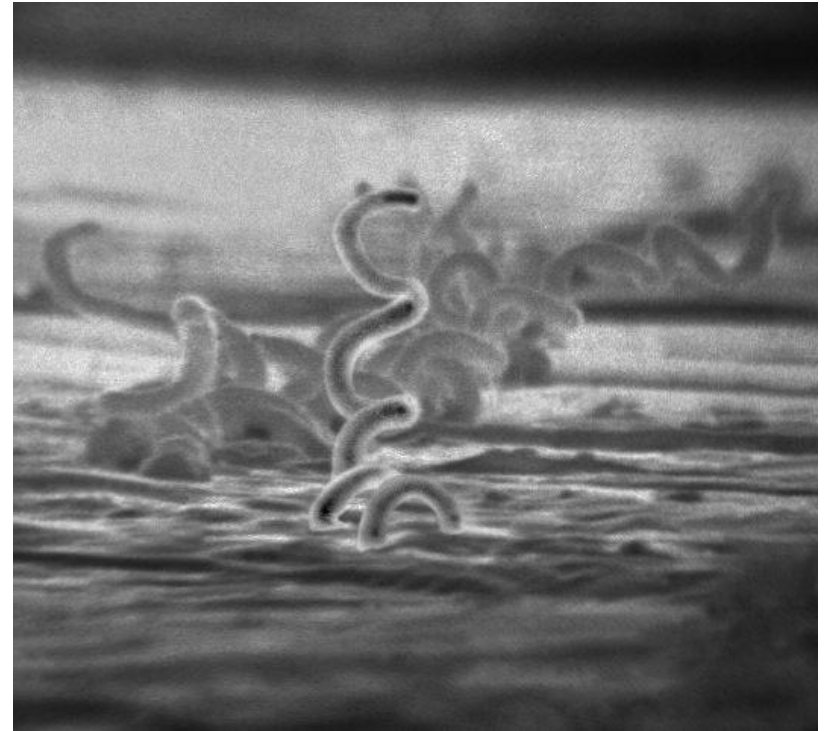


Considerations for Syphilis Rapid Point of Care Testing (POCT) for NSCSS Task Force

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Screening, Prevention and
Diagnosis Subcommittee

February 15, 2024



Electron micrograph of *Treponema pallidum*

Agenda

1. High-level Overview of Diagnosing and Lab-Based Testing
2. Rapid POC syphilis tests, and advantages and challenges
3. Considerations of POC syphilis tests
4. Where implementation might be useful

High-level Overview of Diagnosing Syphilis: Recognizing Symptoms, Testing, Knowing Prior Medical and Sexual History Are Key Components

1. If syphilis signs/symptoms present, then test and treat same day
2. If no signs/symptoms, diagnosis is less straight forward
 - Ask about sexual history and exposures
 - Order treponemal and nontreponemal lab-based blood tests to detect asymptomatic infection, **results not available same day**
3. If results reactive or positive, review syphilis lab and treatment history to determine *new or previously treated*
4. Scheduling patient to return for treatment

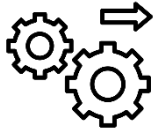
What if we had tests results the same day?

- **Point-of-care testing (POCT) refers to a rapid test that can be performed close enough to patient care that results can be acted on during the same visit**
- **Two POCTs for syphilis approved for use in the U.S.**
- **Advantages include:**
- **Finger prick is easier to collect than venous blood draw**
 - Fast results (10-15 minutes)
 - Patients could be treated at same time as test

Background – Syphilis Health Check™ (SHC)

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First FDA approved POC syphilis test



Detects treponemal antibodies only



10 minutes (Result valid for 5 min)



30-month shelf life



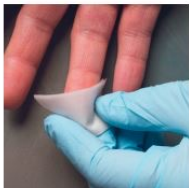
\$200/kit (\$10/test), \$29/controls



Syphilis Health Check™ (SHC)

Step 1: Collect specimen

A. Wipe finger with alcohol pad.



B. Prick finger using sterile lancet.



C. Remove first drop of blood.



D. Collect blood using pipette.



DO NOT SQUEEZE BULB ON PIPETTE!

Allow the blood to flow into the pipette on its own.

"Milk" finger.

Hold pipette horizontally, touch tip to sample.

Step 2: Run the test

A. Add blood to sample well by squeezing bulb on pipette.



*Well will turn red.
Allow blood to be absorbed.*

B. Slowly add four (4) drops of diluent to the sample well.

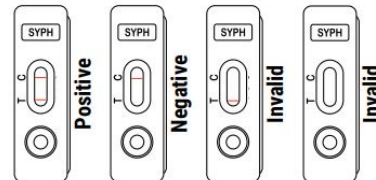


C. Set timer for 10 minutes.

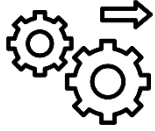


D. Read results no sooner than 10 minutes, and **no later than 15 minutes.**

Any line in the 'T' zone, even if faint, accompanied by a line in the 'C' zone should be interpreted as a positive result.



Background – Chembio DPP® HIV/Syphilis



Detects treponemal antibodies



**15 minutes to results
(Result valid for 15 min)**



24-month shelf life



**\$286/kit, \$75/controls,
\$499/microreader (good for 3000 tests)**

Controlled by 21049099.c1



Some reasons POCT are NOT used all the time

Current point-of-care tests only include *treponemal results*

- When positive, indicate syphilitic infection at some point, which may or may not indicate new infection

Nontreponemal tests, including titers, are needed for disease management and can be used to distinguish new/prior infection

- Not currently available as rapid test
- If POCT positive, need nontreponemal test

Persons previously treated for syphilis should not be screened using current POC tests

- Treponemal results typically stay positive, even after treatment

Test performance of POCT are lower in field studies than lab-based

High **sensitivity** = results positive when disease present

- **Lower sensitivity means more people who DO have syphilis will test negative → missed opportunities to treat (higher false-negative)**

High **specificity** = results negative when NO disease present

- **Lower specificity means more people who do NOT have syphilis will test positive → leads to overtreatment (higher false-positive)**

Syphilis Testing Sensitivity and Specificity

Test Name and Type	Testing Site	Sensitivity %	Specificity %	Time to Results and Specimen
Chembio HIV/Syphilis HIV, Syphilis Treponemal	In field	About 90%* (range: 85-100)	96%*	Rapid (15-minute fingerstick or venous whole blood)
Syphilis Health Check™ Syphilis Treponemal	In field	96% (range: 77-100)	97%	Rapid (10-minute fingerstick whole blood)
TPPA, EIA Treponemal Tests	In lab	99%**	99%	Several days
RPR, VDRL Nontreponemal Tests	In lab	About 94%^	99%	Several days

Performance estimates and ranges based on unpublished CDC metanalysis from limited published data. See references in slide notes.

*Insufficient data for true point estimate for sensitivity, range is included. Specificity point estimate from 1 study

**For syphilis primary stage, sensitivity ranges between 90%-95%; for secondary and latent stages, 100% sensitivity

^For primary stage, sensitivity ranges between 75%-85%; for secondary and latent stages, sensitivity ranges 95%-100%

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RECAP of Challenges and Benefits

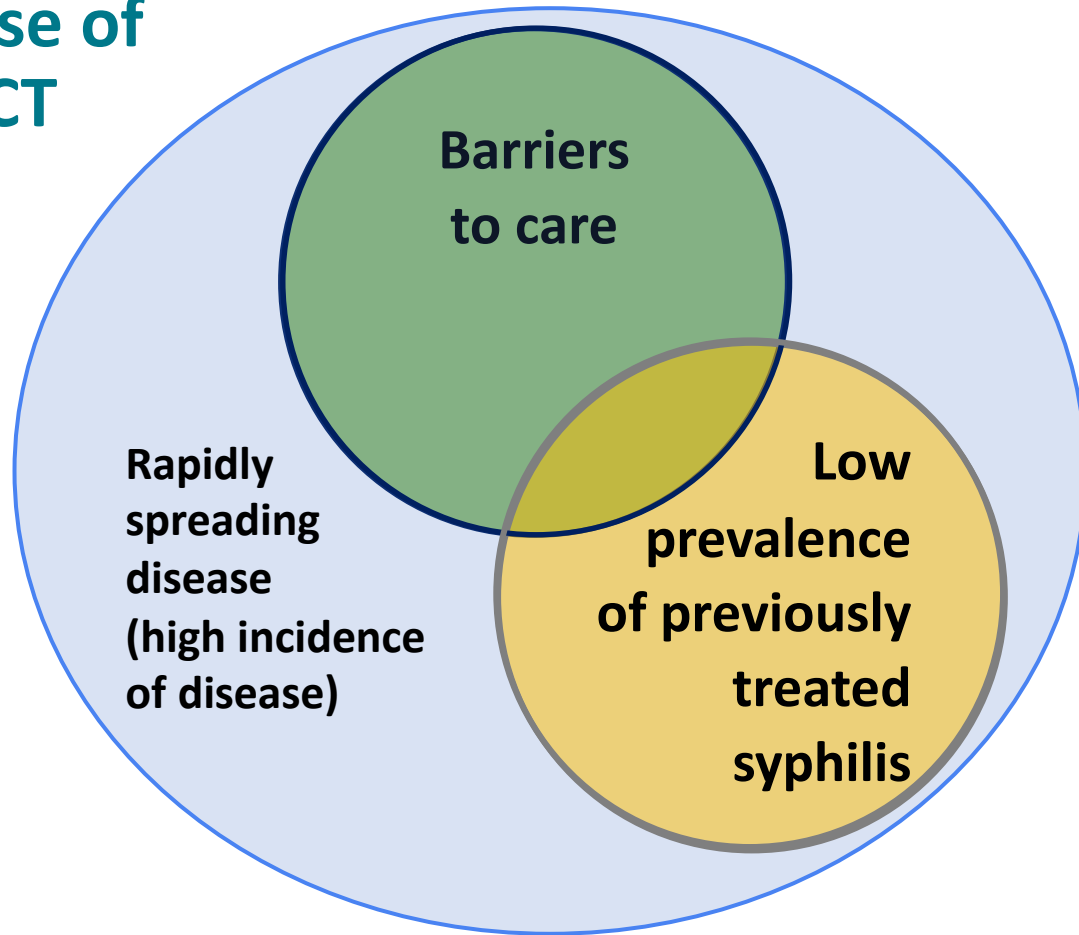
Challenges

- Could lead to missed diagnosis and overtreatment
- Only treponemal tests
- Cannot be used in those with previously history of syphilis

Advantages

- Quick results
- Easier test
- Could treat same day and reduce loss to follow-up

Where to Use of Syphilis POCT



Implement POCT where syphilis is spreading quickly (high incidence of new syphilis infections)

	In population with true prevalence of 1% , if 1,000 people tested	In population with true prevalence of 5% , if 1,000 people tested	In population with true prevalence of 7.5% , if 1000 people were tested
SHC Assume sensitivity 96% and specificity 97%	9 Infections detected 1 Missed infection 30 Overtreatment	48 Infections detected 2 Missed infections 29 Overtreatment	72 Infections detected 3 Missed infections 28 Overtreatment
Chembio DPP Assuming sensitivity 90% and specif. 96%	9 Infections detected 1 Missed infection 40 Overtreatment	45 Infections detected 5 Missed infections 38 Overtreatment	67 Infections detected 8 Missed infections 37 Overtreatment

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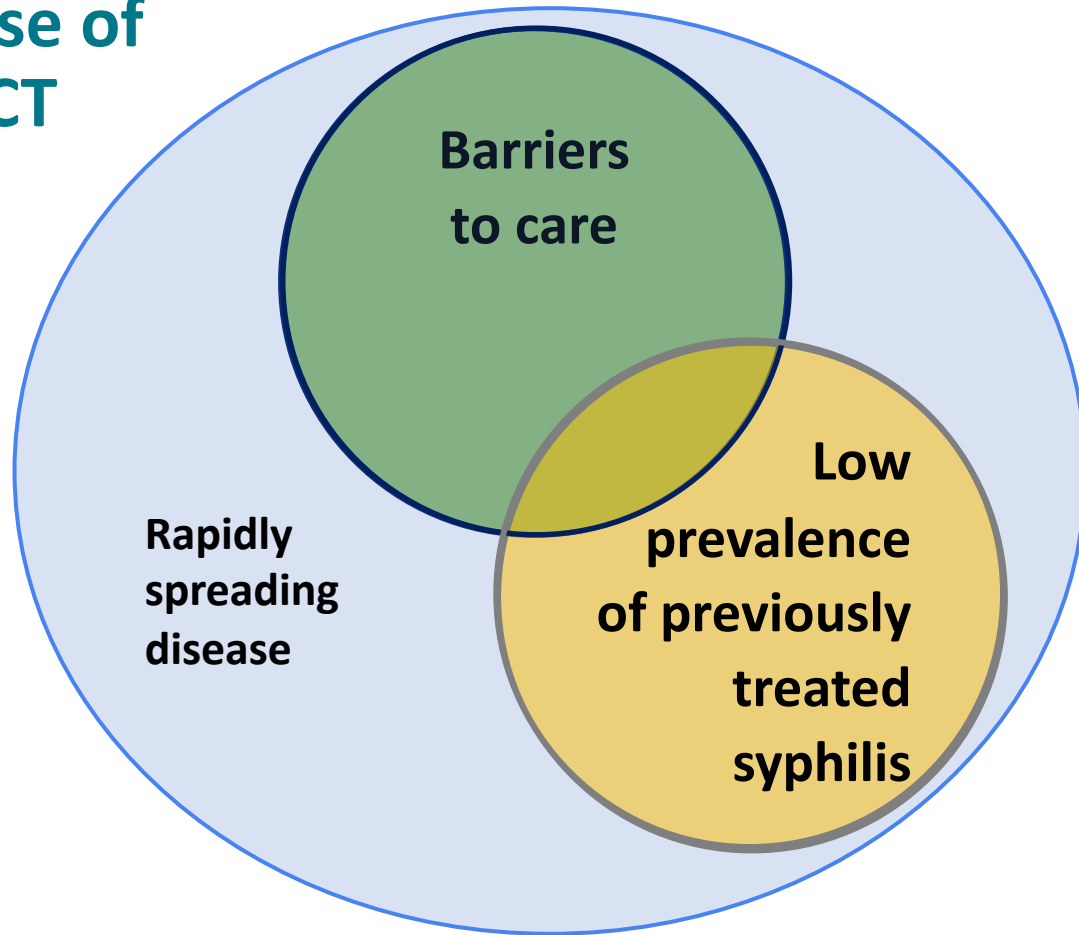
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With little increase in missed infections and overtreatment

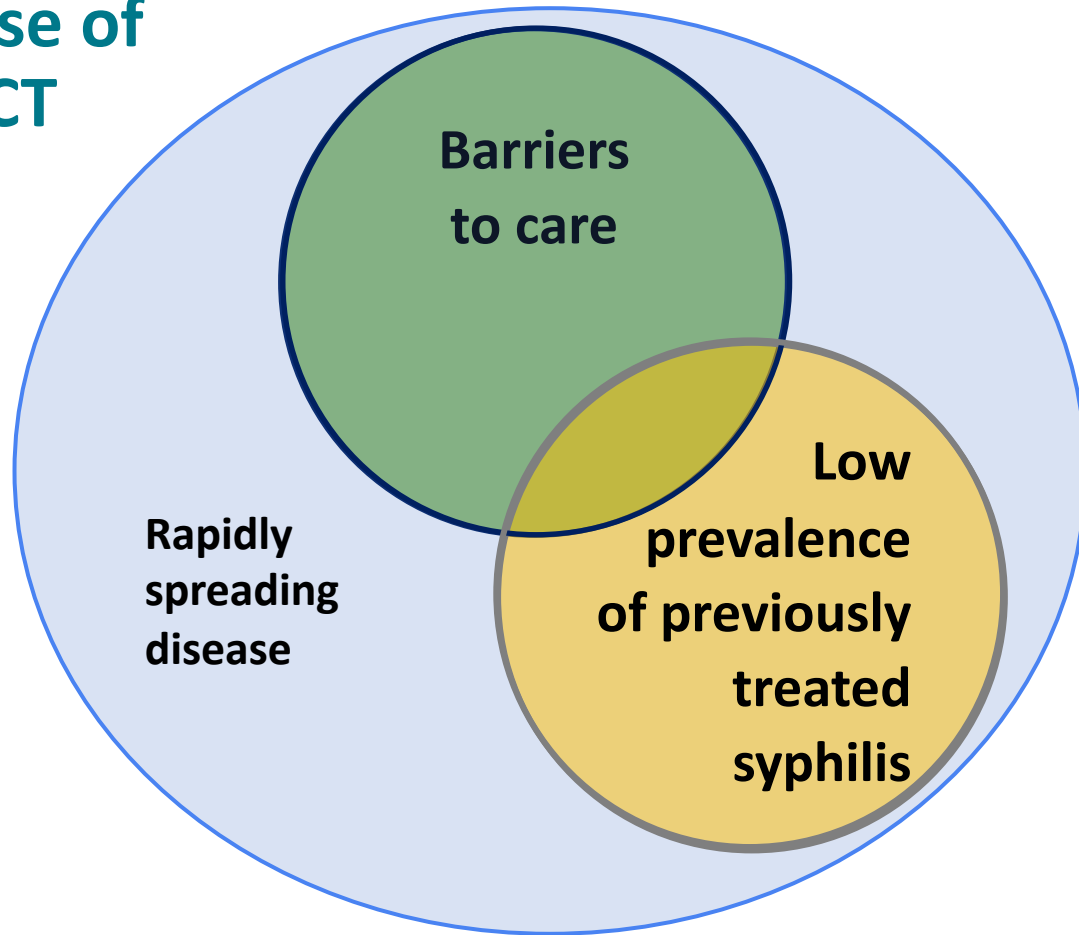
Where to Use of Syphilis POCT



Reaching populations with low prevalence of previous syphilis and screen for prior syphilis treatment

- In general, cisgender women are less likely to have recurrent syphilis infections
- Some populations with current high incidence of syphilis and low prevalence of prior syphilis include
 - Persons identifying as American Indian or Alaska Native, particularly women
 - Black and Latino heterosexuals, particularly women
- **Ask about prior syphilis treatment before testing**

Where to Use of Syphilis POCT



Places where rapid results would be useful

- **Substance use care and harm reduction sites**
 - Many are tested for HIV, can syphilis POCT be added?
- **Jails, especially if short incarceration time expected**
 - Treat before release
- **Shelters**
 - High turn-over and often vulnerable population

Where else rapid results would be useful ...

- **ED and urgent care visits for rapid results**
 - Overcome barrier and hesitancy to test related to difficulty following-up if results return positive after someone is discharged
 - Especially if other STI suspected
 - Seeking pregnancy testing
- **Rural areas where long distances delay return for care**

Clinical Considerations of Positive POCT

- **Ask about symptoms and sexual history to determine syphilis stage and length of infection and treatment course**
 - If possible, physical exam for signs
 - Screen for neuro-, oto-, and ocular syphilis
- **Counseling that positive POCT could be false-positive or past syphilis infection**
- **Needs lab-based testing and follow-up**
 - Nontreponemal and treponemal are essential for disease management
- **When possible, same day treatment based on length of infection**
- **For anyone with reproductive capacity, offer pregnancy testing**

What else would support implementation ...

- Overcome barriers to providing immediate treatment, especially if testing done in the field
- Hotline or warm line to review syphilis history and determine if treatment needed
- Increase HCP comfort with presumptive treatment
- Training and education (laboratorians, physicians, partners, public health staff, community)

Caveats to POCTs...

- POCTs can complement lab-based testing
 - Will require confirmatory lab-based testing
- Coupling immediate treatment with test will be important
- CLIA waiver can delay implementation
- Needs a quality assurance plan to maximize test performance
- Collaboration with health department and other partners to implement

POCT can...

- Expand access to care and meet people where they are
- Detect asymptomatic infections rapidly
- Create opportunity to immediately treat
- Be a tool to eliminate syphilis

**Thank you for your
time and attention!**

**Many thanks to my subcommittee and NSCSS
colleagues for sharing their expertise**