

Neuro, ocular, and otosyphilis

A guide for healthcare providers

Introduction

- Syphilis is a common sexually transmitted infection (STI) that develops in stages: primary, secondary, early latent, and late latent.
- Syphilis can invade the brain and central nervous system (neurosyphilis), eyes (ocular syphilis), and inner ear (otosyphilis) at **any stage of infection** and can cause permanent damage if not properly treated. This happens in only a small percentage of people infected with syphilis.
- This guide explains the symptoms of these conditions, guidance on diagnosis, as well as recommended and alternative treatment.

5% of Utahns diagnosed with syphilis in 2024 had neuro, ocular, or otosyphilis.

Symptoms

Neurosyphilis	Ocular syphilis	Otosyphilis
<ul style="list-style-type: none"> • Difficulty thinking or making decisions • Changes in personality • Severe headache • Stiff neck • Loss of vibration sense • Numbness in hands, feet, legs, or arms 	<ul style="list-style-type: none"> • Eye pain • Vision changes • Blurry vision • Vision loss • Seeing flashing lights or floaters 	<ul style="list-style-type: none"> • Hearing loss • Tinnitus • Vertigo

- It's important to ask all patients who have been diagnosed with syphilis if they have symptoms of neuro, ocular, or otic infection.
- Patients without symptoms of these conditions **do NOT** need further workup and can be treated with 1 to 3 weekly injections of penicillin ([see CDC guidelines](#)).

Diagnosis

- The diagnostic testing and exams needed for patients experiencing symptoms of neuro, ocular, or otosyphilis are summarized in the table below.
- Often, an emergency room (ER) visit is the quickest way for patients to receive diagnostic testing and specialized care for neurosyphilis. In some situations, this may also be true for ocular and otosyphilis.

Neurosyphilis	Ocular syphilis	Otosyphilis
<ul style="list-style-type: none"> • CSF-VDRL and CSF cell count. • Healthcare providers should treat patients right away if they have a high suspicion of neurosyphilis (even if CSF testing is unavailable). 	<ul style="list-style-type: none"> • A full eye exam by an ophthalmologist, as well as a cranial nerve exam. • Patients do not need CSF testing if they have a normal cranial nerve exam and no symptoms of neurosyphilis. 	<ul style="list-style-type: none"> • An exam by an ENT and a cranial nerve exam. • Patients do not need CSF testing if they have a normal cranial nerve exam and no symptoms of neurosyphilis.

Treatment

- Neuro, ocular, and otosyphilis can all be treated with the same medication and dose.

Recommended treatment: Aqueous crystalline penicillin G

Dose: 18 to 24 million units total each day, for 10 to 14 days.

- Continuous infusion OR
- 3 to 4 million units by IV every 4 hours.
- This treatment is often given inpatient. Some people can get treatment set up through an infusion clinic, or through home health.
- Those with late latent syphilis should also get 2.4 mu of IM benzathine penicillin when they finish IV treatment.

Barriers to care

- An ER visit is often the quickest way to access diagnostic testing and start treatment for neurosyphilis (and sometimes ocular and otosyphilis as well).
- However, people may have barriers to receiving care in an ER or staying inpatient for up to 14 days. For example, people who:
 - Do not have health insurance
 - Have substance use disorder
- Outpatient IV treatment may be an option, but this is not always a good choice, like when a patient is unsheltered. Cost can also be a major barrier to outpatient IV treatment.

In 2024, 30% of people with symptoms of neuro, ocular, or otosyphilis did not get the recommended exams or treatment for their condition.

Alternative treatment

- Healthcare providers should treat patients diagnosed with neuro, ocular, and otosyphilis with the recommended IV penicillin treatment whenever possible.
- However, when patients can't access the recommended treatment, IM ceftriaxone is an option. There are fewer barriers to accessing this treatment as it can be quickly given in a clinic (or even an outreach setting), once a day.
- The downside of treating neuro, ocular, and otosyphilis with ceftriaxone is that there is limited data showing its effectiveness (see references).

Alternative treatment: Ceftriaxone*

Dose: 1 to 2 grams IM, daily for 10 to 14 days.

*This treatment should **only** be used for patients who can't get the recommended IV penicillin treatment.

The Utah Department of Health and Human Services' STI program can help patients and providers find a place to access ceftriaxone treatment. Call 801-538-6191 for assistance.

References

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