

Safety and Effectiveness of Same-Day *Chlamydia trachomatis* and *Neisseria gonorrhoeae* Screening and Treatment Among Gay, Bisexual, Transgender, and Homeless Youth in Los Angeles, California, and New Orleans, Louisiana

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Background: Gay, bisexual, transgender, and homeless youth are at risk of sexually transmitted infections. As part of an adolescent human immunodeficiency virus prevention study, we provided same-day *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) testing and treatment. We aimed to evaluate the feasibility and effectiveness of same-day CT and NG treatment on the proportion of participants receiving timely treatment.

Methods: We recruited adolescents with high sexual risk behaviors aged 12 to 24 years from homeless shelters, lesbian, gay, bisexual, and transgender organizations, and community health centers in Los Angeles, California, and New Orleans, Louisiana from May 2017 to June 2019. Initially, participants were offered point-of-care pharyngeal, rectal, and urethral/vaginal CT and NG testing and referral to another clinic for treatment. After March 2018 in Los Angeles and November 2018 in New Orleans, we provided same-day treatment (and partner treatment packs) for study participants. We measured the proportion of participants who

received same-day treatment and the median time to treatment. We collected frequency of partner treatment and any reported adverse treatment-related events.

Results: The proportion of participants receiving same-day CT and NG treatment increased from 3.6% (5/140) to 21.1% (20/95; Δ 17.5%; 95% confidence interval, 9.2%–26.9%) after implementation of same-day testing and treatment. The median time to treatment decreased from 18.5 to 3 days. Overall, 36 participants took a total of 48 partner treatment packs. There were no reported treatment-related adverse events.

Conclusions: Providing sexually transmitted infection treatment to adolescents at the same visit as testing is feasible and safe, and can increase the proportion of individuals receiving timely treatment.

Chlamydia trachomatis (CT) and *Neisseria gonorrhoeae* (NG) are the most common reported infectious diseases. According to the Centers for Disease Control and Prevention (CDC), young people aged 15 to 24 years account for half of all new sexually transmitted infections (STIs) each year.¹ Timely and appropriate treatment of CT and NG are important to reduce the risk of infertility and pelvic inflammatory disease and reduce transmission to sex partners.¹

Gay, bisexual, and transgender youth may also be at greater risk of STIs. Those populations often report risk-taking behaviors such as higher number of sex partners, failure to use condoms consistently and correctly, and less frequent STI screening due to concerns about confidentiality and stigma.² Negative attitudes toward homosexuality, poor mental health, and substance abuse are also associated with increased likelihood of condomless anal sex and increased number of sex partners among this population.³ One study in San Francisco found that street-recruited youth were significantly more likely than clinic-recruited youth to engage in survival sex, have multiple partners, have partners who inject drugs, or have partners who are human immunodeficiency virus infected.⁴

Standard CT and NG nucleic acid amplification testing does not provide clinics and patients with immediate results, thus creating a need for multiple visits for testing and treatment.⁵ A previous study found that 40% of female adolescents with untreated CT and NG infections were lost to follow-up after leaving an emergency department after testing.⁶ In addition, a recent study found that only 60% of STI medications prescribed in a pediatric emergency department are filled in the pharmacy once the patient leaves.⁷ In clinics in California, prescription fill rates were lowest at 47% for patients 18 years and younger, demonstrating the need for on-site treatment, especially among younger patients.⁸

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The delay between STI testing and treatment may also cause many health care providers to rely on empiric treatment to avoid potential loss-to-follow-up for untreated patients. However, empiric treatment can lead to overtreatment of STIs, potentially perpetuating drug resistance.^{9,10} One study found a significant reduction in unnecessary antibiotic treatment of CT and NG in patients receiving a point-of-care STI test compared with those receiving standard testing in an emergency department.¹¹

Point-of-care community-based STI testing presents an opportunity to increase access to STI screening and reduce STI transmission among adolescents and young adults, particularly high-risk adolescents who do not traditionally have access to sexual health services.¹² Many previous studies evaluating testing and treatment of STIs have been conducted in emergency departments or outside the United States, and few focus on testing and treatment among gay, bisexual, transgender, or homeless youth in community health settings.⁶⁻⁸ As part of the Adolescent Medicine Trials Network for human immunodeficiency virus/AIDS Interventions,^{13,14} we provided same-day CT and NG testing and treatment among a sample of adolescents in Los Angeles and New Orleans. We aimed to evaluate if providing same-day testing and treatment would increase the proportion of participants receiving treatment and reduce the overall time to treatment.

MATERIALS AND METHODS

Recruitment

From May 2017 to June 2019, we recruited gay, bisexual, and transgender youth; youth with a history of mental health disorders; and youth with a history of incarceration aged 12 to 24 years. We recruited participants from homeless shelters; lesbian, gay, bisexual, transgender organizations; and community health centers, and using social media and online dating apps such as Grindr, Tinder, Jack'd, Scruff, and Chappy in Los Angeles, California, and New Orleans, Louisiana. We referred eligible participants from social media and dating sites to one of our existing sites for enrollment. We determined study eligibility using a questionnaire that measured demographic information and risk behavior of participants, such as illicit drug use, needle sharing, condomless sex, and number of sex partners. Answers to the questionnaire were weighted, and if a participant had an overall risk score ≥ 7 , they were enrolled in the study.¹⁵

STI Testing Procedures

Participants were enrolled in the study for 24 months. Every 4 months, participants were scheduled for a study visit where they would self-collect pharyngeal, rectal, and urine, or vaginal samples for CT and NG testing. We tested samples using the Cepheid GeneXpert CT/NG Assay (Sunnyvale, CA), which is a real-time, polymerase chain reaction test that provides results in 90 minutes.¹⁶ It is Food and Drug Administration approved for urogenital samples and has also been verified using pharyngeal and rectal swabs in accordance with the Clinical Laboratory Improvement Amendments Act.¹⁷ Study staff instructed participants on self-collecting specimens using a flashlight and by providing oral instructions. We allowed participants to opt out of any test they did not want to receive. We recorded STI screening and treatment results in the mobile application CommCare (Dimagi, Cambridge, MA).

STI Treatment Procedures

Before March 2018 in Los Angeles and November 2018 in New Orleans, after a positive CT or NG test result, participants were referred to a local clinic or their primary care doctor for

treatment. All partner medical clinics agreed to provide STI treatment in accordance with CDC recommendations.¹⁸ After March 2018 in Los Angeles and between November 12 and February 28 in New Orleans, participants were offered same-day treatment and expedited partner therapy packs by our study staff.

We encouraged participants to wait the 90 minutes for their test results to receive immediate treatment. If a participant chose not to stay, our study team called the participant after a positive result to schedule a follow-up visit for treatment. At the follow-up visit, we offered participants a treatment pack for themselves and up to 10 additional treatment packs for their recent sex partners. Upon distribution of treatment, we informed the participants of any potential adverse effects and instructed the participants to call the study physician with any questions. In addition, participants still had the option to receive treatment with their primary care provider, if they had one, or a referral to a local medical clinic. We contacted participants to confirm treatment with their primary care provider, and if unable to reach the participant, we would request medical records from the clinic.

We treated vaginal, urethral, and pharyngeal CT infections with a 1-g oral dose of azithromycin, whereas we treated rectal CT infections with 100 mg oral doxycycline twice daily for 7 days. We treated NG infections with 1 dose of 400 mg oral cefixime and 1 g oral azithromycin. For NG infections accompanied with a rectal CT infection, we treated with 100 mg oral doxycycline twice daily for 7 days and 1 dose of 400 mg oral cefixime. In addition to medication, the treatment packs contained the name of the medication, dose, detailed instructions on how to take the medication, contact information for both the study physician and the interviewer, the medication lot number, and the medication expiration date.

Measurements

We compared demographic characteristics of our population including birth sex, gender identity, race/ethnicity, education, employment, type of insurance, and location of testing and if same-day treatment was received. We recorded the number of partner treatment packs taken by participants and recorded any reported adverse effects to the CT or NG medications.

Statistical Analysis

We measured the proportion of participants who received same-day treatment and treatment within 30 days for a positive CT or NG infection before and after offering same-day testing and treatment by location (Los Angeles or New Orleans), using a χ^2 test for significance. An occurrence of an STI would be considered if any 1 of the 6 STI tests (CT/NG vaginal/urethral, rectal, pharyngeal) was reactive. Because of a skewed distribution, we chose to compare median days to treatment by each demographic characteristic, testing for differences using the Mann-Whitney test. Because those methods do not account for repeated measures, in the analysis, we chose to include only those participants who tested positive once in the available data. All analyses were performed using SAS 9.4.

The University of California, Los Angeles Institutional Review Board (No. 16-001674-AM-00006) and Tulane University Review Board (No. 1033876) approved the study protocol. Any protocol deviations or indications of adverse events were reported to the institutional review board. The study was registered at ClinicalTrials.gov on April 28, 2017 (No. NCT03134833).

RESULTS

We recruited 235 participants with positive CT or NG infections. Of those participants, 126 (53.6%) had a CT infection only, 79 (33.6%) had a NG infection only, and 30 (12.7%) had a

coinfection with CT and NG. We found similar proportions of infections before and after offering same-day treatment. Before offering same-day testing and treatment, the proportion of individuals with reinfections was 20%, whereas the proportion of participants with reinfections after providing same-day testing and treatment was 12% (prevalence ratio, 0.60; 95% confidence interval, 0.33–1.09).

Table 1 shows the demographic information of the study participants including birth sex, gender identity, race/ethnicity, education, employment, type of insurance, and homelessness, as well as the median days to treatment for each characteristic. In addition, 110 participants (46.8%) reported previous illicit drug use in their lifetime, and only 91 (39.2%) reported 100% condom usage. The median number of sex partners in the last four months in our sample was 3 (interquartile range, 1–4 partners).

Figure 1 shows the proportion of adolescents aged 14 to 24 years who received same-day treatment or treatment within 30 days for CT or NG infections in Los Angeles and New Orleans before and after we provided same-day testing and treatment as part of our study. The overall proportion of participants receiving same-day treatment increased from 3.6% to 21.1% (Δ 17.6%; 95% confidence interval, 9.2%–26.9%) after offering same-day testing and treatment. In Los Angeles, the proportion of participants receiving same-day treatment increased from 0% (0/27) to 23.2% (19/82). In New Orleans, the proportion increased from 4.4% (5/114) to 7.7% (1/13).

Thirty-six (37.9%) participants in our study took a total of 48 partner treatment packs (median, 1 pack taken per participant [range, 1–3 packs]). In Los Angeles, 31 participants took a total

TABLE 1. Select Characteristics, Including Demographic Information, Location of Testing, and Median Days to Treatment of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) Among Adolescents Aged 14 to 24 Years from May 2017 to June 2019, Los Angeles and New Orleans

	N Participants (%)	Median Time to Treatment Before Same-Day Treatment, n days [Interquartile Range] (n = 140)	Median Time to Treatment After Same-Day Treatment, n Days [Interquartile Range] (n = 95)	P
Overall	235	18.5 [5.0–46.5]	3.0 [0.0–12.0]	<0.01
Location				
Los Angeles	109 (46.4)	22.0 [6.0–54.0]	3.0 [0.0–13.0]	<0.01
New Orleans	126 (53.6)	15.0 [4.0–44.0]	7.5 [2.0–12.0]	0.05
Birth sex				
Male	190 (80.9)	15.0 [5.0–44.0]	3.0 [0.0–21.0]	<0.01
Female	45 (19.1)	27.5 [3.0–59.0]	2.0 [1.0–8.0]	0.04
Gender identity				
Men who have sex with men	129 (54.9)	10.0 [5.0–32.0]	3.5 [0.0–25.0]	0.01
Transgender/gender nonconforming	24 (10.2)	10.0 [2.0–15.0]	1.0 [0.0–2.0]	0.06
Heterosexual men	38 (16.2)	31.0 [8.0–65.5]	9.0 [5.0–32.0]	0.34
Heterosexual women	25 (10.6)	25.0 [3.0–62.0]	4.5 [0.5–11.0]	0.33
Nonheterosexual female	19 (8.1)	30.0 [3.0–59.0]	3.0 [1.0–5.0]	0.17
Race/Ethnicity				
African American	151 (64.3)	16.0 [4.0–43.0]	5.0 [1.0–10.0]	<0.01
Asian/Hawaiian Pacific Islander/American Indian /Alaska Native	13 (5.5)	59.0 [10.0–83.0]	0.0 [0.0–21.0]	0.4
Latino	48 (20.4)	42.0 [15.5–71.0]	3.5 [0.0–10.0]	0.29
White	19 (8.1)	10.5 [3.0–51.5]	17.5 [0.5–42.5]	0.99
Other race	4 (1.7)	18.5 [7.0–30.0]	3.0 [3.0–3.0]	0.48
Education				
Below high school	62 (26.4)	15.0 [4.0–31.0]	1.0 [0.0–31.0]	0.08
High school diploma/equivalent	58 (24.7)	15.5 [3.0–56.5]	5.0 [2.0–11.0]	0.13
Some higher education	98 (41.7)	22.0 [6.0–44.0]	3.0 [0.5–11.0]	<0.01
Completed Higher education	17 (7.2)	45.0 [6.0–84.0]	1.0 [1.0–12.0]	0.32
Employment				
Employed	103 (44.4)	10.0 [3.0–34.0]	5.0 [0.0–12.0]	0.04
Unemployed	63 (27.2)	27.5 [6.0–85.5]	5.0 [1.0–32.0]	0.05
Student	66 (28.4)	19.0 [3.0–30.0]	1.5 [0.5–4.5]	<0.01
Insurance				
Medicaid	90 (39.5)	7.0 [3.0–30.0]	5.0 [1.0–31.0]	0.37
Medicare	27 (11.8)	26.0 [10.0–54.0]	7.0 [0.0–21.5]	0.11
Private	47 (20.6)	10.0 [4.0–66.0]	3.0 [1.0–7.0]	0.04
Other	1 (0.4)	54.0 [54.0–54.0]	NA	NA
Uninsured	61 (26.8)	30.0 [8.5–57.0]	1.0 [0.0–9.0]	<0.01
Been homeless in lifetime				
No	122 (51.9)	24.5 [4.0–49.0]	2.5 [0.0–7.0]	<0.01
Yes	113 (48.1)	14.5 [5.0–43.0]	5.5 [1.0–32.0]	0.29
Been homeless within the past 30 d				
Recent, no	161 (69.1)	34.0 [5.0–43.5]	3.0 [0.0–9.0]	<0.01
Recent, yes	72 (30.9)	12.0 [4.5–52.5]	5.5 [1.5–33.0]	0.39

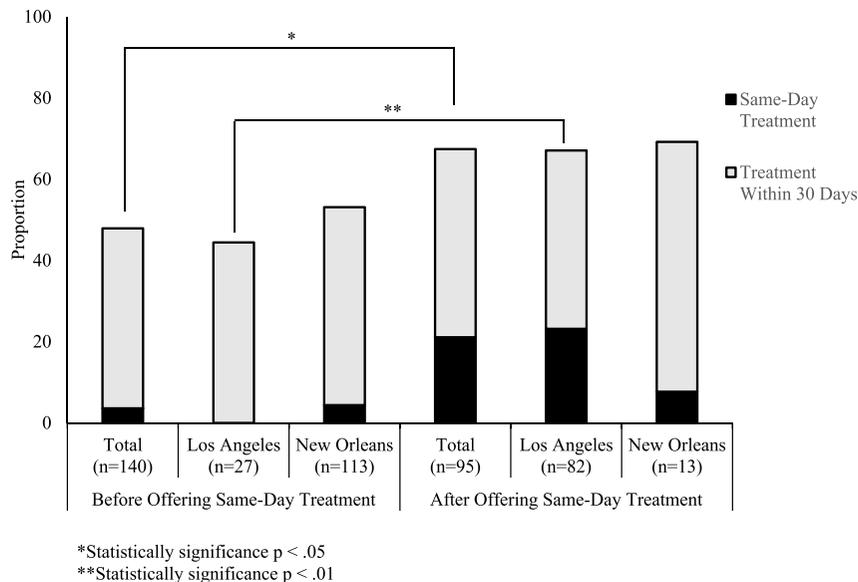


Figure 1. Proportion of adolescents aged 14 to 24 years receiving same-day treatment of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) or treatment within 30 days of testing in Los Angeles and New Orleans from May 2017 to June 2019.

of 43 partner treatment packs, whereas in New Orleans, 5 participants took a total of 5 partner treatment packs.

There were no reported adverse effects to any of the medications.

DISCUSSION

As part of a large adolescent behavioral trial to reduce sexual behaviors, we evaluated the impact of same-day testing and treatment on the time to treatment of CT and NG infections. We measured the proportion of adolescents receiving treatment of CT and NG in Los Angeles and New Orleans. Providing same-day CT and NG treatment after testing significantly increased the proportion of participants receiving same-day treatment in Los Angeles. In addition, the overall median number of days to treatment was reduced by at least one-half in both locations. However, same-day treatment was only provided in New Orleans for approximately 3 months because of limited antibiotic supply. In addition, many participants in New Orleans lived in a narrower geographic area, allowing for more referrals to accessible health clinics. Because only 13 participants had active infections during the period same-day testing and treatment was offered, our analysis was underpowered in New Orleans.

Adolescents present challenges for follow-up and timely treatment.¹⁹ In a previous study in a teen health center, one-third of patients were not treated for STIs for more than 7 days.⁸ In our study, the median time to treatment was more than 2 weeks in both New Orleans and Los Angeles before same-day testing and treatment was offered. Previous studies have implemented new strategies to try and increase STI screening and treatment among hard-to-reach populations. In San Francisco, offering field delivered therapy was successful in increasing treatment completion for CT and NG infections among individuals who were unable or unlikely to visit a clinic for treatment.²⁰ Studies outside the United States in Botswana, the Democratic Republic of Congo, Haiti, South Africa, and Vietnam, screened individuals for CT, NG, and *Trichomonas vaginalis* using point-of-care testing and found a high acceptability of screening and feasibility of same-day treatment.²¹ Another study in London found that using point-of-care STI testing greatly reduced the time from clinic

attendance to treatment of asymptomatic CT and NG infections and notification of results.²²

Very few studies evaluating the use of the Cepheid GeneXpert for point-of-care same-day testing and treatment of STIs have occurred in the United States. A pilot study among students used the Cepheid GeneXpert to test for CT and NG and provided same-day treatment as needed.²³ They found high acceptability of the point-of-care test; however, their study was limited by a small sample size, as only 3 students were positive for CT. Further implementation science research is needed to expand the use of same-day STI testing and treatment, particularly among gay, bisexual, transgender, and homeless youth.

Expedited partner therapy is a proven health care practice that allows clinicians to give patients medications or prescriptions to distribute to their partners, especially if the partner is unable or unlikely to seek care in a timely matter. The American Academy of Family Physicians and the CDC support clinicians in the treatment of sex partners of individuals diagnosed as having CT or NG.²⁴ A previous study found that providing expedited partner therapy is less costly and treats more partners than standard partner referral.²⁵ In our study, although we did potentially treat 48 sex partners with expedited partner therapy packs, only approximately one-third of the participants offered partner treatment packs took them. Greater efforts are needed to increase STI treatment for all sex partners, allowing for quicker treatment and the prevention of future transmission.

Our study was limited by its modest sample size, particularly for participants receiving same-day treatment in New Orleans. We also used convenience sampling because participants were recruited through online advertising and advertising in community centers. That may have led to some selection bias resulting in participants who were more likely to engage in the health care system or seek STI testing and treatment. In addition, our sample may not be representative of all lesbian, gay, bisexual, transgender, or homeless adolescents in Los Angeles and New Orleans.

Although offering same-day CT and NG treatment significantly improved the time to treatment and proportion of participants receiving treatment, some participants remained untreated if they were not able or willing to wait 90 minutes for the test results. Efforts must continue to improve point-of-care STI tests

and reduce the time from testing to results to increase treatment for all individuals. Continuing to reduce the time-to-treatment is important to prevent future transmission of CT and NG infections. We found that providing same-day testing and treatment of CT and NG was feasible and safe, and can increase the proportion of high-risk adolescents in community health settings receiving timely treatment.

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