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St. Louis
STI/HIV Prevention
Training Center

Disclosures

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Objectives

- Discuss the rising rates of Syphilis in the US.
- Describe management of syphilis with a focus on neurosyphilis
- Review some cases of recent presentations.

THE

STATE OF STIs IN THE UNITED STATES, 2022

CDC's 2022 STI Surveillance Report underscores that STIs must be a public health priority

1.6 million
CASES OF CHLAMYDIA
6.2% decrease since 2018

648,056
CASES OF GONORRHEA
11% increase since 2018

207,255
CASES OF SYPHILIS
80% increase since 2018

3,755
CASES OF SYPHILIS AMONG NEWBORNS
183% increase since 2018

LEARN MORE AT: www.cdc.gov/std/

Syphilis Is Soaring in the U.S.

Cases have risen by 80 percent since 2018, the C.D.C. reported.

HEALTH

The US hasn't seen syphilis numbers

NATIONAL

A drug shortage makes it harder to treat a surge in syphilis cases

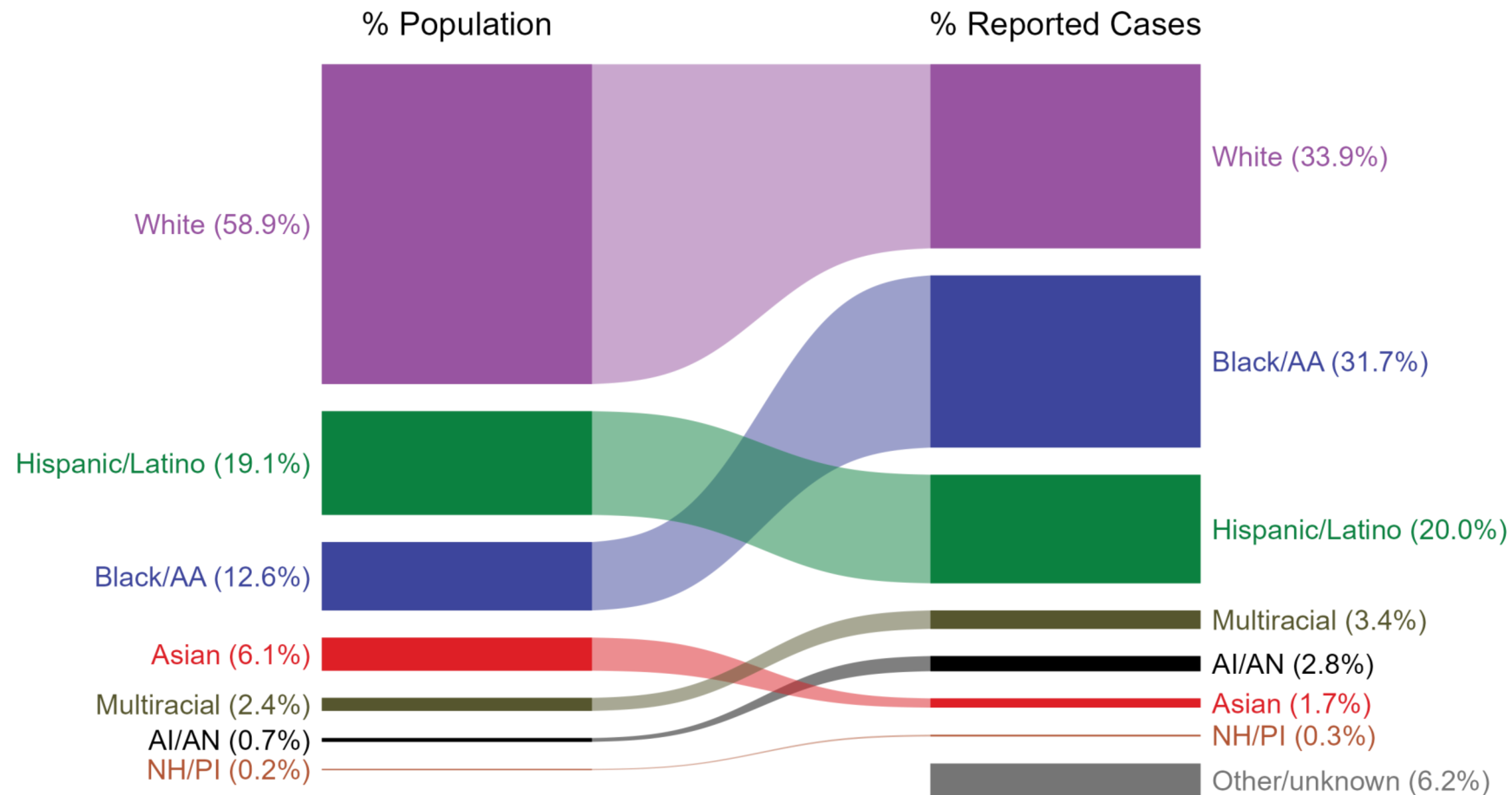
FEBRUARY 20, 2024 · 5:09 AM ET

FROM 90.3 wpln news

HEARD ON MORNING EDITION

By Catherine Sweeney

Primary and Secondary Syphilis — Total Population and Reported Cases by Race/Hispanic Ethnicity, United States, 2022

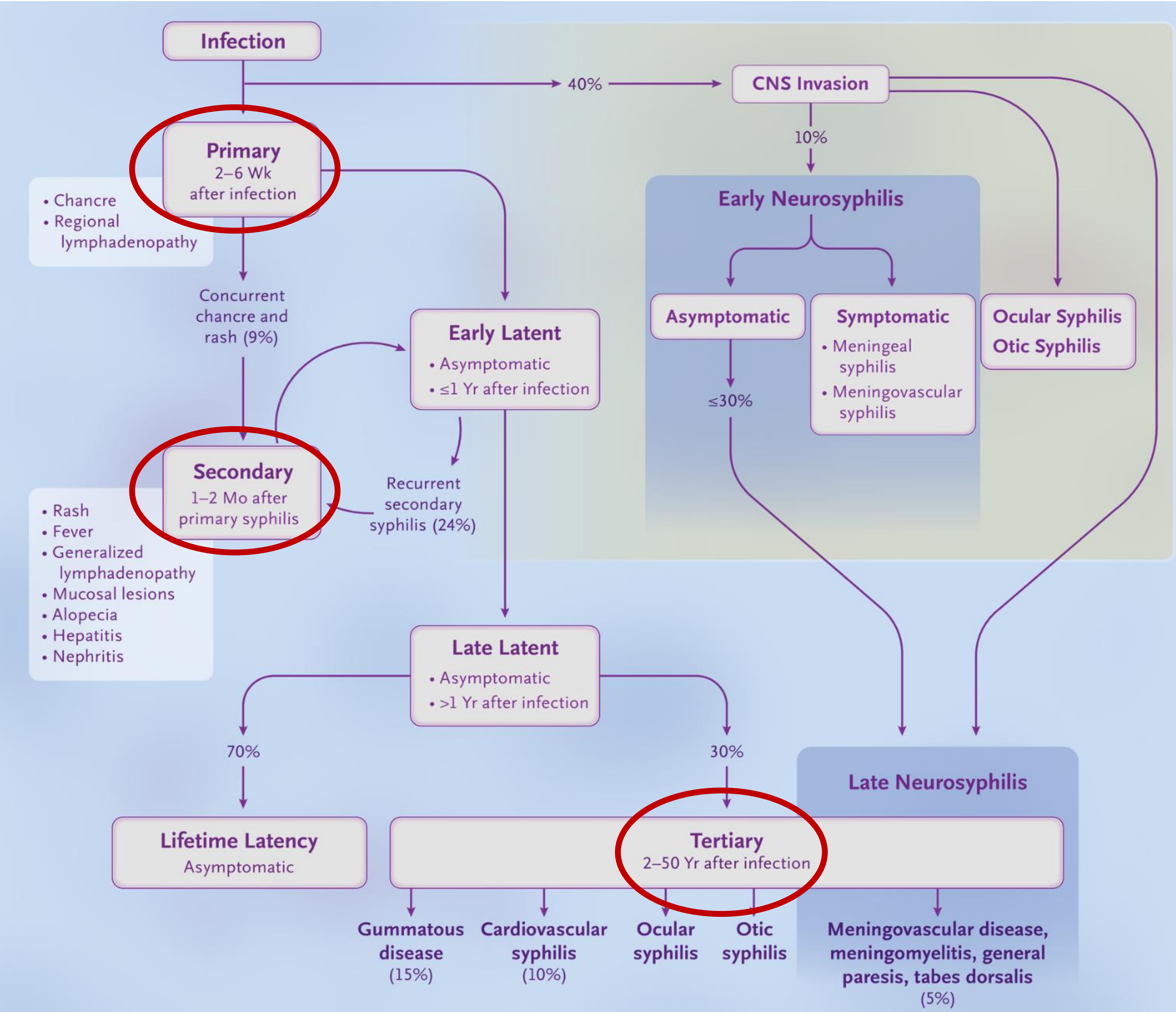


* Per 100,000

NOTE: In 2022, a total of 3,686 primary and secondary (P&S) syphilis cases (6.2%) had missing, unknown, or other race and were not reported to be of Hispanic ethnicity. These cases are included in the “other/unknown” category.

ACRONYMS: AI/AN = American Indian or Alaska Native; Black/AA = Black or African American; NH/PI = Native Hawaiian or other Pacific Islander

Ensure quality care



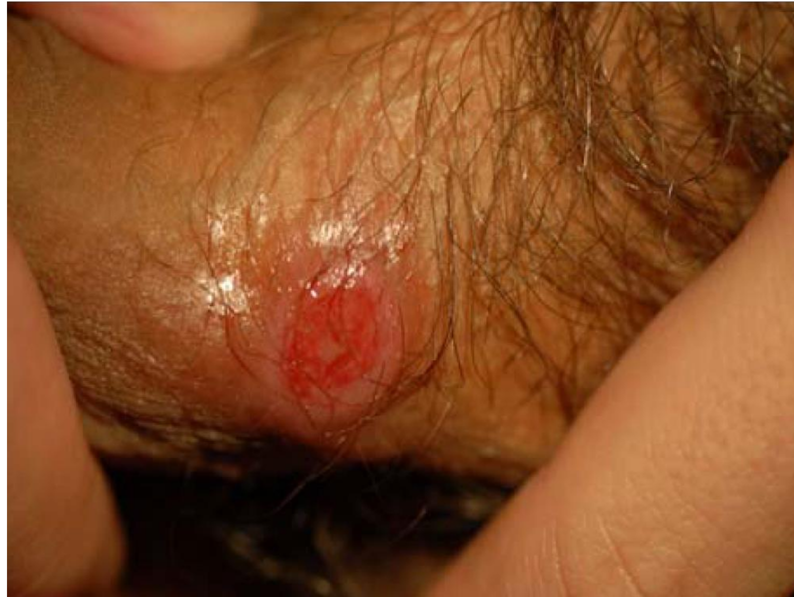
Stages of Syphilis

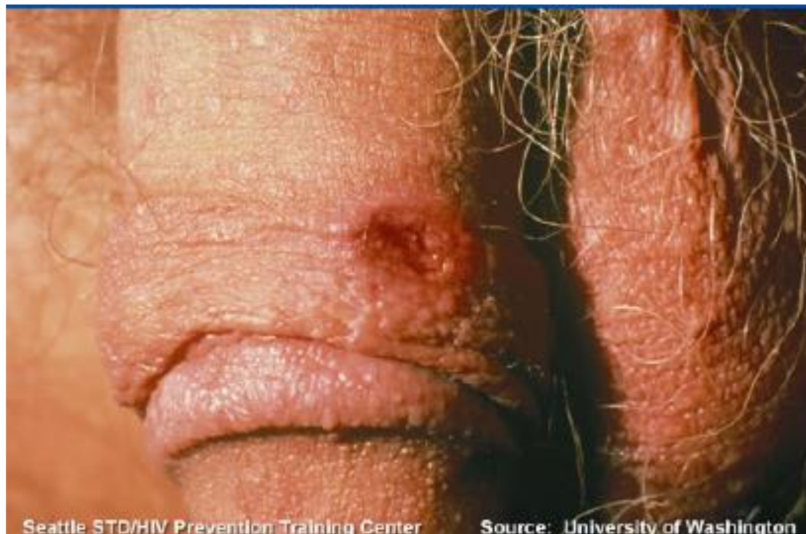
Challenges/ Key Points:

- Everyone with syphilis needs a neuro ROS and assessment for pregnancy.
- Ocular and otic syphilis can present at any stage of syphilis.
- Staging syphilis often depends on the patient's history of test results.
- Work with DIS/ health department to review patient's history
- Consult with DIS, ID, and colleagues to stage correctly.

Ghanem KG, Ram S, Rice PA. The Modern Epidemic of Syphilis. *N Engl J Med*. 2020;382(9):845-854. doi:10.1056/NEJMra1901593

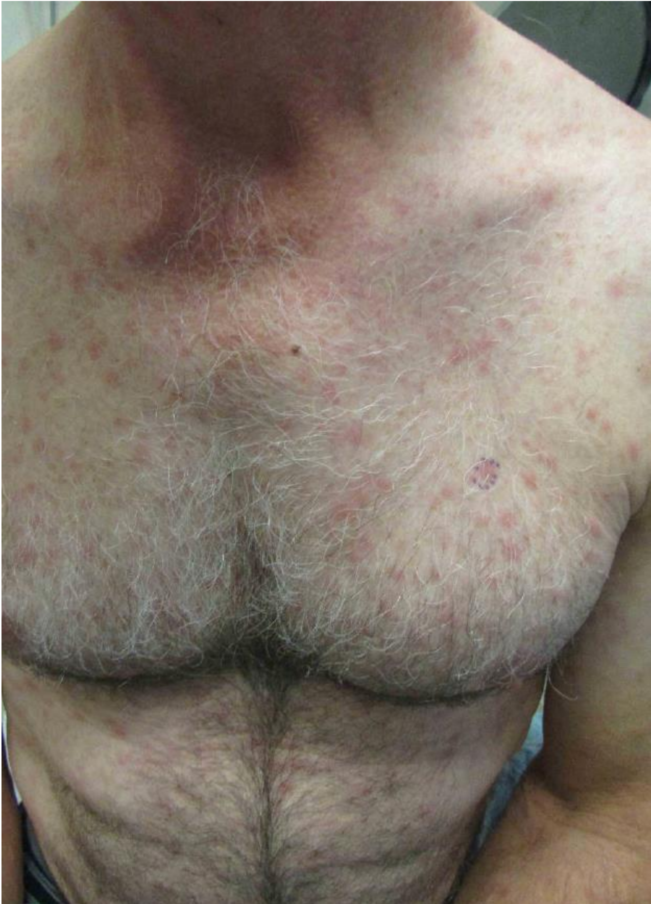
Primary Syphilis

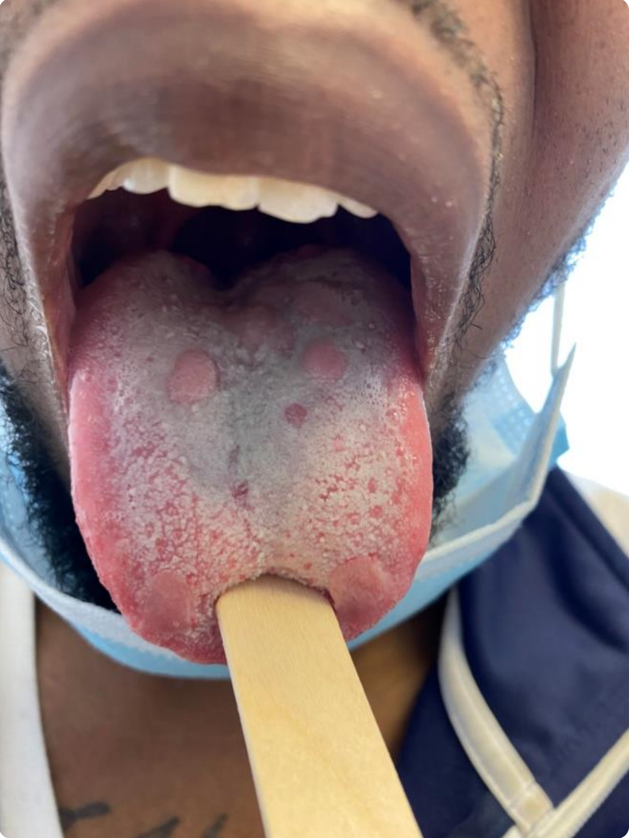


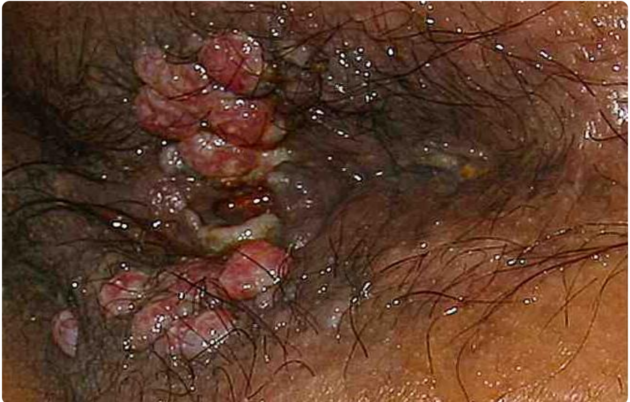


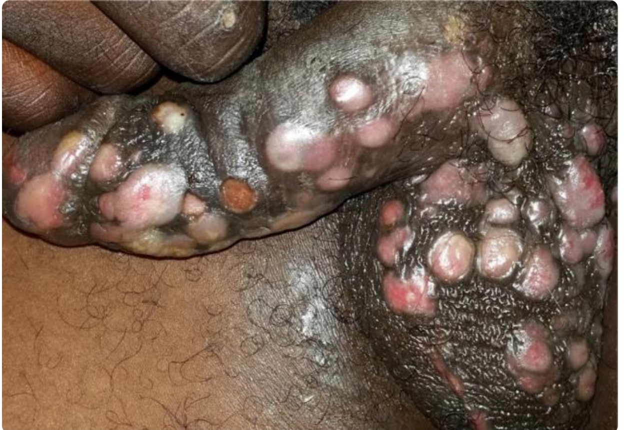
All images sourced from the National Network of Prevention Training Centers (NNPTC)

Secondary Syphilis



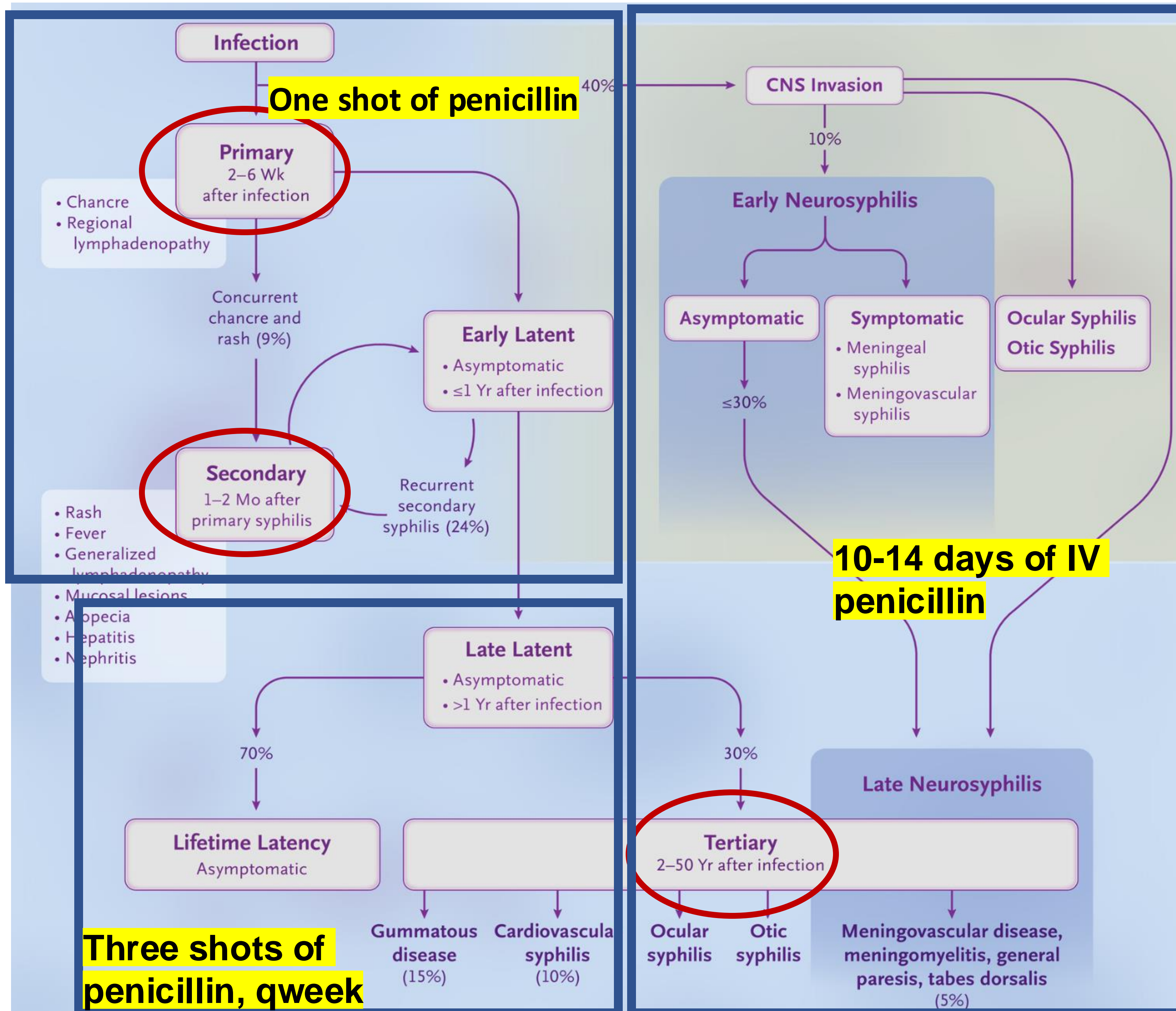






Neurosyphilis

- Can occur at any stage of infection
- Early Neurosyphilis
  - Occurs within first year of infection
  - Mostly in HIV-infected pts
  - Meningitis (HA, photophobia, CN palsies)
- Late Neurosyphilis
  - Occurs ~10 years after infection
  - Meningovascular
    - Endarteritis of CNS small vessels
    - CVA (MCA distribution) and seizures
  - Parechymatous
    - Destruction of nerve cells
    - Tabes Dorsalis, General Paresis (dementia, psychosis, AG pupil)



Treatment of Syphilis

Challenges/ Key Points:

- Benzathine penicillin shortages
- Who MUST be treated with bicillin?
  - Pregnant people
  - Alternatives for treating neurosyphilis have little evidence of efficacy.

*Dose= 2.4 million units benzathine penicillin IM

Ghanem KG, Ram S, Rice PA. The Modern Epidemic of Syphilis. *N Engl J Med*. 2020;382(9):845-854. doi:10.1056/NEJMra1901593

Congenital Syphilis

An example case

- Mom has adequate prenatal care with RPR NR at 8 wks gestation
- She presents with vaginal lesions at 35 weeks gestation
- HSV testing was negative.
- No other STI testing.
- Treated with valacyclovir.
- Presents in labor at 37 weeks.
- No RPR at delivery.
- Baby has work up at 5 months for slow weight gain and developmental delay.
- Hip xrays indicate periosteal abnormalities and CS is diagnosed.

Congenital Syphilis Prevention: Quality Care

- Decrease stigma for all STIs.
- Access to packaged STI testing for people of childbearing potential.
- Counseling pregnant people on STI prevention
- Implement Syndemic care plans

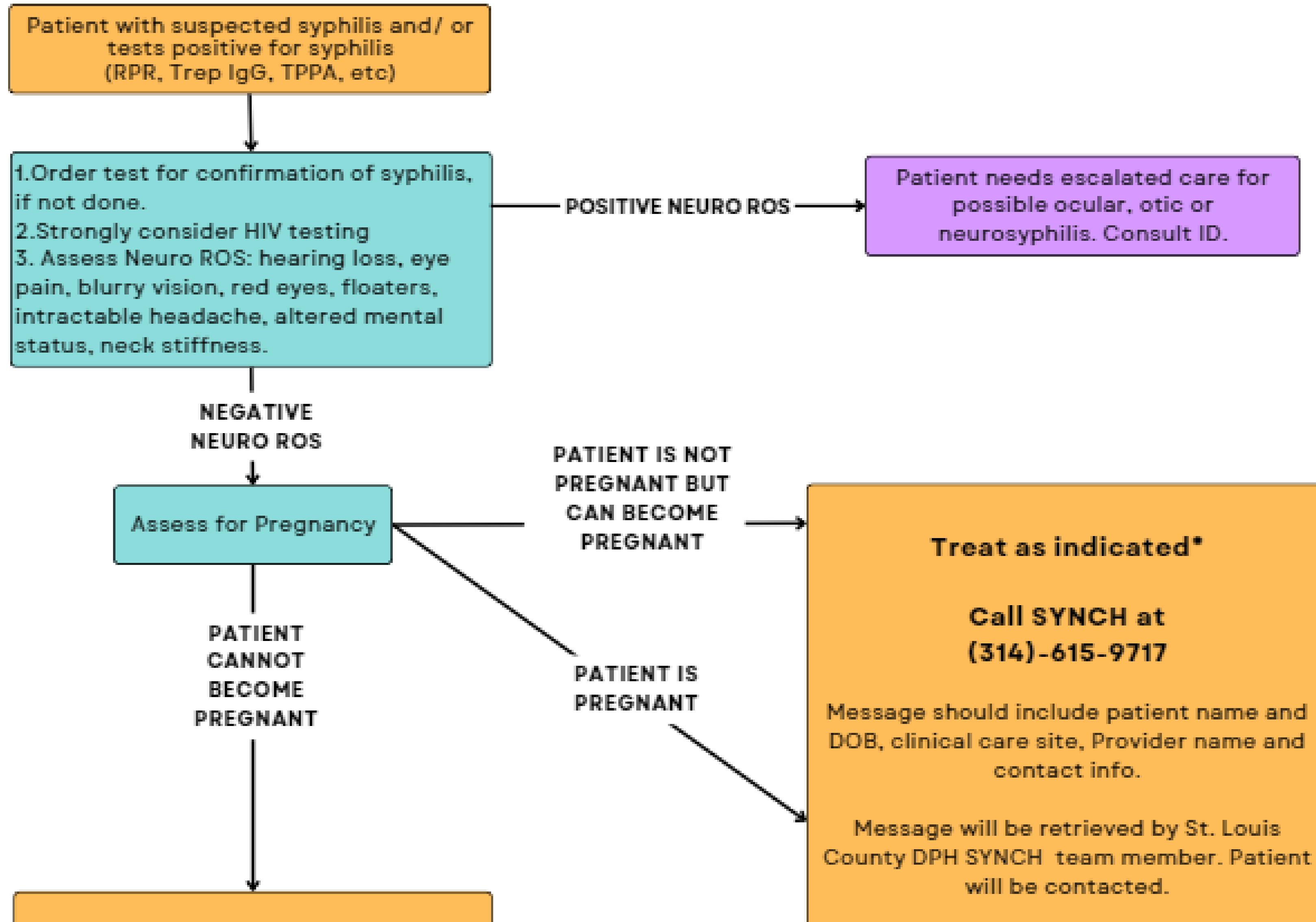
Syphilis Navigation Connection Hotline Program

Or the SYNCH Program

Lead: St. Louis County Department of Public Health

Funding: CDC, EtE grant

Learners from: MFM fellowship, Gephardt Institute



Reno, St Louis County DPH

Symptoms of Neurosyphilis

Early Meningeal (usually within 12 months of infection)
Headache, photophobia, manifestations of cranial nerve palsies

Late Meningovascular
Cerebral stroke: depends on location of thrombosis (e.g., hemiparesis)
Spinal cord involvement: depends on location/extent (e.g., weakness, urinary incontinence)

Late Parenchymatous: General paresis
Early: Irritability, memory loss, personality changes, insomnia Late: Impaired judgement, emotional lability

Late Parenchymatous: Tabes dorsalis
Ataxia, paresthesia, "lightning" pains (legs), "visceral crises" (episodic epigastric pain)

CNS Gummas
Variable symptoms depending on location of lesion

Ocular Syphilis
Vision loss, eye pain, floaters, flashing lights

Otic Syphilis
Hearing loss, dizziness, tinnitus, vertigo

Signs of Neurosyphilis

Early Meningeal
Meningismus, altered mental status, papilledema, cranial nerve abnormalities; more rarely aphasia, hemiplegia

Late Meningovascular
Brain: Various signs of CVA depending on location; if in Spinal cord: Muscle atrophy, leg weakness and spasticity, hyperreflexia

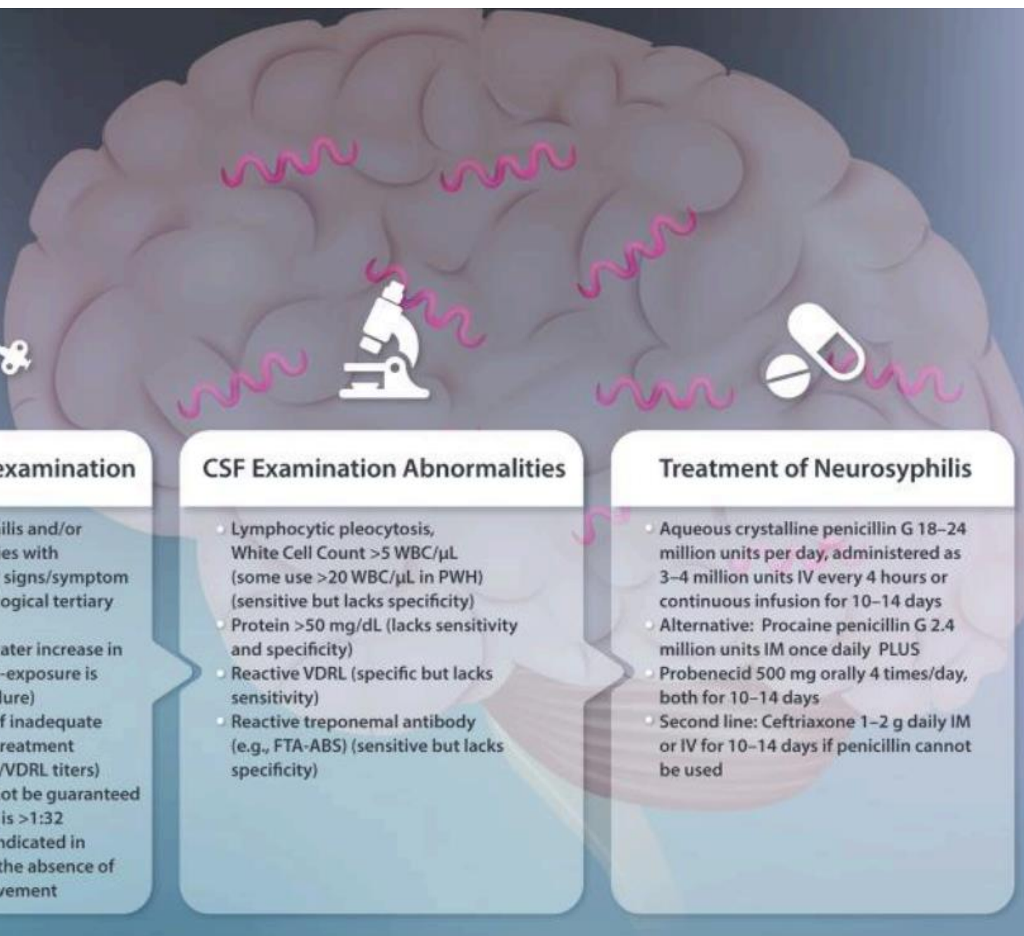
Late Parenchymatous: General paresis
Memory loss, disorientation, reflex abnormalities

Late Parenchymatous: Tabes dorsalis
Gait disturbances, diminished vibratory/position sense, absent deep tendon reflexes, positive Romberg, broad based or stomping gait, Charcot joints

CNS Gummas
Reflect space-occupying CNS lesion. Spinal cord: paraplegia, motor or sensory loss and urinary and fecal incontinence

Ocular Syphilis
Argyll Robertson pupil, decreased visual acuity, uveitis

Otic Syphilis
Gait instability, hearing loss



Indications for CSF examination

- Clinical evidence of syphilis and/or reactive syphilis serologies with compatible neurological signs/symptom
- Persons with non-neurological tertiary syphilis
- A sustained 4-fold or greater increase in RPR/VDRL titers when re-exposure is excluded (serological failure)
- Consider in the setting of inadequate serological response to treatment (<4-fold decrease in RPR/VDRL titers) if reliable follow up cannot be guaranteed or if post treatment titer is >1:32
- CSF examination is not indicated in ocular or otic syphilis in the absence of other neurological involvement

CSF Examination Abnormalities

- Lymphocytic pleocytosis, White Cell Count >5 WBC/µL (some use >20 WBC/µL in PWH) (sensitive but lacks specificity)
- Protein >50 mg/dL (lacks sensitivity and specificity)
- Reactive VDRL (specific but lacks sensitivity)
- Reactive treponemal antibody (e.g., FTA-ABS) (sensitive but lacks specificity)

Treatment of Neurosyphilis

- Aqueous crystalline penicillin G 18–24 million units per day, administered as 3–4 million units IV every 4 hours or continuous infusion for 10–14 days
- Alternative: Procaine penicillin G 2.4 million units IM once daily PLUS
- Probenecid 500 mg orally 4 times/day, both for 10–14 days
- Second line: Ceftriaxone 1–2 g daily IM or IV for 10–14 days if penicillin cannot be used

REMEMBER

Offer HIV testing and consider HIV PrEP in persons not infected with HIV who are diagnosed with syphilis

Hamill MM, Ghanem KG, Tuddenham S. Executive Summary: State-of-the-Art Review: Neurosyphilis. Clin Infect Dis. 2024 May 15;78(5):1085-1087

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Case #1

- 31 year old cis-gender male presents to STI clinic with ulcer on his penis and lymphadenopathy. He states the ulcer is painless, started 3 days ago, and he noticed swollen lymph nodes in his pelvic region. He also has developed ringing in his ears with his hearing loss which he describes as muffled hearing.

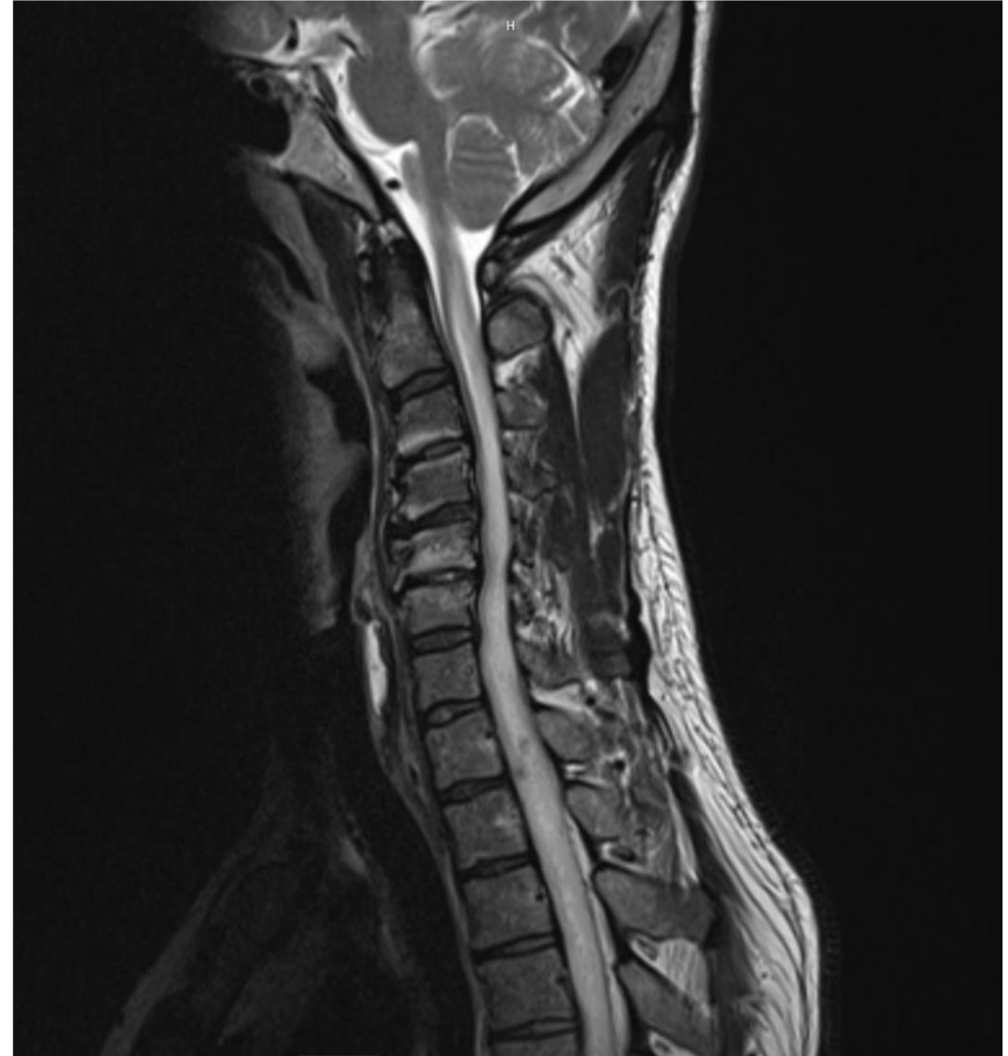
- What would you do next?

Case #2

- 48-year-old man with prior gunshot wound to the abdomen (30+ years ago) and anterior uveitis but otherwise healthy presents with lower extremity weakness and numbness.
- ~4 months prior to admission had woken up with numbness in his feet and fell after missing a step on stairs.
- He used a walker and felt his symptoms were improving so did not seek medical attention. However, over the following weeks/months he continued to have multiple falls.
- Within the past few weeks developed: loss of sensation in abdomen, difficulty urinating, and constipation.

Case #2

- He presents with the inability to walk.
- A neurologic examination was performed and showed absent strength in bilateral extremity muscles.
- Extensive T2 hyperintense cord signal abnormality extending from the medulla through T12 with scattered foci of T2 hypointensities at the level of T1/T2 , T5 and T7 concerning for foci of intramedullary hemorrhage.



Lab values

	Latest Reference Range & Units	
Color, CSF	Colorless	**Straw !**
Clarity, CSF	Clear	**Cloudy !**
Xanthochromia, CSF	Absent	**Present !**
Glucose, CSF	mg/dL	**40 (L)**
PROTEIN, TOTAL, CSF	5 - 45 mg/dL	**2060 (H)**
Nucleated cells, CSF	0 - 5 /cumm	**950 (H)**
RBC Count CSF	0 - 0 /cumm	0
Neutrophils, CSF	0 - 6 %	**43 (H)**
Lymphs, CSF	40 - 80 %	51
Monos, CSF	15 - 45 %	**5 (L)**
Macrophages, CSF	0 - 0 %	**1 (H)**

	Latest Reference Range & Units	
RPR	Nonreactive	**Reactive**
RPR, quant	Nonreactive	**1:256**
Treponemal IgG/IgM	Nonreactive	**Reactive**

	Latest Reference Range & Units	
VDRL CSF qn	Negative	**1:128**

Thanks

St. Louis
STI/HIV Prevention
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Public Health Data
and Training Center
INSTITUTE FOR PUBLIC HEALTH AT WASHINGTON UNIVERSITY

Team Reno