

# Trends in Follow-up Testing among Patients Positive for Chlamydia and Gonorrhea in Veterans Health Administration (VHA), 2013-2019



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## BACKGROUND

Chlamydia (CT) and gonorrhea (GC) infections are an ongoing public health issue<sup>1-3</sup>. CDC recommends testing patients with CT/GC for other sexually transmitted illnesses (STIs) as well as repeating CT/GC testing at 3 months<sup>1-3</sup>. If testing at 3 months is not feasible, then testing whenever the patient next seeks medical care within 12 months after initial treatment is recommended<sup>1-3</sup>. We described testing for HIV and syphilis within 12 months of a positive CT/GC result as well as repeat testing among CT/GC cases in VHA.

## METHODS

Molecular laboratory testing records for CT/GC during 1/1/2013-12/31/2020 (through 2020 to allow up to 1 year for repeat testing) were retrieved from VHA data sources for individuals tested in outpatient and inpatient settings. Non-molecular testing was excluded due to the limited number of non-molecular tests. Patients were evaluated for HIV and syphilis testing within 365 days of initial positive CT/GC result. Repeat CT/GC testing within one year after a positive CT/GC test was evaluated. Repeat testing breakdowns included those tested at <90 days, 90-365 days, and no repeat testing completed after a CT/GC positive result. Differences in characteristics of CT/GC positive patients associated with receiving recommended testing were assessed using the chi-squared or Fisher's exact tests. Odds ratios (OR) and 95% confidence intervals (CI) were calculated. Age medians and interquartile ranges were calculated.

## RESULTS

- ▶ 41,630 of 1,005,762 (4.1%) CT results (36,138 unique patients) and 17,649 of 1,013,198 (1.7%) GC results (14,598 unique patients) were positive
  - ▶ Median age of positive was 29 years (IQR 25-35) for CT and 36 years (IQR 29-51) for GC with the largest percentage of cases in the <35 years (73.5%) for CT and 25-44 years (58%) for GC
  - ▶ Majority were from 1a medically complex facilities and those in urban areas
- ▶ During CDC preferred timeframe of 3 months (90-119 days) from initial positive test, 3.9% of CT and 2.9% of GC infections had repeat testing
- ▶ Repeat testing within 90-365 days after a positive result were 32.8% for CT and 34.7% for GC
  - ▶ Of CT/GC positives receiving repeat testing, 8.9% of CT and 14.6% of GC were again positive
- ▶ HIV testing was performed for 72.4% and 65.5% CT and GC first positives, while syphilis testing was completed for 66.5% and 60.5% CT and GC, respectively
  - ▶ HIV was positive in 2.1% and 5.9% and syphilis was positive in 4.1% and 11.3%, respectively.
- ▶ Compared to age group 25-34 years with CT or GC, those <25 years had higher odds of inappropriate repeat testing (i.e., retested <90 days, or not retested within 365 days after positive) but had lower odds of not being tested for HIV and syphilis
- ▶ CT/GC positive males had higher odds of not being tested for HIV and syphilis

### REFERENCES:

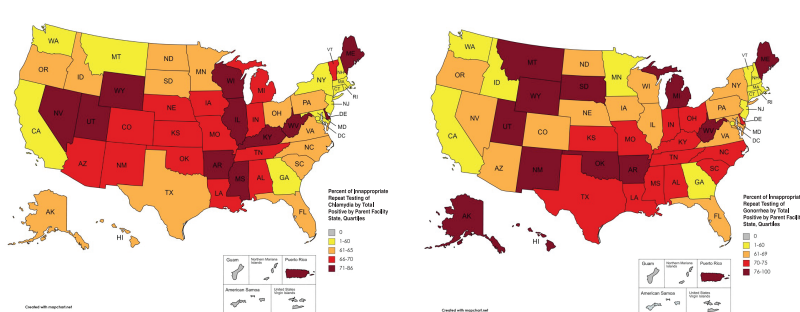
1. Workowski KA, Berman S. Centers for Disease Control and Prevention (CDC). Sexually transmitted diseases treatment guidelines, 2010. *MMWR Recomm Rep*. 2010;59(RR-12):1-110.
2. Workowski KA, Bolan GA. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015 [published correction appears in *MMWR Recomm Rep*. 2015 Aug 28;64(33):924]. *MMWR Recomm Rep*. 2015;64(RR-03):1-137.
3. Workowski KA, Bachmann LH, Chan PA, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. *MMWR Recomm Rep*. 2021;70(4):1-187. Published 2021 Jul 23. doi:10.15585/mmwr.r7004a1.

Table. Repeat testing in CT and GC cases in VHA, 2013-2019

	Repeat Testing after Positive CT (N=41630) Test within 365 days				Repeat Testing after Positive GC (N=17649) Test within 365 days				
	Repeat Testing in 90-365 Days From CT POS Result (N=3849)	Repeat Testing in 90-365 Days From CT POS Result (N=49)	Odds Ratio (CI)	No Repeat Testing in 90-365 Days From CT POS Result (N=31)	Odds Ratio (CI)	Repeat Testing in 90-365 Days From GC POS Result (N=2152)	Odds Ratio (CI)	No Repeat Testing in 90-365 Days From GC POS Result (N=2774)	Odds Ratio (CI)
<b>Gender</b>									
M	3759 (27.5)	1995 (29.8)	referent	6001 (31.2)	referent	789 (32.4)	309 (12.3)	769 (2.8)	referent
F	8690 (72.5)	4976 (70.2)	<b>0.9 (0.8-0.9)</b>	14742 (84.8)	<b>0.8 (0.8-0.9)</b>	5300 (97.4)	1783 (92.5)	<b>0.7 (0.6-0.8)</b>	<b>1.6 (1.4-1.8)</b>
<b>Age, Median (Interquartile Range)</b>	30 (26-36)	30 (26-36)	NA	28 (24-34)	NA	35 (29-47)	36 (30-51)	NA	37 (30-52)
<b>Age Groups</b>									
<25	2099 (15.6)	1200 (18.3)	<b>1.2 (1.1-1.3)</b>	6393 (29.8)	<b>2.3 (2.1-2.4)</b>	447 (2.0)	174 (6.8)	<b>1.3 (1.1-1.4)</b>	<b>7.2 (7.0)</b>
25-34	7403 (54.3)	3499 (53.4)	referent	8303 (46.7)	referent	2544 (14.0)	768 (15.0)	referent	3008 (28.2)
35-44	2561 (18.6)	1081 (16.7)	<b>1.0 (0.9-1.1)</b>	2095 (11.3)	<b>0.9 (0.9-1.0)</b>	1340 (22.3)	420 (22.1)	<b>1.1 (1.0-1.1)</b>	<b>1.0 (1.0-1.1)</b>
45-54	1060 (7.9)	488 (7.0)	<b>0.9 (0.8-1.0)</b>	1266 (5.9)	<b>0.9 (0.8-1.0)</b>	885 (14.5)	321 (14.4)	<b>1.2 (1.0-1.4)</b>	<b>1.9 (1.7-2.1)</b>
55-64	608 (4.5)	227 (3.5)	<b>0.6 (0.7-0.6)</b>	703 (3.5)	<b>0.9 (0.8-1.0)</b>	660 (10.0)	290 (13.5)	<b>1.5 (1.4-1.7)</b>	<b>1.7 (1.5-1.9)</b>
65-74	181 (1.3)	87 (1.3)	<b>1.0 (0.9-1.1)</b>	198 (0.9)	<b>0.8 (0.7-0.9)</b>	194 (3.2)	128 (5.9)	<b>2.2 (1.7-2.8)</b>	<b>4.7 (3.0)</b>
75+	12 (0.1)	4 (0.1)	<b>1.1 (0.4-2.8)</b>	15 (0.1)	<b>0.9 (0.4-2.0)</b>	20 (0.7)	16 (0.7)	<b>2.7 (1.4-5.2)</b>	<b>48 (0.5)</b>
<b>Test Result</b>									
Positive	12475 (93.4)	5922 (90.4)	referent	NA	NA	5203 (95.0)	1883 (68.5)	referent	NA
Negative	1179 (8.6)	626 (9.6)	<b>1.1 (1.0-1.2)</b>	NA	NA	918 (115.0)	291 (11.5)	<b>0.9 (0.8-1.0)</b>	NA
Unknown	1 (0.01)	0 (0)	<b>1.1 (0.04-33.4)</b>	NA	NA	0 (0)	0 (0)	<b>2.8 (0.06-140.0)</b>	NA
<b>Race/Ethnicity</b>									
American Indian or Alaska Native	141 (1.0)	71 (1.1)	<b>0.9 (0.7-1.2)</b>	227 (1.1)	<b>0.9 (0.8-1.2)</b>	40 (1.0)	25 (1.2)	<b>1.1 (0.7-1.7)</b>	<b>58 (0.6)</b>
Asian	372 (2.8)	146 (2.3)	<b>0.9 (0.8-1.0)</b>	303 (1.4)	<b>0.8 (0.7-0.9)</b>	43 (2.0)	24 (1.2)	<b>1.0 (0.8-1.4)</b>	<b>64 (0.7)</b>
Black or African American	5541 (40.6)	2181 (33.3)	<b>0.7 (0.7-0.8)</b>	7992 (37.3)	<b>0.8 (0.8-0.9)</b>	3406 (95.7)	1204 (55.4)	<b>0.8 (0.7-0.8)</b>	<b>5164 (95.1)</b>
Hispanic/Latino	451 (3.3)	213 (3.3)	<b>0.9 (0.7-1.0)</b>	530 (2.5)	<b>0.7 (0.6-0.8)</b>	140 (3.2)	49 (2.3)	<b>0.9 (0.8-1.1)</b>	<b>102 (1.7)</b>
More than one race	354 (2.6)	130 (2.0)	<b>0.8 (0.6-0.9)</b>	363 (1.7)	<b>0.7 (0.6-0.8)</b>	158 (2.4)	39 (1.8)	<b>0.8 (0.6-0.9)</b>	<b>189 (2.0)</b>
Native Hawaiian or other Pacific Islander	361 (2.6)	91 (1.4)	<b>1.0 (0.8-1.3)</b>	947 (4.6)	<b>1.1 (1.0-1.5)</b>	58 (0.9)	21 (1.1)	<b>0.9 (0.8-1.7)</b>	<b>64 (0.7)</b>
Unknown	498 (3.6)	322 (4.9)	<b>1.2 (1.0-1.4)</b>	3055 (14.9)	<b>1.2 (1.1-1.4)</b>	172 (2.8)	79 (3.6)	<b>1.2 (0.9-1.5)</b>	<b>341 (3.6)</b>
White	6223 (46.0)	2085 (31.9)	referent	6526 (29.5)	referent	2664 (52.7)	808 (17.9)	referent	3202 (58.0)
<b>Facility</b>									
Rural	328 (2.4)	184 (2.8)	<b>1.2 (1.0-1.4)</b>	634 (3.0)	<b>1.2 (1.1-1.4)</b>	95 (3.6)	63 (3.2)	<b>1.9 (1.4-2.6)</b>	<b>292 (3.2)</b>
Urban	13321 (97.6)	6364 (97.2)	referent	20799 (97.0)	referent	6224 (96.4)	2089 (97.1)	referent	6068 (96.8)
<b>Medical Complexity of Facility</b>									
1a - High Complexity	7987 (58.5)	3509 (53.6)	referent	1077 (43.0)	referent	3549 (58.0)	1144 (53.2)	referent	4608 (50.8)
1b - High Complexity	2592 (19.0)	1079 (16.4)	<b>0.9 (0.9-1.0)</b>	3354 (14.7)	<b>1.1 (1.0-1.1)</b>	1533 (25.1)	488 (22.7)	<b>1.0 (0.9-1.1)</b>	<b>2175 (23.2)</b>
1c - High Complexity	1197 (8.8)	615 (9.4)	<b>1.2 (1.1-1.3)</b>	1001 (8.9)	<b>1.4 (1.3-1.5)</b>	540 (8.0)	235 (10.9)	<b>1.4 (1.1-1.8)</b>	<b>1.4 (1.1-1.8)</b>
2 - Medium Complexity	724 (5.3)	426 (6.5)	<b>1.3 (1.2-1.5)</b>	1274 (5.9)	<b>1.5 (1.4-1.7)</b>	249 (4.1)	122 (5.7)	<b>1.5 (1.2-1.9)</b>	<b>637 (6.8)</b>
3 - Low Complexity	663 (4.9)	412 (6.3)	<b>1.4 (1.2-1.6)</b>	1239 (5.8)	<b>1.8 (1.6-1.9)</b>	182 (3.0)	104 (4.9)	<b>1.8 (1.4-2.3)</b>	<b>442 (4.7)</b>
Isolated	486 (3.6)	513 (7.8)	<b>2.4 (2.1-2.7)</b>	4608 (21.7)	<b>4.3 (3.9-5.2)</b>	64 (1.2)	59 (2.6)	<b>2.9 (2.0-4.1)</b>	<b>299 (3.2)</b>

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Figure. Percent of Inappropriate Repeat Testing of CT/GC by Total CT/GC Positive by Parent Facility State 2013-2019, Quartiles



## LIMITATIONS

- ▶ Repeat testing or HIV/syphilis testing performed outside VHA were not captured
- ▶ Pregnant females, for whom testing at 4 weeks is recommended were not identified
- ▶ Indication for repeat testing was not identified (i.e. - whether the patient presented with new symptoms)
- ▶ Anatomical site of CT and GC testing was not identified (i.e. - oropharyngeal, rectal, or genitourinary)
- ▶ Other risk factors for STIs were not evaluated such as sexual orientation, previous history of STI, individual sexual activity as well as the sexual activity of partners
- ▶ Non-Veterans who received care at VHA were not separated out from Veterans
- ▶ Syphilis testing was not determined to be previously known or new
- ▶ Only HIV and syphilis were evaluated as other STIs
- ▶ ICD-10-CM codes for CT and GC were not reviewed

## CONCLUSIONS

- ▶ Only 3-4% of CT/GC cases have appropriate repeat testing at 3 months (90-119 days) with roughly 33% with some repeat testing 3-12mo after positive result
  - ▶ In those with known HIV, appropriate repeat testing nearly doubled possibly due to specialized care with infectious disease specialists
  - ▶ Appropriate repeat testing is low in those who are <35 years possibly due to less contact with the medical system
- ▶ Nearly 1/3rd were not tested for HIV/syphilis, many of whom were <35 years and of Black and White race
- ▶ Automated reminders for repeat testing and other STI testing could potentially be developed and targeted to the population most at risk
- ▶ VHA providers may benefit from additional education on CDC recommended STI guidelines

