Sex, Sores, Science, and Surveillance: Syphilis in the 21st Century (U046)

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Conflict of Interest Disclosure

• No conflicts
Syphilis in the 21st Century

• Epidemiology of syphilis in the United States
• Reverse-sequence serologic testing algorithm
• Syphilis screening recommendations
• Management recommendations
Epidemiology of syphilis in the USA
Syphilis — Rates of Reported Cases by Stage of Infection, United States, 1941–2016

Rate (per 100,000 population)

- Primary and Secondary
- Early Latent
- Total Syphilis

Year


NOTE: Data collection for syphilis began in 1941; however, syphilis became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://www.cdc.gov/nndss/conditions/syphilis/.

https://www.cdc.gov/std/stats16/slides.htm
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Syphilis in the United States: on the rise?

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- Effective HIV treatment
- Decreased fear of HIV
- PrEP for HIV prevention
- Internet and hook-up apps
- Meth and other drug use

• Methamphetamine use: 19%
• Use of Internet to meet sex partner(s): 36%
• Meth and Internet users had more sex partners than non-users

Primary and Secondary Syphilis — Rates of Reported Cases by Race/Ethnicity, United States, 2012–2016

Rate (per 100,000 population)

- AI/AN*
- Asians
- Blacks
- Hispanics
- NHOPI*
- Whites
- Multirace

Year


* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.


https://www.cdc.gov/std/stats16/slides/SurvRpt-2016-All-Slides-wnotes.pdf
Primary and Secondary Syphilis — Rates of Reported Cases by State, United States and Outlying Areas, 2016

NOTE: The total rate of reported cases of primary and secondary syphilis for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 8.7 per 100,000 population.

https://www.cdc.gov/std/stats16/slides.htm

- 4 cases in men who have sex with men
- All with visual symptoms
  - Vision loss, flashing lights, blurry vision → uveitis
  - No other symptoms or signs of syphilis
• 388 cases (0.6% of total syphilis cases)
• 69% MSM
• 51% living with HIV
• 28% with primary or secondary syphilis
• 22% had other neurosyphilis symptoms
• Symptoms: blurry vision (64%), vision loss (33%), eye pain or red eye (14%)

https://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6543a2.pdf
Clinical Advisory: Ocular Syphilis in the United States

What to do?

- Patient without ocular symptoms: neuro exam including all cranial nerves
- Patient with ocular symptoms: ophtho evaluation and lumbar puncture
- Treat ocular syphilis according to neurosyphilis guidelines
- Report ocular syphilis cases to health department

Neurosyphilis/Ocular Syphilis: ROS and Focused Neuro Exam

Early Neurosyphilis: Review of Systems (pertinent positive symptoms)

GENERAL/CONSTITUTIONAL: headache, fever, fatigue, weakness, dizziness

HEAD, EYES, EARS, NOSE AND THROAT:
- Eyes: pain, redness, loss of vision, double or blurred vision, photophobia, flashing lights or spots
- Ears: ringing in the ears, loss of hearing

GASTROINTESTINAL: nausea, vomiting

MUSCULOSKELETAL: neck pain/stiffness, muscle weakness

NEUROLOGIC: headache, dizziness, muscle weakness, confusion, loss of consciousness, seizures, difficulty speaking

PSYCHIATRIC: confusion

Early Neurosyphilis: Focused Neurologic Exam

- Cranial Nerve Exam: assess for cranial nerve palsies (key maneuvers in bold)
  - II: visual acuity, visual fields
  - III, IV, VI: pupillary reactions to light and accommodation
  - III, IV, VI: extraocular movements, inspect for ptosis
  - V: corneal reflexes and jaw strength/movements, facial sensation
  - VII: facial movements (raise eyebrows, frown, tightly close eyes, show teeth smile, puff out both cheeks)
  - VIII: hearing (rub fingers together)
  - IX: swallowing, gag reflex, rise of palate
  - V, VII, X, XII: voice and speech
  - XI: trapezius muscle inspection & shoulder shrug
  - XII: inspection of tongue and lateral movement of tongue while protruded

- Motor: assess for weakness/hemiplegia
  - Muscle strength testing upper and lower extremities

- Nuchal Rigidity Testing: assess for meningeal inflammation
  - Chin to chest: stiffness/pain with flexion of neck, flexion of hips and knees in response to neck flexion (Brudzinski’s sign)
  - Jolt accentuation maneuver - worsening of headache when patient rotates head rapidly from side to side

- Deep Tendon Reflexes: assess for hyperreflexia
  - Biceps
  - Supinator
  - Knee
  - Ankle

CSF Examination for Neurosyphilis

• Indications according to CDC guidelines
  – Neurologic, otologic, or ophthalmic signs or symptoms
  – Suspected treatment failure
  – Evidence of active tertiary syphilis

• Does not depend on HIV infection status or on titer

Syphilis and HIV Co-Infection

• HIV among persons with syphilis in USA, 2016
  • Men who have sex with men: 47%
  • Men who have sex with women: 11%
  • Women: 4%

• Persons with syphilis not known to be HIV+ should be tested for HIV
• Consider HIV antibody test, also HIV viral load test
• Consider retesting if HIV test is negative

https://www.cdc.gov/std/stats16/syphilis.htm
Congenital Syphilis — Reported Cases by Year of Birth and Rates of Reported Cases of Primary and Secondary Syphilis Among Women, United States, 2007–2016

* CS = Congenital syphilis; P&S = Primary and secondary syphilis.
Late or limited prenatal care
Failure of healthcare providers to adhere to syphilis screening recommendations
Reverse-sequence serologic testing algorithm
“Reverse-sequence” serologic testing

• Treponemal before nontreponemal tests
• New treponemal tests
  – Enzyme immunoassay (EIA)
  – Chemiluminescent immunoassay (CLIA)
Traditional Algorithm

Nonreactive

No syphilis, prozone, other false negative

Reactive

TPPA or other treponemal test

Nonreactive

Biologic false positive

Reactive

Syphilis (new or previously treated)

Note: Algorithms are slightly simplified

“Reverse-sequence” algorithm

Reactive

TPPA or other treponemal test

Nonreactive

No syphilis, prozone, other false negative

Reactive

EIA/CLIA (treponemal)

Nonreactive

RPR or VDRL (nontreponemal)

Reactive

Syphilis (new or previously treated)

Nonreactive

Previously treated, new, prozone, or false positive EIA/CLIA?

Reactive

Syphilis (new or previously treated)

Clinical judgment + tiebreaker tests (non-EIA/CLIA treponemal tests)
Syphilis screening recommendations

http://www.actoronto.org/
# Syphilis screening recommendations: CDC and USPSTF

<table>
<thead>
<tr>
<th>Agency</th>
<th>Group</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC</td>
<td>Pregnant women</td>
<td>First prenatal visit and retest early in third trimester and at delivery if at high risk</td>
</tr>
<tr>
<td></td>
<td>MSM</td>
<td>At least annually, every 3–6 months if at increased risk</td>
</tr>
<tr>
<td></td>
<td>Persons with HIV</td>
<td>Sexually active: screen at first HIV evaluation and at least annually thereafter. More frequent screening depending on risk behaviors and local epidemiology</td>
</tr>
<tr>
<td>USPSTF</td>
<td>Pregnant women</td>
<td>All at first prenatal visit. For women in high-risk groups, many organizations recommend repeat serologic testing in the third trimester and at delivery.</td>
</tr>
<tr>
<td></td>
<td>Nonpregnant persons at increased risk</td>
<td>MSM and persons with HIV; other risk factors include incarceration or commercial sex work, geography, race/ethnicity, and being a male younger than 29 years. Optimal frequency not well established; every 3 months more effective than annually</td>
</tr>
</tbody>
</table>

WHAT'S TRENDS IN 
#VANCOUVER?

RAINBOW CROSSWALK

DATING APPS

GETTING TESTED FOR SYPHILIS

SYPHILIS RATES ARE AT A 30 YEAR HIGH

GET TESTED TODAY.

www.checkhimout.ca/syphilis

Management recommendations

Treatment of primary, secondary, and early latent syphilis without neurosyphilis in adults

- Benzathine penicillin G 2.4 million units intramuscular, single dose
- Penicillin-allergic patients
  - Non-Pregnant: Doxycycline 100 mg orally twice per day for 14 days
  - Pregnant: Desensitize, treat with benzathine penicillin G 2.4 MU IM once
- Jarisch-Herxheimer reaction (high-titer cases)
- Treatment of other stages/children/neurosyphilis
  - See CDC Guidelines

Other Management Pearls

- Report case to local or state health authority
  - Provider AND laboratory are BOTH required to report in all states
- Inform patient that public health workers might follow up
- Address other sexual health needs
  - HIV/STD testing, vaccinations, pre- and post-exposure prophylaxis for HIV
- Assess clinical response
  - No sex until clinically resolved
- Assess serologic response
  - Four-fold decline in nontreponemal test titer (RPR/VDRL) (e.g., $1:64 \rightarrow 1:16$)
  - Need day-of-treatment titer

http://cdc.gov/STD/treatment/2010/genital-ulcers.htm#syphilis
## Follow-up: CDC recommendations

<table>
<thead>
<tr>
<th>Stage</th>
<th>HIV Status</th>
<th>Follow-up after treatment</th>
<th>Typical timeframe for 4-fold titer decline</th>
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<td>HIV-uninfected</td>
<td>6 and 12 months</td>
<td>6–12 months</td>
</tr>
<tr>
<td></td>
<td>HIV-infected</td>
<td>3, 6, 9, 12, 24 months</td>
<td>6–12 months</td>
</tr>
<tr>
<td>Latent</td>
<td>HIV-uninfected</td>
<td>6, 12, 24 months</td>
<td>12–24 months</td>
</tr>
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<td></td>
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<td>6, 12, 18, 24 months</td>
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## Follow-up: a practical approach

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Contagious manifestations of syphilis — caveat physician!

- **Primary syphilis**
  - Chancre
- **Secondary syphilis**
  - Mucous patch (including split papule)
  - Condyloma lata