# Syphilis 101
# for the Public Health Nurse


Jonathan Vilasier Iralu, MD, MACP, FIDSA

Indian Health Service

Chief Clinical Consultant for

Infectious Diseases

# DISCLOSURE STATEMENT

Disclosure Statement: As a jointly accredited provider of continuing education, the IHS Clinical Support Center must ensure balance, independence, objectivity, and scientific rigor in its educational activities. Course directors/coordinators, planning committee members, faculty, reviewers and all others who are in a position to control the content of this educational activity are required to disclose the existence of all financial relationships with ineligible companies within the prior 24 months. Safeguards against commercial bias have been put in place. Faculty will also disclose any off-label and/or investigational use of pharmaceuticals or instruments discussed in their presentation. All those who are in a position to control the content of this educational activity have completed the disclosure process and have indicated that they do not have any relevant financial relationships or affiliations with any manufacturers or commercial products to disclose.

There is no commercial interest support for this educational activity.

# Disclaimer

The views expressed in this presentation are those of the speaker and do not necessarily represent the views, policies, and positions of the Indian Health Service (IHS), or the U.S. Department of Health and Human Services (HHS).

# Objectives

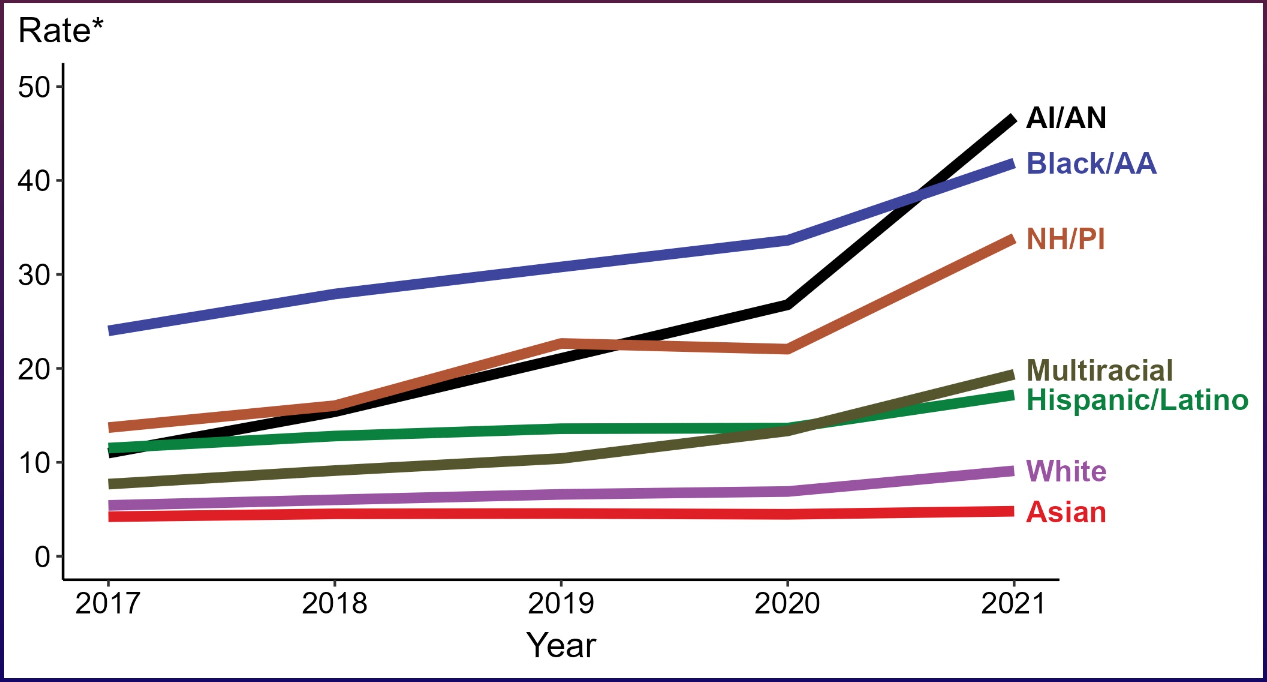
At the end of this presentation, participants will be able to:

1. Examine the epidemiologic trends of syphilis in Indian Country.
2. Identify and stage syphilis cases (primary, secondary, early latent, late latent).
3. Provide the proper treatment for syphilis in accordance with current CDC guidelines.

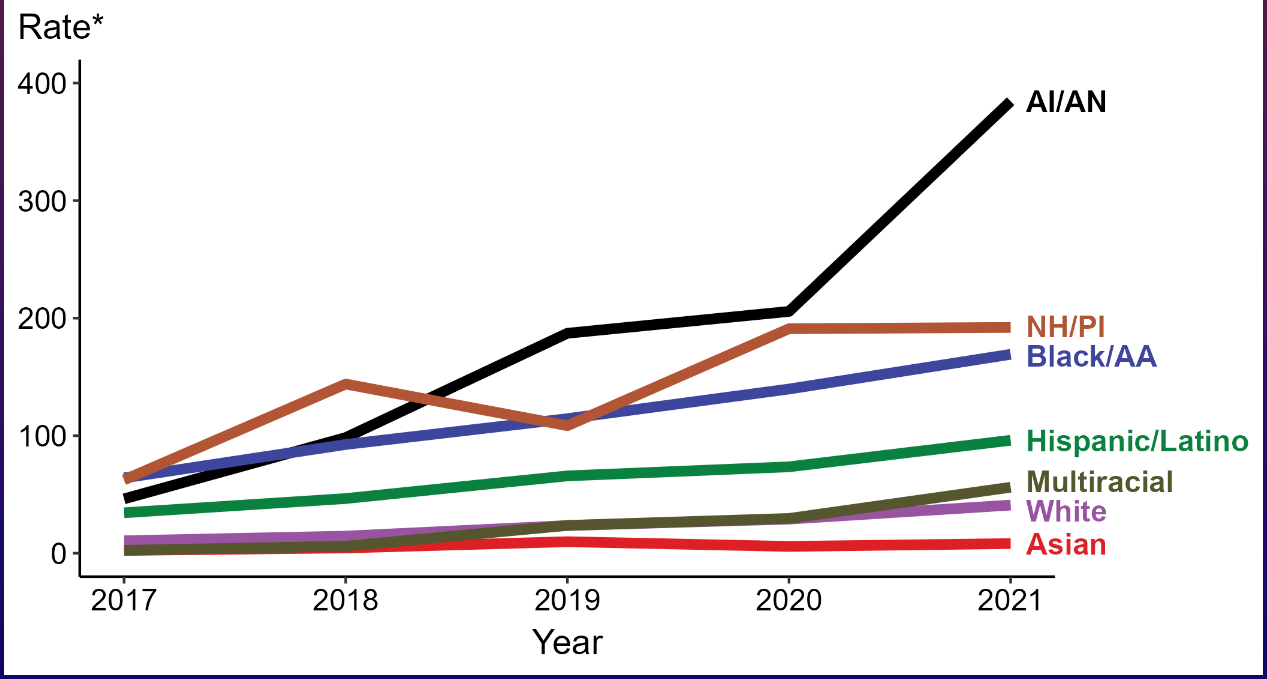
# Case Presentation

- A 26 year-old woman walks in to the OB-GYN clinic to request pregnancy testing. She is asymptomatic with no complaints. Physical exam is completely normal including eye, skin, neurologic and pelvic examination. She opted in for HIV and STI testing as part of the prenatal bundle. The tests come back negative except for a positive screening syphilis EIA and a reflex RPR titer of 1:16 dilutions.

# Primary and Secondary Syphilis — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2017–2021



# Congenital Syphilis — Rates of Reported Cases by Year of Birth, Race/Hispanic Ethnicity of Mother, United States, 2017–2021



# Syphilis Overview

- Sexually transmitted disease
- Caused by *Treponema pallidum,* a microaerophillic, corkscrew shaped bacteria

# Syphilis Transmission

- Transmission by
  - Sexual contact
  - Passage through placenta
  - Kissing or other contact with active lesion
  - Transfusion of blood
  - Accidental direct inoculation

# Syphilis Pathophysiology

- *T pallidum* divides every 30 to 33 hours
- Invades locally but disseminates widely
  - 30% of 58 patients with early syphilis in one study had organisms isolatable from CSF
- Local lesions are marked by plasma cell, lymphocyte and histiocyte infiltration first then capillary proliferation and finally, necrosis with ulceration.

# Syphilis
## Primary Chancre, Penile Shaft

Mosby STD Atlas, 1997

CALIFORNIA STD/HIV PREVENTION TRAINING CENTER

# Primary Syphilis Findings

- <u>Primary Syphilis</u> **(21 day incubation)**
  - Chancre (heals 3-6 weeks)
  - Regional lymphadenopathy (starts 1 wk. later)
  - RPR/VDRL positive in 78% (74-87% range)

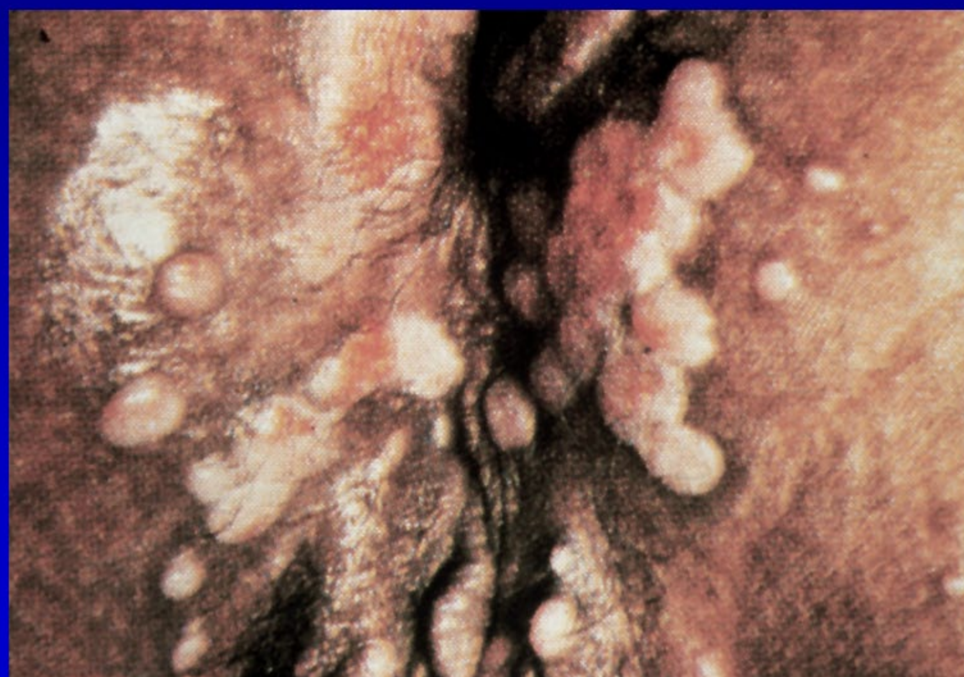
  - ***HIV positive patients have multiple chancres in 25% of cases***

# Rash of Secondary Syphilis
## Papular Form

Mosby *STD Atlas, 1997*

CALIFORNIA STD/HIV PREVENTION TRAINING CENTER

# Secondary Syphilis
# Condyloma Lata



CALIFORNIA STD/HIV
PREVENTION TRAINING CENTER

# Mucous Patches of Secondary Syphilis

# Syphilis Clinical Stages

- Secondary Syphilis (2-8 weeks post chancre)
  - palmar/plantar rash
    - macular, papulosquamous, pustular syphilides
  - condylomata lata/mucous patches
  - Patchy alopecia (moth eaten appearance)
  - Pharyngitis, epitrochlear adenopathy, myalgia, weight loss, aseptic meningitis 1-2%, proteinuria, hepatitis, uveitis
  - RPR/VDRL positive in 100% of cases

# Latent Syphilis

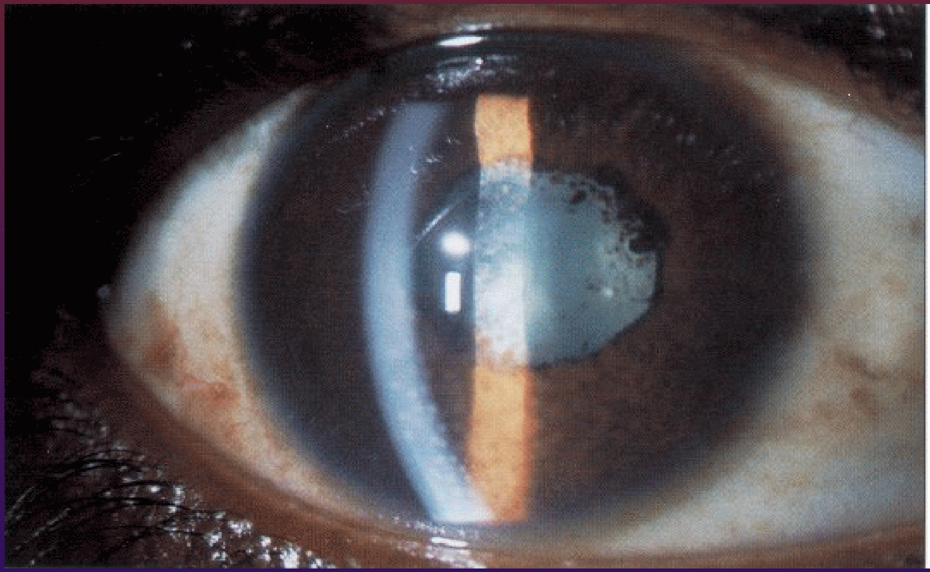
**Latent syphilis = positive serology with no symptoms or signs**

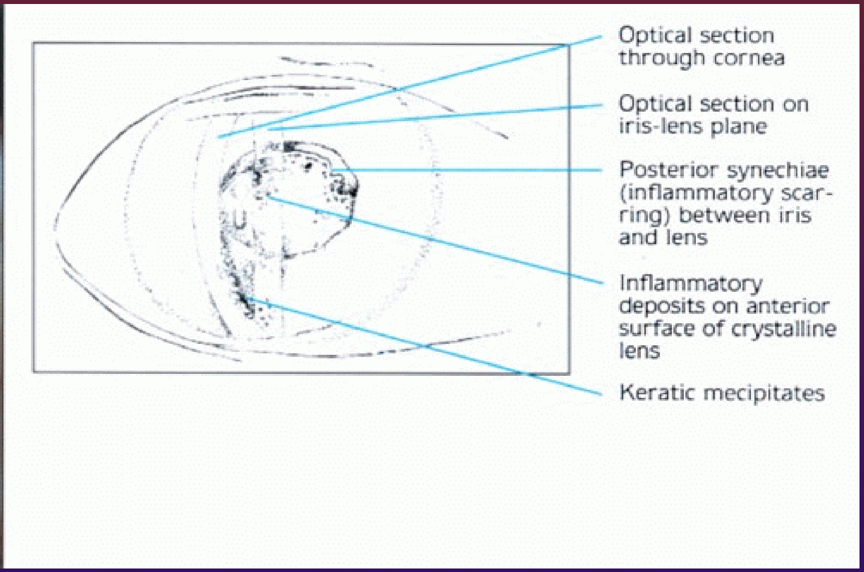
- **Early Latent Syphilis:**
  - **Seroconversion within the last year**
  - **primary or secondary syphilis within 1 year**
  - **Contact of a primary, secondary or early latent case**
- **Late Latent Syphilis:** **present > 1 year**
- **Latent Syphilis of Unknown Duration:** **No prior serology in chart**

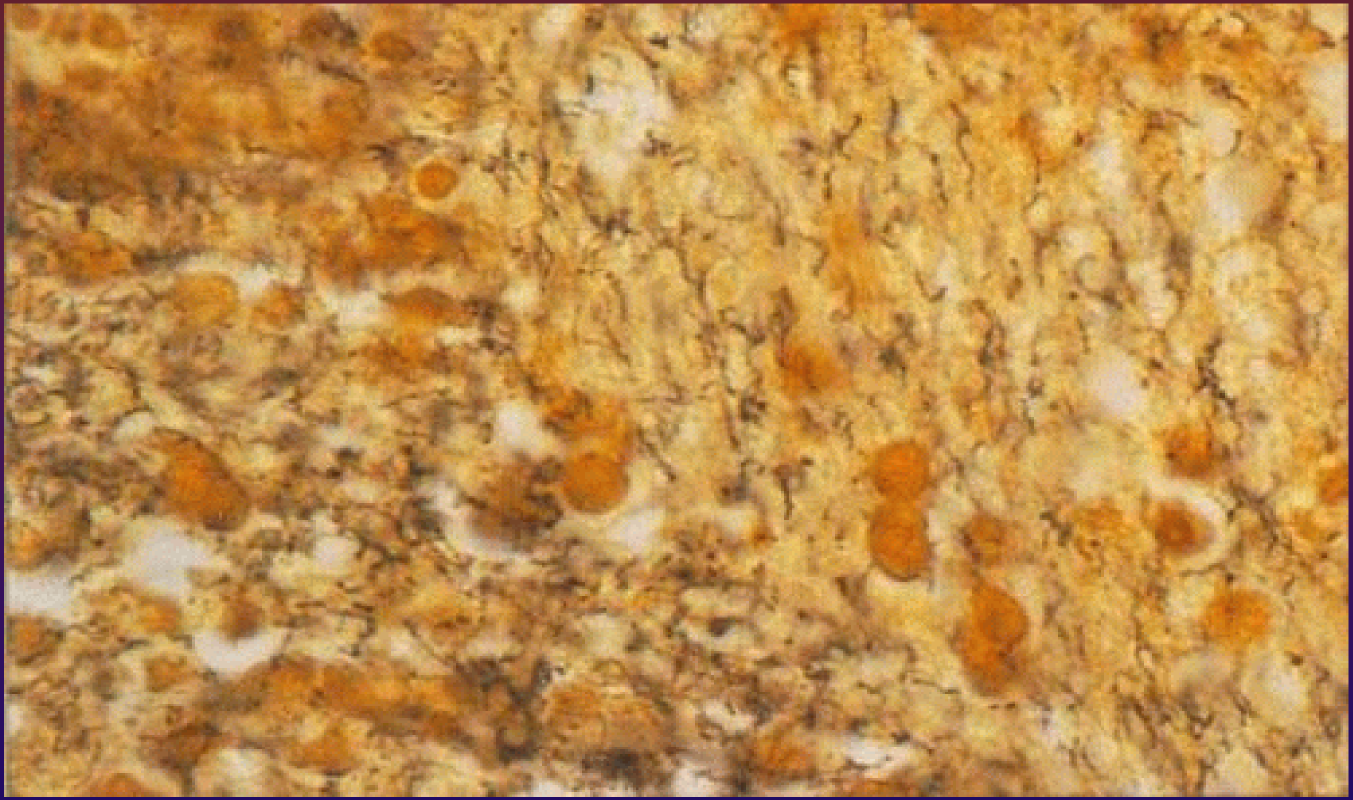
# Neurosyphilis happens at any stage

- **Meningovascular (infarction)**
  - **Stroke syndromes (aphasia, hemiparesis, seizures)**

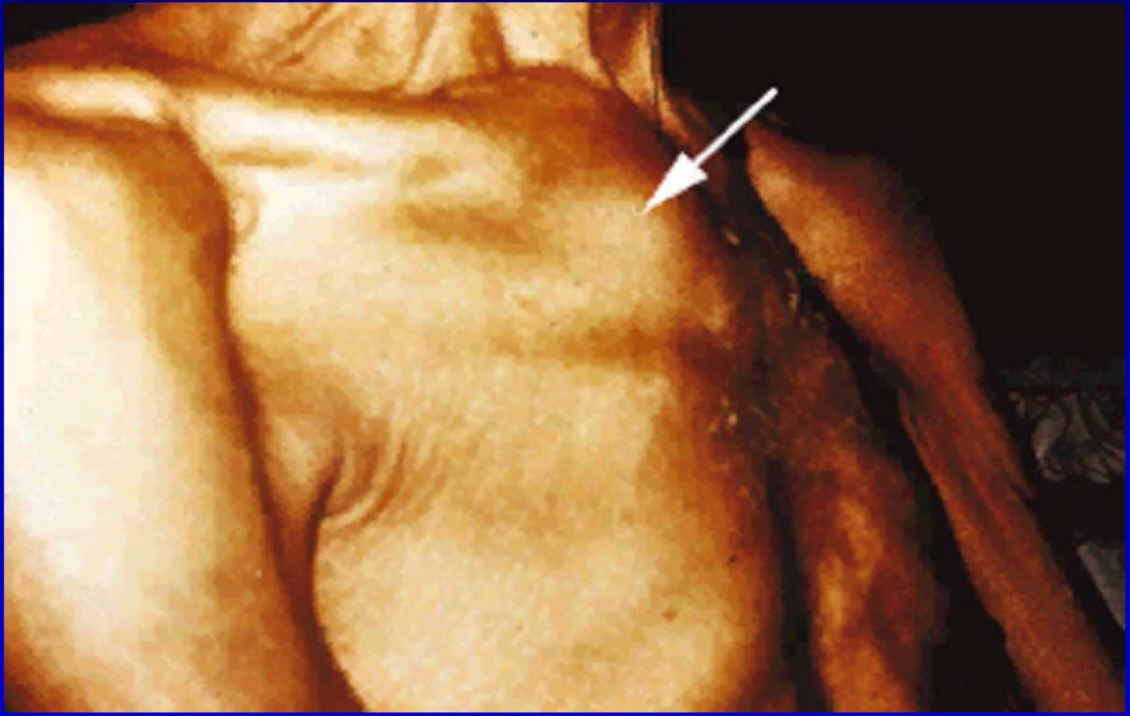
- **Parenchymal (neuron destruction)**
  - **Tabes dorsalis (foot slap, wide based gait, lightning pains, (+) Romberg, Charcot Joints)**
  - **General paresis (Personality, Affect, Reflexes, Eye, Sensorium, Intellect, Speech)**
  - **Other: Gunbarrel sight (optic atrophy), uveitis, CN VII and VIII palsy, syphilitic otitis (deafness and tinnitus)**




Optical section through cornea
Optical section on iris-lens plane
Posterior synechiae (inflammatory scar-ring) between iris and lens
Inflammatory deposits on anterior surface of crystalline lens
Keratic mecipitates



# Tertiary Syphilis
# Aortic Aneurysm



Mosby *STD Atlas, 1997*

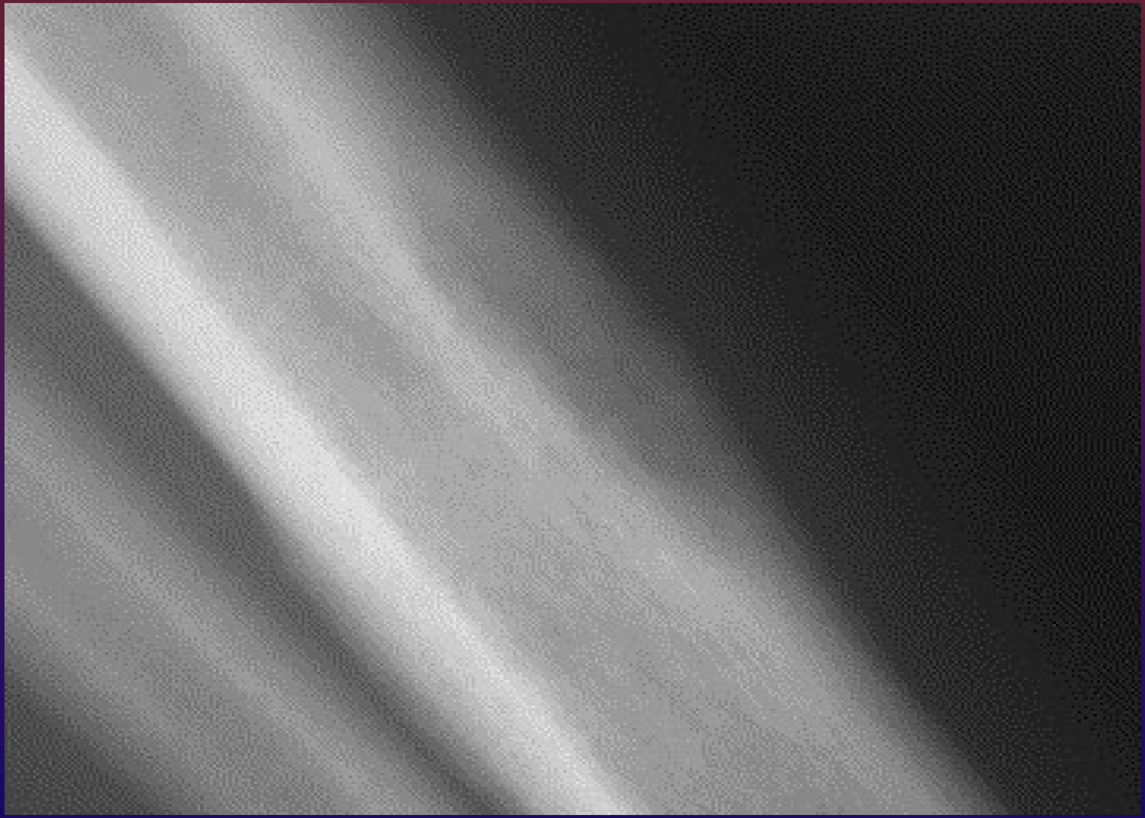
CALIFORNIA STD/HIV
PREVENTION TRAINING CENTER

# Tertiary Syphilis
# Ulcerating Facial Gumma

Mosby *STD Atlas, 1997*

CALIFORNIA STD/HIV PREVENTION TRAINING CENTER

# Syphilitic periostitis



# Tabes dorsalis

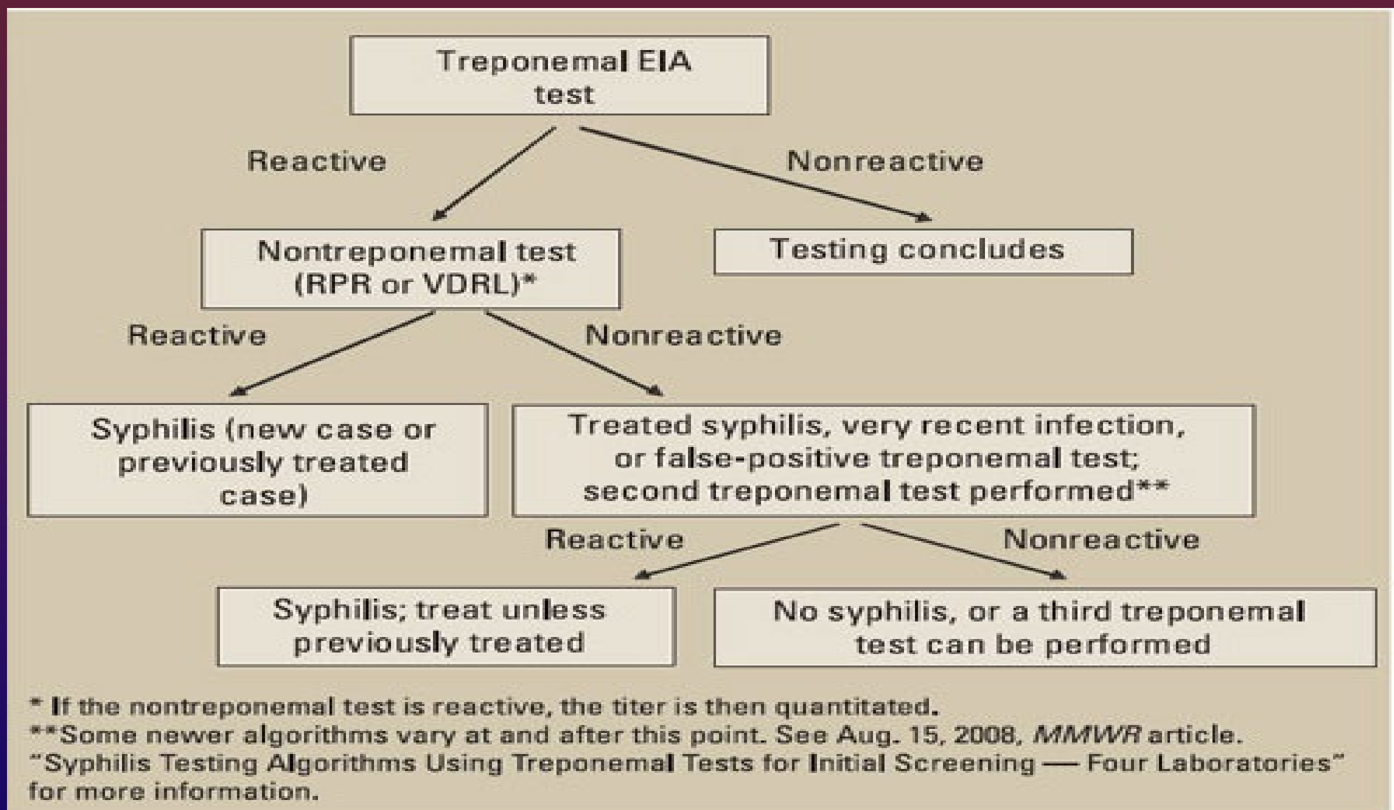
# Other Tertiary Syphilis Dx

- <u>Cardiac Syphilis</u>
  - Aortitis-endarteritis obliterans of vasa vasorum
    - **Saccular aortic aneurysm**
  - Secondary aortic insufficiency due to expanding aortic root
- <u>Benign Gummatous Syphilis</u>
  - Develop in 10 years if HIV negative
  - ***Develop in months if HIV positive***

# Syphilis Diagnosis

- We used to do RPRs first the reflex to confirmatory TPPA
- Many labs now do an EIA first, then RPR
- Doing EIA first saves money
- What to do if RPR is negative?

# Syphilis diagnosis reverse algorithm



# Syphilis Management

- <u>Primary and secondary Syphilis</u>
  - Dark-field exam of skin lesions if available
  - Draw RPR and HIV serology
  - Administer Benzathine penicillin 2.4 mU IM x 1
    - Consider giving a second dose 1 week later if pregnant
  - R/O optic/neurosyphilis if symptomatic
  - Check RPR at 6 and 12 months-
    - **if < 4-fold drop at 12 months:**
      - **Offer Lumbar Puncture**
      - **re-check HIV serology**
      - **re-treat with three weekly doses of LAB if LP negative.**

# Syphilis Management

- <u>Latent Syphilis</u>
  - Check RPR (reflex MHA TP) and HIV test
  - Careful genital exam
  - LP if symptomatic, tertiary lesion, treatment failure
  - Give Benzathine PCN 2.4 mU IM
    - <u>Treat once if early latent</u> (consider second dose in a week if pregnant)
    - <u>Treat weekly x3 if late latent</u> or latent syphilis of unknown duration.

# Syphilis Management

- Latent syphilis follow-up
  - RPR at 6, 12 and 24 months
  - LP and retreat if
    - **titer rises 4 fold**
    - **titer fails to fall 4 fold by 12-24 months**
    - **Signs or symptoms of late syphilis recur**

# Syphilis Management

- Neurosyphilis:
  - PCN G 18-24 mU IV/day for 10-14 days
  - Procaine 2.4 mU IM/day plus Probenecid 500 mg po QID for 10-24 days.
  - Lumbar Puncture is no longer required if the RPR titer is falling over the next 2 years and there is no progression of disease
- Cardiac or Gummatous syphilis
  - Benzathine PCN 2.4 mU IM q wk x 3

# Congenital Syphilis

- Pregnancy
  - Treat as appropriate for stage with penicillin
  - Giving a second dose for early syphilis is now for suggested as an option
  - Fetal Ultrasound and HIV test
  - Beware Jarisch-Herxheimer reaction during second half of pregnancy
  - Check repeat RPR at 28-32 week at a minimum
    - Consider checking monthly RPR if high risk for reinfection or high prevalence
  - Inadequate Treatment likely if:
    - Delivery occurs within 30 days of therapy
    - Clinical signs of infection are present at delivery
    - Maternal antibody titer at delivery is four-fold higher than pretreatment titer

# Congenital Syphilis Manifestations

- Placenta is large, thick and pale, Umbilical cord: "barber pole"
- Early
  - Hepatomegaly
  - Jaundice
  - Nasal discharge ("snuffles")
  - Maculopapular rash: two weeks after rhinitis, can be bullous, warty, fissured
  - Adenopathy
  - Skeletal abnormalities (saber shins)
  - Meningitis (mononuclear predominance, high protein, normal glucose)
  - Pneumonia Alba
  - Anemia

# Congenital Syphilis Manifestations

- Late
  - Frontal bossing
  - Saddle nose
  - Interstitial keratitis
  - Sensorineural hearing loss
  - Hutchinson teeth
  - Rhagades
  - Intellectual disability
  - Saber shins and Clutton joints (painless hydrarthrosis)
  - Paroxysmal cold hemoglobinuria

# Congenital Syphilis Manifestations

# Congenital Syphilis Evaluation

All neonates born to RPR and treponemal positive mothers require:

- RPR/VDRL testing of serum (not cord blood and not a treponemal test)
- Thorough physical exam
- Placental/Cord exam with silver staining or *T pallidum* PCR
- Skeletal survey if stillborn

# Congenital Syphilis Evaluation Scenarios

- Proven/highly probable (abnormal exam or RPR 4-fold higher than mom's or (+) darkfield:
  - CSF analysis for VDRL cell count and protein
  - CBC
  - CXR, long bone films, LFTs, brain imaging, ophthalmologic exam, ABSER
- Possible (Mother inadequately Rxd, Non-PCN Rx, Rx <4 weeks before delivery)
  - CSF analysis for VDRL cell count and protein
  - CBC
  - CXR, long bone films
- Less likely (normal exam, Rx appropriate and > 4 weeks before delivery
  - No evaluation required
- Unlikely (normal exam, Rx appropriate, titer equal to mother, mother longterm serofast 1:4)
  - No evaluation required

# Congenital Syphilis Treatment

- Proven/Highly Probable:
  - PCN G 50,000 units/kg/day every 12 hours for 7 days then every 8 hours for 10 days total.
  - Procaine PCN 50,000 units/kg/dose IM daily for 10 days
- Possible
  - PCN G 50,000 units/kg/day every 12 hours for 7 days then every 8 hours for 10 days total.
  - Procaine PCN 50,000 units/kg/dose IM daily for 10 days
- Less Likely:
  - Benzathine PCN G 50,000 units/kg/dose IM once
- Unlikely:
  - No Rx

# How to handle contacts

- Each index case needs a minimum of 2 interviews
- Named contacts need
  - Complete STI bundle testing
    - Syphilis EUA with reflex RPR same day as epi treatment
    - HIV serology
    - Gonorrhea (urine, throat, rectum)
    - Pregnancy test
    - Viral hepatitis test
  - Treatment
    - Benzathine PCN x 1 if less than 90 days → EPI TREATMENT
    - Benzazthine PCN x 1 if over 90 days if Syphilis test is positive or f/u not ensured

# Other Considerations for syphilis patients

- Offer HIV PrEP to every patient
- Offer Mpox JYNNEOS vaccine PrEP to every patient
  - Intradermal vaccine when supplies or limited, Sub Q if plentiful

# What is the role of the IHS PHN?

- Key role in ensuring that every single syphilis patients gets:
  - The correct diagnosis in the chart→ STAGING is EVERYTHING
  - The correct treatment for that diagnosis
  - The proper follow up testing and management

- Coordinate care with
  - STI clinicians
  - Tribal Disease Intervention Specialists (DIS) or STD technicians
  - County and State Departments of Health

# Tools an IHS PHN Can use during the outbreak

- Monthly meetings (minimally) with clinician, tribal and county DOH
- Daily contact by Phone and EHR with designated STI clinician for challenging cases
- Maintain an STI database
  - iCare to identify new cases
  - Excel file documenting patient demographics, tests, treatments, contact etc.

# Tools an IHS PHN Can use during the outbreak

- EHR alerts
  - Look at the annual syphilis reminder to see if syphilis testing is due
  - Use the EHR Syphilis pop-up function
    - Document the diagnosis and reason for the pop-up
      - Stage of Syphilis
      - Need for Treatment  recommended dose
      - Need for follow-up testing

# Tools an IHS PHN Can use during the outbreak

- Rapid Syphilis testing the field and clinic
  - *Chembio* DPP HIV Syphilis$_{TM}$
    - HIV/Syphilis combo test
    - Requires special gizmo for reading result
  - *Diagnostics Direct* Syphilis Health Check$_{TM}$
    - Syphilis test
    - No gizmo

# Tools an IHS PHN Can use during the outbreak

- Field PCN Injection
  - Safe to give at home, at a shelter or jail, on the streets
  - Directly Observed Therapy is always best
  - Good for
    - Persons experiencing homelessness
    - Persons who are incarcerated
    - Persons with transportation or adherence issues
    - Partners of cases
  - Make sure you have cell service before giving injection
  - Contact Melissa Wyaco or Tina Tah if you want to get started

# Where to learn more…

- CDC 2021 Treatment Guidelines
  - https://www.cdc.gov/std/treatment-guidelines/STI-Guidelines-2021.pdf
- CDC STI App/Wall Chart/quick reference:
  - https://www.cdc.gov/std/treatment-guidelines/provider-resources.htm#MobileApp
- National STI Curriculum (Free CNE)
  - https://www.std.uw.edu

# Special Thanks to

- Melissa Wyaco
- Tina Tah
- Loretta Christensen
- Gallup, NAIHS, and National PHN teams
- Navajo Nation, New Mexico and Arizona STI programs
- Sharlene Todicheeney, GIMC HIV Nurse Specialist

Stomp Out

Syphilis!!