

# 梅毒 (Syphilis)

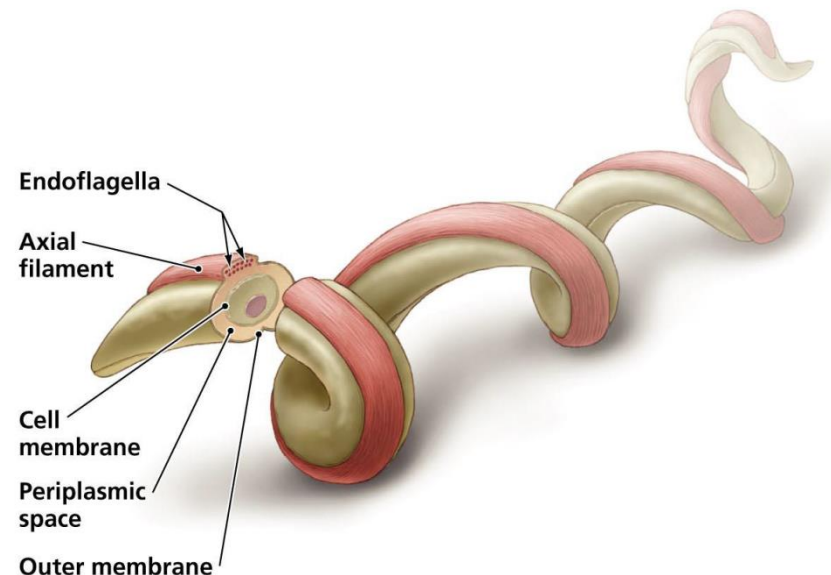
# 大綱 (Outline)

- Introduction (簡介)
- Diagnosis (診斷)
- Treatment (治療)
- Prevention (防治)

# Introduction

- **Syphilis (梅毒)**

- Pathogen : *Treponema pallidum* (梅毒螺旋體)
- Mode of transmission :
  - Transfusion of blood
  - Intercourse or sexual behavior
  - Trans-placental
  - Percutaneous following contact with infectious lesions
- Incubation period : 10-90 days



# Epidemiology of Syphilis

- **Epidemiology**

- Worldwide
- 20-35 year
- city > country
- Risk factor :
  - Multiple sexual partners
  - Prostitute
  - MSM (men sex with men)

## **Taiwan**

- Gender : male
- Age : 30-49 year, 70 year cured
- Area : Taipei

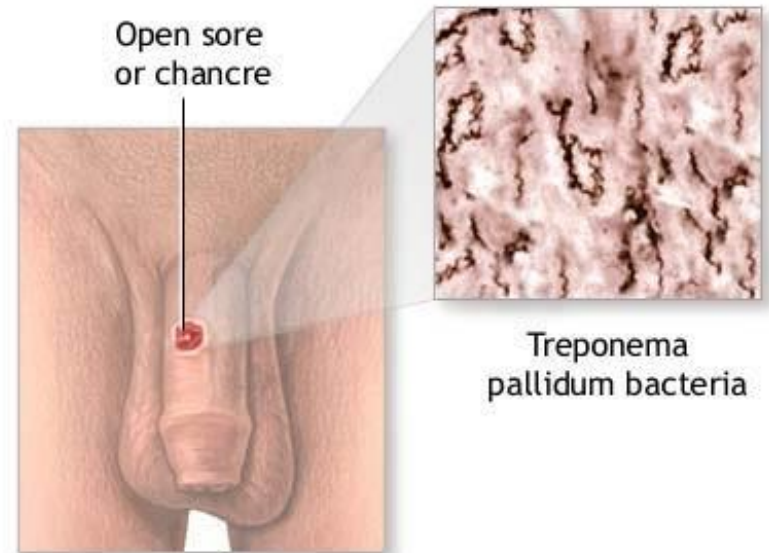
# Clinical Manifestations

- **Primary (初期梅毒)**

- 2-4 weeks
- Highly contagious

## Symptom

- Painless sore
- Chancre



# Clinical Manifestations

- **Secondary (二期梅毒)**

- 4-6 weeks
- Highly contagious

## Symptom

- Rash
- Fever
- Lymphadenopathy
- Malaise
- Syphilitic alopecia



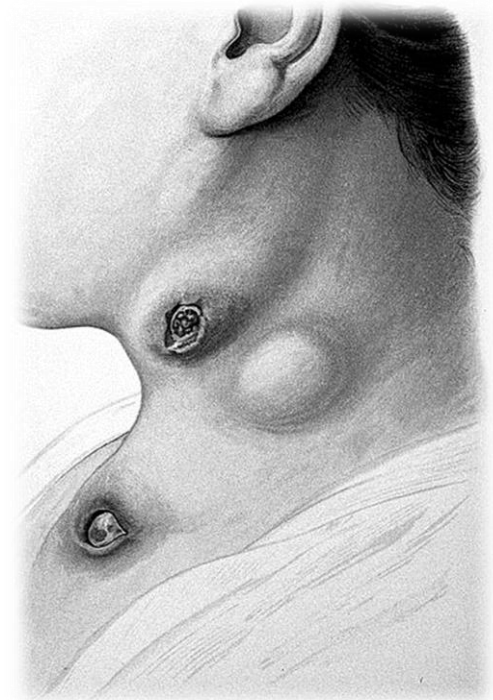
# Clinical Manifestations

- **Tertiary (三期梅毒)**

- 3-7 years
- contagious

## **Symptom**

- Organ damage
- Gumma
- CNS invasion
- Cardiovascular invasion



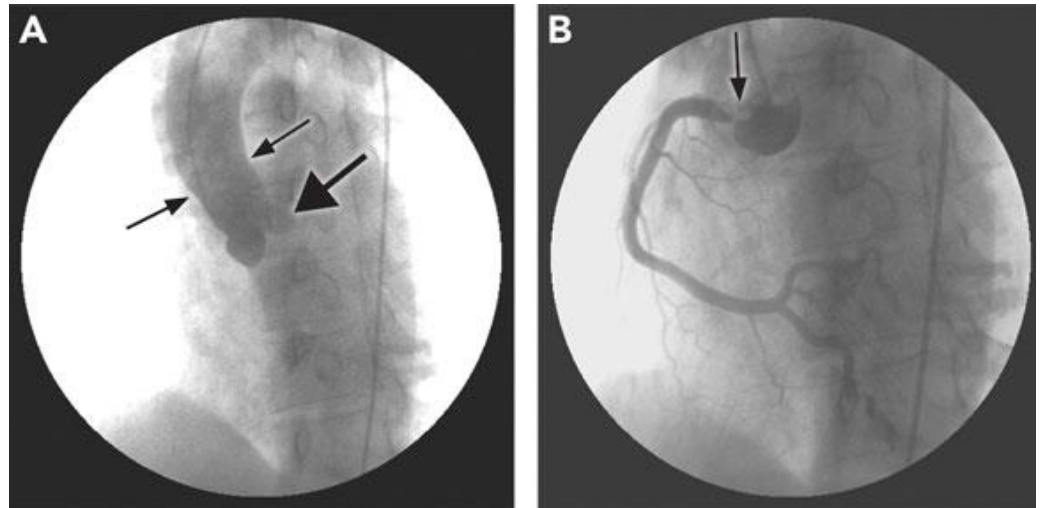
# Clinical Manifestations

- **Cardiovascular (心臟性梅毒)**

- Derived from Tertiary syphilis without treatment
- Male > Female ; Black > Caucasian

## Symptom

- coronary artery stenosis
- chest pain
- heart attack
- heart failure



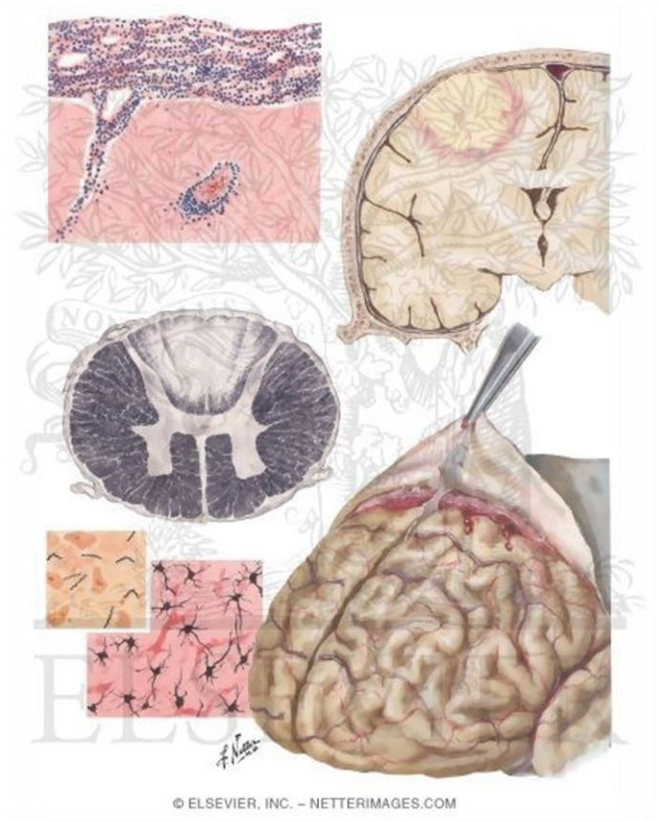


# Clinical Manifestations

- **Nervous system (神經性梅毒)**
  - Derived from Tertiary syphilis without treatment
  - Male > Female ; Caucasian > Black

## Symptom

- Headache
- Memory loss
- Epilepsy
- Dementia paralytica



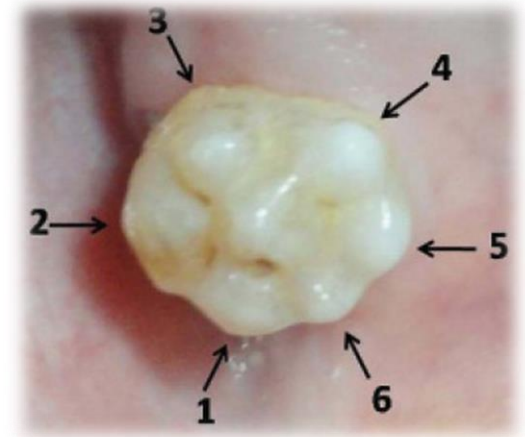
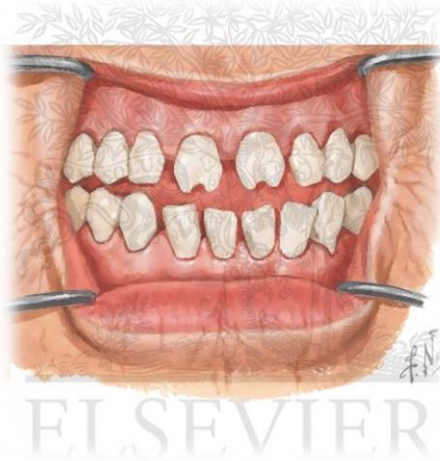
# Clinical Manifestations

- **Congenital syphilis (先天性梅毒)**

- non-hereditary
- Syphilis can't transmit across placenta in 4 month of pregnancy

## Symptom

- Vesicular lesions instead of chancre (secondary syphilis)
- Hutchinson's Teeth
- Mulberry molar (第一白齒桑葚狀)



# Clinical Manifestations

- **Latent (隱性梅毒)**
  - **Early latent :**
  - Asymptomatic  $\leq 1$  year
  - contagious
  
  - **Late latent :**
  - Asymptomatic  $> 1$  year
  - weakly contagious

# Diagnosis

## The Common Methods

- **Serology**
  - Mainstay for syphilis testing
  - Two classes of serologic tests
    - Non-treponemal
    - Treponemal

## The Uncommon Methods

- Rabbit Infectivity Test (RIT) : Limited to research settings
- Dark Field Microscopy : Useful only during primary infection
- Immunostaining : Direct fluorescent antibody or silver stain
- Polymerase Chain Reaction (PCR) : Not commercial available

# Diagnosis

## Non-treponemal tests :

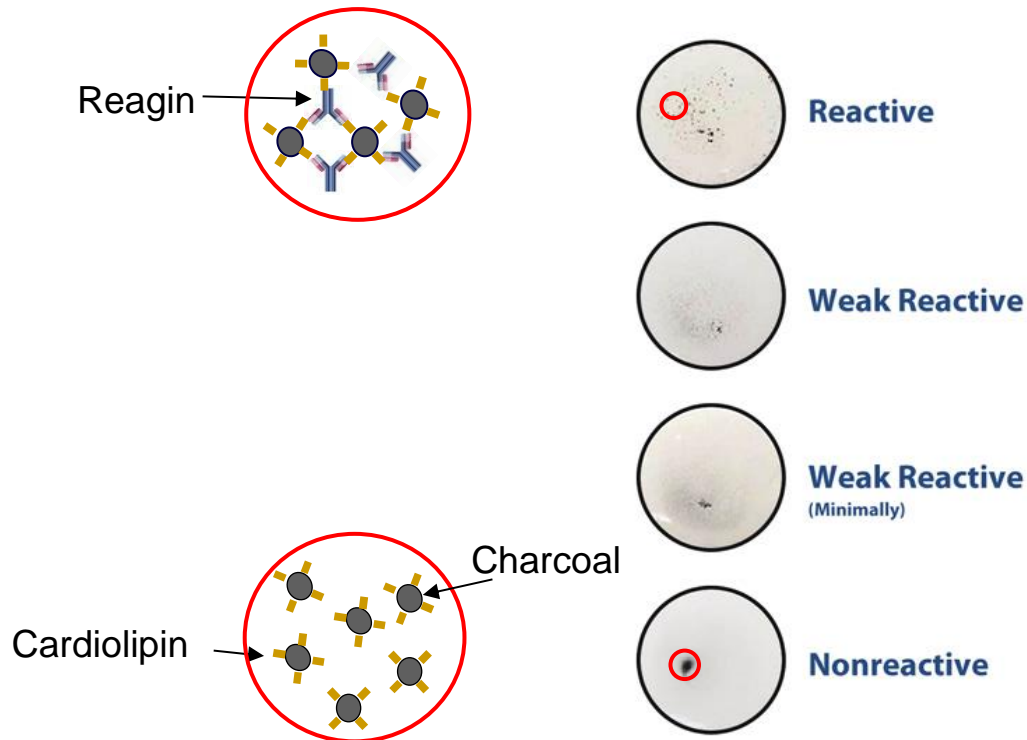
- Rapid Plasma Reagin (RPR)
- Venereal Disease Research Laboratory (VDRL)

## Principle :

- *T. pallidum* infection leads to the production of reagin
  - **Reagin** – Antibodies to substances released from cells damaged by *T. pallidum*
- Reagin reacts with cardiolipin
  - **Cardiolipin** – a phospholipid component of certain eukaryotic and prokaryotic membranes

# Diagnosis

RPR and VDRL are agglutination assays



# Diagnosis

## Non-treponemal tests :

- **Advantages**

1. Rapid turnaround time – Minutes
2. Inexpensive
3. No specialized instrumentation required
4. Usually revert to negative following therapy
5. Can be used to monitor response to therapy

- **Limitations**

1. Results are subjective
  - Intra- and Inter-laboratory variability
2. Non-specific :
  - False positive can result from other infectious or non-infectious conditions (EBV, Lupus, Autoimmune disease, etc.)
3. Limited sensitivity in early/primary syphilis and in late/latent syphilis

# Diagnosis

- **Treponemal Assays :**

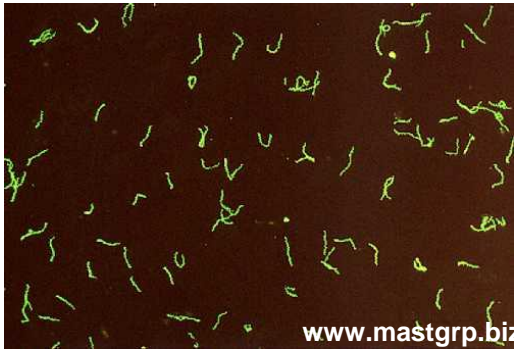
- Fluorescent treponemal antibody (FTA-ABS)
- Treponema pallidum particle agglutination (TP-PA)
- Enzyme Immunoassay (EIA)
- Multiplex Flow Immunoassay (MFI)
- Microhemagglutination assay (MHA)

- **Principle :**

- Infection leads to production of specific antibodies directed against *T. pallidum*
- Treponemal tests detect IgG or total IgM/IgG antibodies directed against *T. pallidum*



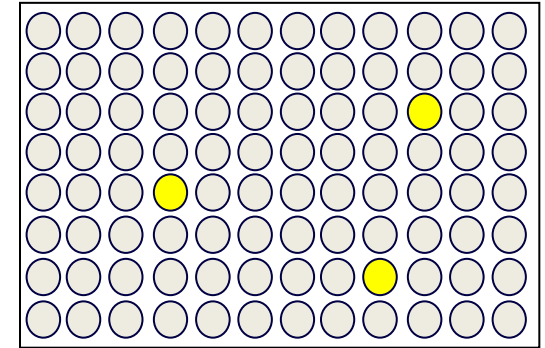
FTA-ABS



TP-PA

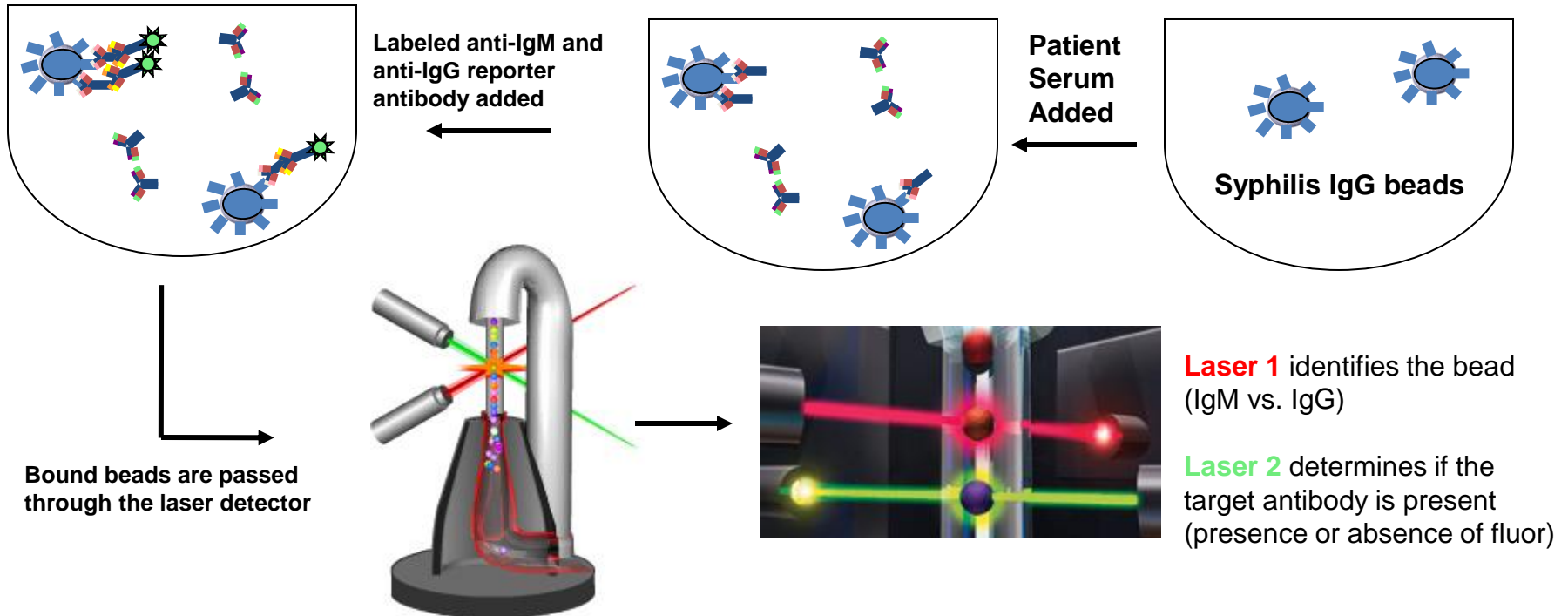


Conventional EIA



Yellow wells = positive

### Multiplex Flow Immunoassay (MFI)



# Diagnosis

## Treponemal Assays :

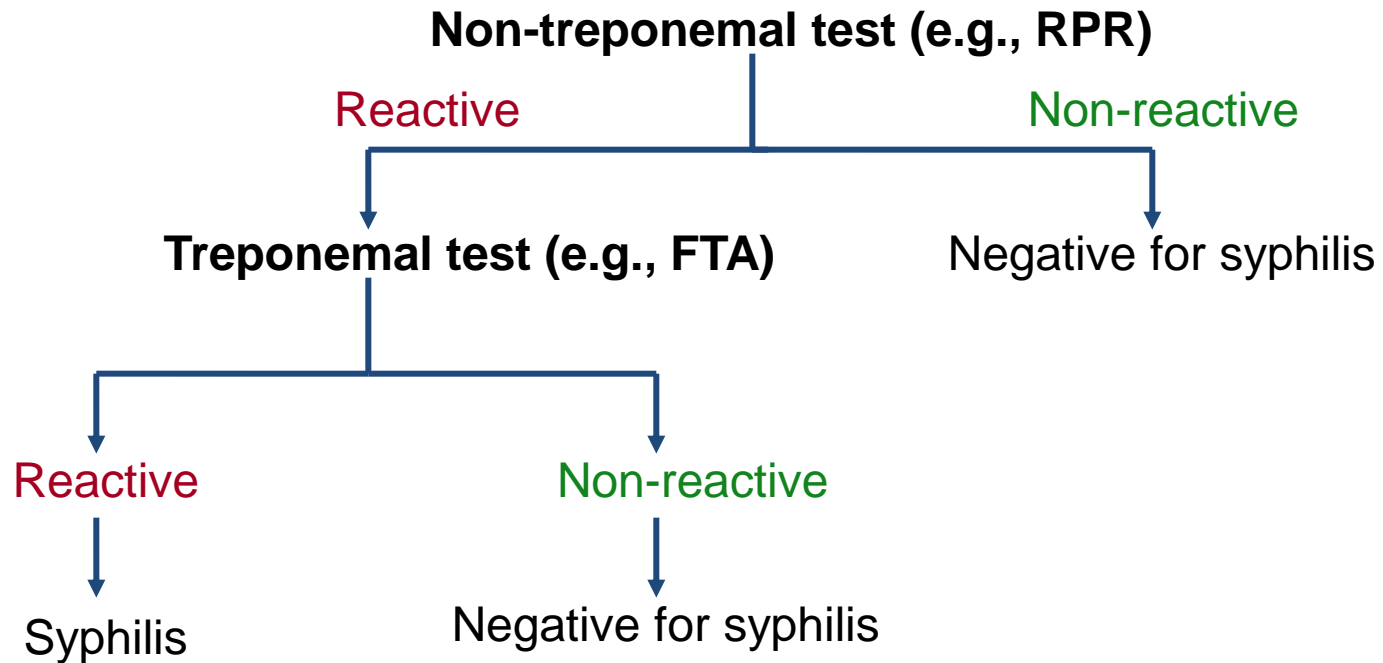
- **Advantages**

1. High Specificity
2. Possibly higher sensitivity during early and late syphilis stages compared to non-treponemal tests
3. Newer Methods
  - Objective result interpretation
  - Automation option
  - High throughput
  - High reproducibility/precision

- **Limitations**

1. Remain positive despite treatment
  - Cannot be used to monitor response to therapy
2. Conventional Methods
  - Subjective interpretation requiring technician expertise to read
3. Expensive instrumentation and higher cost/test

# Syphilis Screening Algorithms: Traditional versus Reverse Screening



## 病例定義（**Case definition**）

### （一）梅毒通報範圍

1、活性梅毒通報定義：同時符合通報條件1+2 或僅符合通報條件3 者。

2、非活性梅毒通報定義：僅符合通報條件2 者。

### （二）通報條件

1、臨床症狀出現硬下疳或全身性梅毒紅疹等臨床症狀。

2、未曾接受梅毒治療或病史不清楚者，**RPR（+）或VDRL（+），且TPHA=1**  
：**320 以上(包括320)**。

3、曾經接受梅毒治療者，**VDRL 價數上升四倍**。

（三）需**1 週內**通報。

- ( 1 ) 一期、二期或早期隱性梅毒–適用長效盤尼西林，1次注射完成治療；對不能每天接受注射，以及合作程度不好的病人最適宜。方法：  
：診斷後即時接受Benzathine penicillin, 2.4 m.u. IM ST
- ( 2 ) 對盤尼西林過敏之病患–可用下列任一種方法：
  - Doxycycline, 100 mg bid p.o. x14 days
  - Tetracycline, 500 mg q6h p.o. x14 days
- ( 3 ) 晚期梅毒
  - Benzathine penicillin, 2.4 m.u. IM qw x3 weeks
- ( 4 ) 神經性梅毒–下列任一種方法：
  - Crystalline penicillin G, 2~4 m.u.IV q4h x10~14 days
  - Crystalline penicillin G, 2~4 m.u.IM + probenecid
  - 500mg p.o. q4h x10~14 days