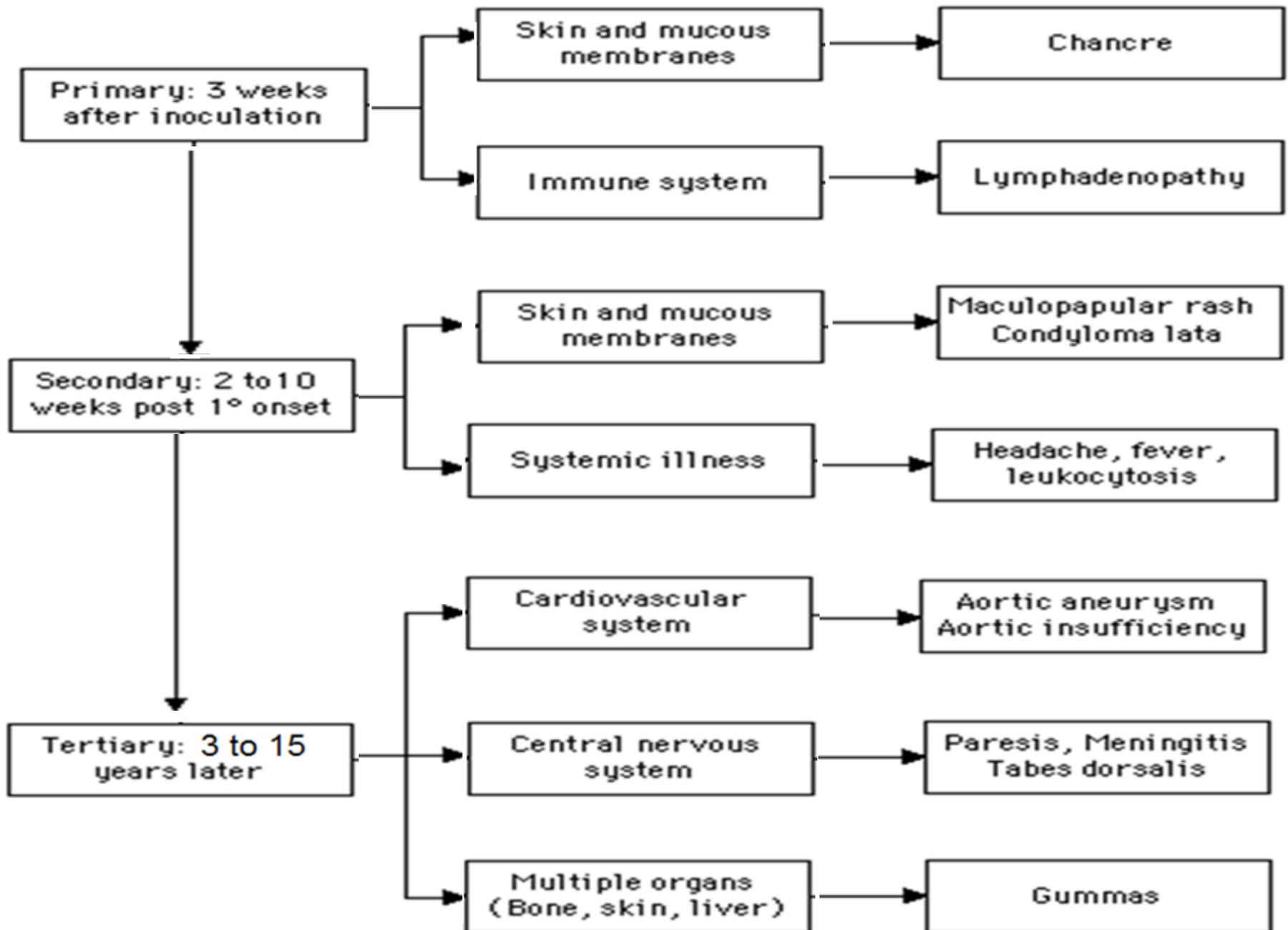
- Early manifestations appearing in the first 2 years of life.
- Resembles severe symptoms of adult secondary syphilis.
- The first symptom seen in up to 50% of newborns with congenital syphilis is snuffles (a nasal discharge in infancy characteristic of congenital syphilis).

### ➤ Late congenital syphilis

- Late manifestations appearing after 2 years.
- Ocular syphilis, arthropathy, gummas.



# Stages and manifestations of syphilis



# Diagnosis

## Syphilis diagnosis relies on:

1. Dark-field microscopy:  
is the most specific technique for diagnosing syphilis when an active chancre or condyloma latum is present
1. Nonspecific serological testing (nontreponemal antibodies)
  - VDRL=Venereal Disease Research Laboratory
  - RPR=Rapid Plasma Reagin
3. Specific treponemal tests (confirmatory test)
  - FTA Antibody-Fluorescent treponemal antibody absorption
  - TPHA test- Treponemal pallidum haemagglutination assay
  - TPPA test- Treponemal pallidum particle agglutination assay



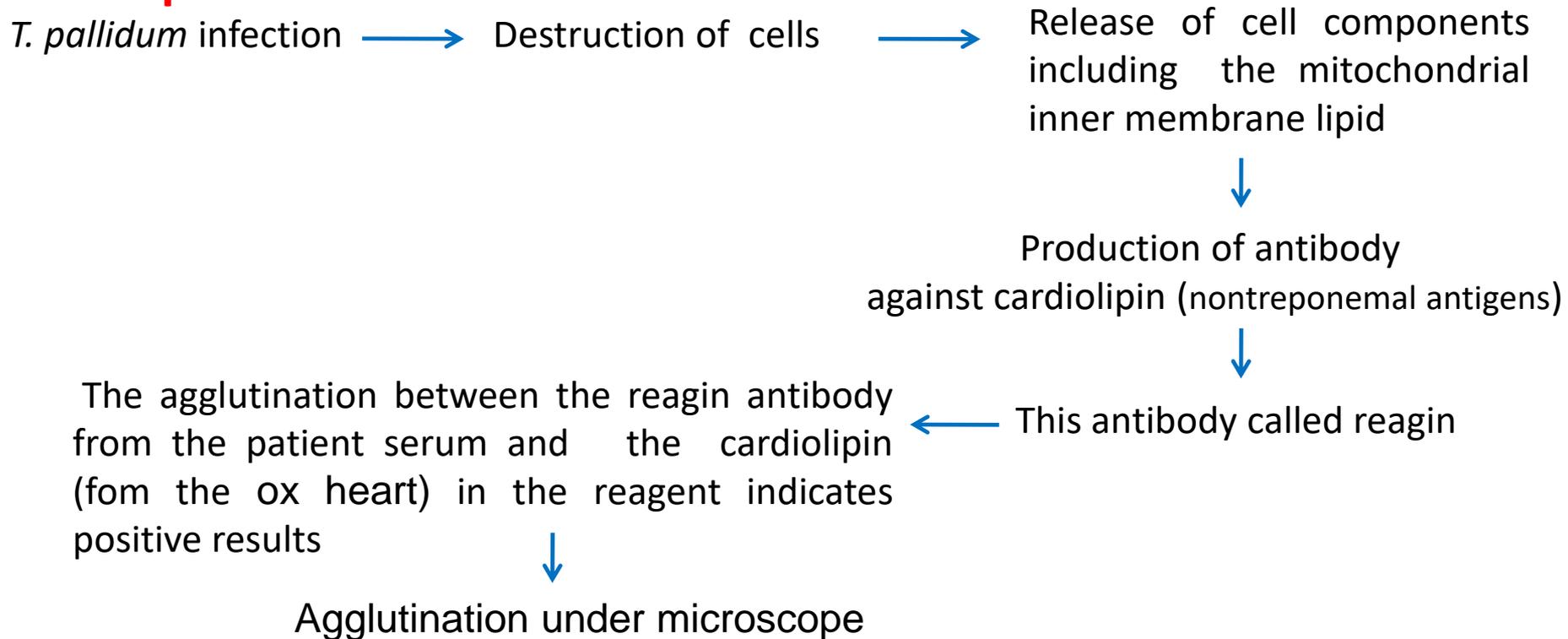
# Syphilis

Methods of laboratory diagnosis of syphilis:

## 2. Indirect detection of spirochetes:

- A. Venereal Disease Research Laboratory (VDRL)
- B. Rapid plasma reagin (RPR)

### Principle



# Diagnosis

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## Congenital syphilis:

Testing for IgM and retesting at 6 months of age, by which time maternal antibody levels have waned. Antibody titers remain elevated in babies with congenital syphilis

# Treatment & Prevention

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## Treatment:

- Penicillin G (2.4 million units I.M)
- If allergic, Doxycycline or erythromycin is a good alternative
- In neurosyphilis use penicillin and Doxycycline together

## Prevention:

- No vaccine
- Early diagnosis and treatment of case and contact is important
- Test for syphilis if any STD exists

# Case

Mr. B., a 24 years old homosexual man, came to the clinic with

- ✓ **Fever**
- ✓ **swollen lymph nodes**
- ✓ **spotty discoloration of his skin, most notably on the palms and soles.**
- ✓ He had recently noted a penny –sized, gray, translucent lesion on the inner aspect of his lower lip.

**Mr. B reported that he engages in oral sex as well as anal-receptive intercourse**

- Doctor recognized the macular rash on his palms and soles and the lesion on his lip as a characteristic of secondary syphilis.

## **The lab reported:**

- Corkscrew appearance under darkfield microscope
- Positive serology for specific anti-treponemal antibodies

## **Treatment**

- He was treated with a course of penicillin and his lesions and symptoms abated

## **He was considered cured when the:**

- RPR drop 4 fold by 6 months(Test of cure)

## Key Words

**Spirochete**

***Treponema pallidum***

**Syphilis**

**Chancre**

**Primary lesion**

**Darkfield microscopy**

**Secondary Lesion**

**Tertiary Lesion**

**VDRL**

**RPR**