Impact of Expedited Partner Therapy Implementation on STI Reinfection in an Urban Public Health Clinic

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Summary:

This study on the impact of Expedited Partner Therapy in a public health clinic suggests that Expedited Partner Therapy is a valuable strategy for the prevention of sexually transmitted reinfection.

Abstract

Background: Sexually transmitted infections are on the rise nationwide. Lack of partner treatment has been identified as an area for improvement in the epidemic. Expedited partner therapy is one proposed strategy for the prevention of sexually transmitted reinfection.

Methods: Expedited Partner Therapy was implemented in a large urban public health department in North Carolina. All patients with positive chlamydia, gonorrhea, and/or trichomonas results treated at the health department during the study period were included in the study. Eligible partners of patients diagnosed with sexually transmitted infections were also dispensed expedited partner therapy. Reinfection rates were calculated pre- and post-implementation.

Results: There were a total of 3,881 encounters with positive chlamydia, gonorrhea, or trichomonas results over the study period. Thirty-four patients (7.3%) of patients with positive STI results in the intervention phase received Expedited Partner Therapy. Of patients that received the intervention, 32.4% returned for retesting within the recommended time frame (120 days) and none were reinfected at follow-up.

Conclusion: Overall reinfection rate was 20.9%. The reinfection rate fell by 6.4 percentage points in the intervention phase, an overall 29.3% decrease in reinfections compared with the pre-intervention period. This change cannot be attributed to Expedited Partner Therapy alone as very few patients received the intervention. However, this analysis suggests that Expedited Partner Therapy is a valuable tool for preventing reinfection in patients diagnosed with sexually transmitted infections. A longitudinal study with a larger sample size would better evaluate the impact of EPT on reinfection rates.

Key Words: sexually transmitted infections, expedited partner therapy, partner management, reinfection, public health

Introduction

Sexually transmitted infections (STIs) are on the rise in men and women, in all regions of the US, across all racial/ethnic groups.[1] In 2018, STIs reached record high numbers, with upwards of 2.5 million individual cases reported.[1] This data represents a fraction of the true burden of STIs since many cases continue to go undiagnosed or unreported. A new Centers for Disease Control and Prevention (CDC) modeling study estimated 1 in 5 people in the United States had an STI at any given time in 2018, signaling a major public health crisis.[2]

Curable STIs, such as Chlamydia (CT), Gonorrhea (GC), and Trichomonas (TV), have been overshadowed in recent years by a heightened public health focus on Human Immunodeficiency Virus (HIV), but they are an important cause of morbidity.[3] Total estimated incident cases of CT, GC, and TV in 2018 were 4 million, 1.6 million, and 6.9 million, respectively.[2] While many infections are asymptomatic, untreated CT/GC infection can lead to adverse health outcomes, most notably pelvic inflammatory disease (PID), a major cause of long-term sequelae including infertility, ectopic pregnancy, and chronic pelvic pain.[1] Trichomonas is associated with preterm delivery and symptomatic vaginitis.[1] Additionally, these STIs are thought to increase an individual's risk of acquiring and/or transmitting HIV infection.[4] For the purpose of this study, STI will refer to CT, GC, and TV.

Lack of partner treatment plays an important role in the growing STI epidemic.[5] Research suggests a substantial proportion of patients who are treated for CT, GC, and/or TV are reinfected within the first several months of initial treatment.[6,7] A systematic review of the literature reported the median proportion of females reinfected with chlamydia is 13.9% (range

0-32%) and gonorrhea is 11.7%(range 2.6-40%).[7] Similarly, repeat chlamydia infection among men had a median probability of 11.3% (range 9.8-18.3%) while gonorrhea was 7% (range 0-30%).[6] Most post-treatment infections are not thought to be the result of treatment failure, but rather reinfection from an untreated sex partner.[8] Reinfection is associated with an increased risk of complications in women secondary to the ascension of bacteria into the upper genital tract.[7] Therefore, public health interventions to prevent STI reinfections are vital.

Comprehensive notification and treatment of sex partners is an essential, albeit underappreciated, component of the management of the index case (patient diagnosed with STI.) The goal of partner notification is threefold:[3]

(1) For the index patient, it aims to prevent reinfection,

(2) For sexual partners, it aims to identify and treat undiagnosed STIs, and

(3) On a population-level, it aims to interrupt transmission of STIs.

Various strategies have been proposed to ensure that all partners of patients with STIs are identified, tested, and treated. Traditionally, the index case is advised to notify their partner and refer them for testing and treatment (patient referral). Patient referral requires little time and few resources and training but has proven to be suboptimal, resulting in low partner treatment uptake.[9] Alternatively, the healthcare provider may contact partners directly (provider referral). In some jurisdictions, specially-trained Disease Intervention Specialists (DIS) are tasked with notifying and tracing contacts of patients with STIs in order to ensure they obtain appropriate testing and treatment.[4] This time and labor-intensive strategy is increasingly limited due to a mismatch between public health resources and highly prevalent STIs; most health departments now only routinely attempt DIS services for HIV and syphilis.[8]

Expedited partner therapy (EPT) is another promising partner management strategy. Expedited partner therapy is the clinical practice of treating the sex partners of patients diagnosed with STIs by providing prescriptions or dispensing medications to the patient to deliver to their partner without any prerequisite medical evaluation or professional counseling.[10] This potentially enables health care providers to reach partners with social, financial, or logistical barriers that may preclude a clinic visit.[11] Expedited partner therapy is endorsed by national organizations such as the American College of Obstetricians and Gynecologists, American Academy of Family Physicians, American Academy of Pediatrics, and Society for Adolescent Health and Medicine. The CDC has recommended EPT for heterosexual men and women since 2006. Expedited partner therapy is not intended to be the first-line or optimal partner treatment option but is an alternative when other partner management strategies are impractical or unavailable and the provider cannot "reasonably ensure" all partners will be promptly treated.[10]

The CDC initially recommended the use of EPT based on its impact on STI reinfection in four early clinical trials.[10] A 2013 Cochrane Review of partner notification strategies found moderate quality evidence that EPT is better than patient referral at preventing STI reinfection.[3] Additional research, however, has demonstrated mixed results; not all studies, have found EPT to be efficacious compared with other partner management strategies.[12,13,14] And, despite widespread medical society endorsement, not all clinicians employ EPT. Perhaps most notable, real-world evidence of the effectiveness of EPT once implemented is lacking.

More research is needed to inform clinical practice and reassure clinicians and public health administrators that EPT is an appropriate and valuable intervention. The purpose of this study is to help address the gap in existing knowledge on the impact of programmatic EPT

implementation. The research question we sought to answer is: what is the impact of EPT implementation on reinfection of individuals diagnosed with CT, GC, and/or TV in a large urban public health clinic? This study will attempt to provide compelling evidence for the use of EPT as a partner management strategy and create a framework that other health departments can use in their own future implementation of EPT.

Materials and Methods

Study Setting and Design

This study took place at a large urban county health department in North Carolina. This county is the center of one of the largest urban areas in the country with a population of 1,100,000 and growing.[15] County residents are racially, ethnically, and socioeconomically diverse with a population is comprised of 46% non-Hispanic white, 31% black, and 14% Hispanic or Latino.[15] An estimated 10.2% of residents live in poverty and more than 120,000 persons or 15.6% of the population is uninsured.[16]

North Carolina has fared especially poorly in the growing STI epidemic, currently ranking 6 out of 50 states for highest rates of CT infection and 9 out of 50 for GC infection.[1] The county where this study took place has some of the highest STI rates in the state. Between 2014 and 2018, CT infection in this county increased by 11% and GC increased by 23%.[17] In 2019, the county CT infection rate was 841.5 cases per 100,000 population and the GC infection rate was 291.9 per 100,000.[17] In comparison, overall US rates are 539.9 and 179.1 cases per 100,000 for CT and GC, respectively.[1]

Expedited partner therapy was implemented in the Family Planning/STI clinic at the health department in August 2020. Patients with a laboratory-confirmed diagnosis of STI were

offered EPT for their partners(s). Index cases were treated with the standard CDC- recommended regimen. For partner management, EPT was offered. All of the index case's sex partners within the past 60 days were eligible for EPT. If the patient had not been sexually active in the past 60 days, their last sex partner was eligible for EPT. The index case must have also reported that their partner was unlikely to present for examination and treatment as in-clinic evaluation is still preferred for partner testing and treatment.[10] In accordance with CDC and state guidelines, exclusion criteria included patients with non-gonococcal urethritis or other diagnosis, known allergy or contraindication to treatment, symptoms of STI, partners of partners, and men who have sex with men except in certain circumstances. Additionally, EPT was not offered in any situation in which the index case's safety would potentially be compromised by partner notification including suspected child abuse, sexual assault, or intimate partner violence. A convenience sample was utilized. All patients seen at the health department with STIs during the study period were eligible for inclusion in this study.

Patients who accepted EPT were provided individual treatment packs for each eligible partner containing medication(s) as appropriate (see Table 1), condoms, and written educational materials. Patients who declined or did not qualify for EPT were given pocket-sized contact cards and instructed to notify their partner(s) per standard health department protocol. All patients and partners treated for STIs were instructed to return in 3 months for retesting according to the CDC guidelines. Treatment was current at the time of the study. Since then, GC treatment guidelines have changed, and the policy has been updated.

Electronic medical record data was retrieved from clinic visits conducted between May 2019 and March 2021. Three study periods were defined as Baseline (May 2019 to February 2020), COVID (March 2020 to July 2020), and Intervention (August 2020 to October 2020).

Descriptive statistics were computed where appropriate. Patient demographics including age, race/ethnicity, and gender were summarized using means (and ranges) and frequencies (percentages) for continuous and categorical measures, respectively. Positive STI tests and return rate were described on an encounter level. This study was approved exempt by the Purdue University Institutional Review Board. Participants were de-identified, and consent was waived.

Measures

Data were compiled in Excel and exported to the Statistical Package for Social Sciences (SPSS) Version 26.0 for analysis. Logistic regression was performed to describe differences in return rates and reinfection rates between the study periods and identify patient demographics and diagnoses associated with odds of return to clinic and reinfection. Reinfection was defined as diagnosis with the same STI at any site (urogenital or extragenital), at a follow-up visit within 120 days of initial diagnosis. Multivariable models examining factors associated with return to clinic or reinfection were fit with patient age, sex, race, ethnicity, and diagnosis of GC, CT, and TV. Socioeconomic status was not assessed as income data is not available due to the nature of the free STI clinic. $P<0.05$ was considered statistically significant.

Results

Eighteen thousand two hundred and ninety unique patients were tested for STIs at 26,086 total encounters between May 10, 2019 and March 5, 2021. There were 3,881 encounters, or 3,459 unique patients, with at least one positive STI result over the study period. Almost ninety percent (89.4%) of patients were seen in clinic only once; the remaining 366 patients visited the clinic up to 5 times during the study period. Two-thirds of clinic visits occurred in the Baseline phase (N=2,548; 65.7%), 22.3% (N= 866) in the COVID phase, and 12.0% (N= 467) during Intervention. Average age at first clinic visit in the study period was 28, ranging from 15 to 79.

Males and females were equally represented in the sample (50.1% and 49.9%, respectively). Over seventy percent of patients identified as Black (73.4%), 15.4% as White, and 14.0% as Hispanic or Latino.

Across all 3,881 encounters, there were 2,421 (62.4%) positive CT tests, 1,147 (29.6%) positive GC tests, and 729 (18.8%) positive TV tests. Following positive results, patients were instructed to return to the clinic in 3 months for retesting. The return rate over the entire study period was 21.9% (849/3881). The return rate varied across the Baseline and COVID phases (22.4% v. 17.6%, respectively; P=0.003), and it is reasonable to combine data from these phases in a conservative approach to compare data before (i.e., Pre-Intervention period) versus during the Intervention period. Return rates during the Pre-Intervention period differed numerically for diagnoses: GC 16.6%, TV 21.5%, CT 22.2%. In the Pre-Intervention period, female gender (OR 1.48, 95% CI 1.21-1.81; P<0.001) and younger age (OR 0.98, 95% CI 0.97-0.99; P=0.002) were associated with increased odds of returning to clinic within 120 days, adjusted for diagnosis. Diagnoses of GC (OR 0.61, 95% CI 0.44-0.83; P=0.002) and TV (OR 0.67, 95% CI 0.47- 0.97; P=0.04) were also independent predictors of return. Return rate to clinic in the Intervention period was 27.2% (P=0.005); neither demographic nor diagnosis were associated with return to clinic in the Intervention period.

There were a total of 922 follow-up encounters within 120 days across phases. Reinfection rate in the baseline phase (23.2%) was higher than either the COVID (17.3%) or Intervention (15.5%) phases. The Pre-intervention (combined Baseline and COVID phases) reinfection rate was 21.9%. Reinfection rate did not differ significantly between the Pre-Intervention and Intervention periods for all diseases (P=0.25) or any particular disease. Male gender (OR 2.14, 95% CI 1.35-3.41; P=0.002), younger age (OR 0.97, 95% CI 0.94-0.99;

157 P=0.04), CT diagnosis (OR 2.12, 95% CI 1.05-4.30; P=0.04), and TV diagnosis (OR 4.21, 95%
158 CI 1.88-0.45; P<0.001) were associated with increased odds of reinfection at a subsequent visit
159 in the Pre- Intervention period; no associations were found in the Intervention period.

160 Thirty-four patients (7.3%) with positive STI results during the Intervention period
161 received EPT. Forty-seven percent (N=16) of these patients had TV, 50% (N=17) had CT, and
162 one patient was diagnosed with both TV and CT. No patients were dispensed EPT for GC during
163 the study period. Average age of the index case was 27.6 years (range 17 to 41). Females (N=30)
164 were given EPT more often than males (N=4). Race/ethnicity in this sample was representative
165 of the clinic population with 70.6% of EPT receivers identifying as Black, 11.8% White, and
166 11.2% other including Hispanic/Latino. Of patients who were offered and accepted EPT, 32.4%
167 (N=11) returned to clinic within 120 days for retesting and none of these patients were found to
168 be reinfected.

169 **Discussion**

170 In this study, overall reinfection rate (20.9%) was similar to previous systematic review
171 findings on STI reinfection.[6,7] The reinfection rate fell by 6.4 percentage points in the
172 Intervention phase, an overall 29.3% decrease in reinfections compared with the Pre-
173 intervention period. Compared to the COVID phase (may be considered the true baseline since
174 the Intervention period also existed during the COVID-19 pandemic), there was a 1.8 percentage
175 point decrease or 10% change in reinfections. This change cannot be attributed to EPT itself as
176 very few patients received the actual intervention. However, it is possible that a behavioral
177 change resulted from EPT policy implementation. Prior to the EPT implementation date,
178 clinicians, nurses, and support staff were thoroughly educated on the risk of STI reinfection and

the importance of partner management. Improved awareness may have altered the way providers and nurses counsel patients at clinic visits which, in turn, may have impacted patient behavior including risky sexual behaviors and with respect to partner notification and retesting. None of the patients that received EPT were reinfected at follow-up. While this is a favorable result, the finding is not significant and should be interpreted with caution given small sample size.

This study was inherently limited due to the observational nature. There is potential for clinician bias in patient selection for the EPT intervention. Expedited partner therapy is not a one-size-fits-all approach; not all patients with positive STI results were offered EPT. Assessment of eligibility for EPT is highly subjective and we do not know how individual practitioners identified specific patients for EPT. There is also potential response bias; patients may not accurately recall, identity, or disclose eligible sexual partner(s). Even if they disclose this information, they may not be willing to contact and/or provide EPT to partner(s). This is likely in part related to the stigma associated with STIs. Information on potential confounders such as patients' relationships and risk factors were not collected as part of this study. Due to small sample size, we were unable to compare demographic variables of EPT-receivers and non-receivers. The overall influence of bias remains unknown.

There are several intermediary steps to achieve partner treatment via EPT.[18] Success is dependent on the clinician, patient, and partner. Researchers call this the EPT continuum: the provider must offer EPT to the patient, the patient must accept EPT, the patient must deliver EPT medication to their sex partner(s), and the partner(s) must take the medication.[18] It is difficult to measure partner treatment via EPT as there is no health care provider contact with the partner. Patients were not surveyed to confirm delivery or acceptance of EPT in this study. The

assumption was made that patients who were given EPT delivered the medication and that the sex partner took the medication as prescribed.

Selection bias also presents a problem in this study as follow-up was incomplete. Most patients were not retested within the recommended time frame and we have no information on those patients that did not return to clinic. This study also failed to capture any patients that may have returned to clinic more than 120 days after initial testing. Differences in behavior (i.e. sexual practices, number of partners) and reinfection risk may exist between patients that return and do not return for retesting. Patients may also have been retested at another health center. Therefore, any reduction in reinfection among patients that accepted EPT could be attributable to factors other than EPT itself.

The COVID-19 pandemic had a major impact on already strained local STI programs. A national survey revealed 78% of the STD/HIV health department workforce were redeployed to COVID-19 response for any period of time.[19] Twenty percent of STD directors reported program operations were completely disrupted and unable to function as a result of the pandemic.[19] This site was no exception; clinic closures began mid-March 2020 as resources were diverted to COVID-related activities. Limited clinic capacity coupled with stay-at-home orders negatively affected access to care, decreased visits, and, consequently, diagnosed cases of STIs. In this study, return rate decreased by 4.8 percentage points in the COVID period (17.6%) compared to the baseline period (22.4%), an overall 21.5% reduction in return visits for patients with positive STI results. Patients without symptoms were frequently deferred as symptomatic patients or known contacts to STIs were given priority. There is concern for missed infections due to decreased asymptomatic screening. We also cannot discount potential change in sexual behavior

(i.e. frequency of sex and number of sexual partners), resulting from the pandemic. The pandemic exacerbated existing public health challenges, while also highlighting the importance of convenient partner management strategies such as EPT.

Clinical impact of EPT, defined as reinfection rate in this study, is ultimately a difficult outcome to assess. Patients with positive STI results at follow-up are assumed to be reinfected, however, routine STI tests cannot reliably distinguish between reinfection from an old partner, treatment failure, and new exposure to the same STI.[20] Additionally, unique patients with more than one visit resulting in a positive test were treated as independent in the analysis, but these visits are likely related in some way. Lastly, the study population may not be generalizable to other areas or clinic types.

Conclusions

Public health departments play a vital role in the STI epidemic response. To date, efforts to address STIs have been "insufficient and fragmented."[31] To successfully combat this epidemic, clinicians must be willing to use all available tools in the arsenal. Expedited partner therapy is considered a standard of practice by the CDC. This exploratory analysis suggests that EPT is a valuable tool for preventing reinfection in patients diagnosed with STIs – a finding consistent with the results of previous randomized controlled trials.[3,10]

Local health departments cannot, however, singlehandedly address the STI problem. A coordinated, community-level response is required. Health department outreach to medical providers treating STIs may promote EPT use and even have a population-level impact on CT and GC infections.[34] Of course, EPT is not the only solution. The 2021-2025 STI National

Strategic Plan calls for employment of all feasible STI prevention strategies.[31] Additionally, we must address health inequities and the social determinants of health which perpetuate stigma and drive the STI epidemic.[31]

This study could be replicated in the future. A longitudinal study with a larger sample size would better evaluate the impact of EPT on STI reinfection rates and, potentially, the overall community burden of STIs. In the meantime, process improvement projects should involve identification of target populations, increasing patient and provider uptake of EPT, and improving retest rates to better evaluate STI reinfection. Accurate reporting and surveillance of STIs is essential to ensuring the long-term success and sustainability of this EPT policy.

Tables/Figures

Table 1

Recommended EPT Medication Regimens at the time of implementation[10]

Partners of Patients diagnosed with Chlamydia	Partners of Patients diagnosed with Gonorrhea	Partners of Patients diagnosed with Trichomonas
Azithromycin 1g PO in a single oral dose	Cefixime 400mg PO plus azithromycin 1g PO in a single oral dose	Metronidazole 2g PO in a single oral dose

References

1. Centers for Disease Control and Prevention. *Sexually transmitted disease surveillance 2018.* Atlanta, GA: US Department of Health and Human Services, 2019.

2. Kreisel KM, Spicknall IH, Gargano, JW, et al. Sexually transmitted infections among US women and men: Prevalence and incidence estimates, 2018. *Sex Transm Dis*. 2021; 48(4): 208-214.

3. Ferreira A, Young T, Mathews C, et al. Strategies for partner notification for sexually transmitted infections, including HIV. *Cochrane Database Syst Rev.* 2013; 10:1-108.

4. Barrow RY, Ahmed F, Bolan GA, et al. Recommendations for providing quality sexually transmitted diseases clinical services, 2020. *MMWR Morb Mortal Wkly Rep.* 2020; 68(5):1-20.

5. Jamison CD, Chang T, Mmeje O. Expedited partner therapy: Combating record high sexually transmitted infection rates. *Am J Public Health.* 2018; 108(10): 1325-1327.

6. Fung M, Scott KC, Kent CK, et al. Chlamydial and gonococcal reinfection among men: A systematic review of data to evaluate the need for retesting. *Sex Transm Infect.* 2007; 83(4): 304-309.

7. Hosenfield CB, Workowski KA, Berman S, et al. Repeat infection with chlamydia and gonorrhea among females: A systematic review of the literature. *Sex Transm Dis.* 2009; 36(8): 478-489.

8. Workowski KA, Bolan GA. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Morb Mortal Wkly Rep.* 2015; 64(3): 1-137.

9. Kissinger P, Hogben M. Expedited partner treatment for sexually transmitted infections: An update. *Curr Infect Dis Rep.* 2011; 13(2): 188-195.

10. Centers for Disease Control and Prevention. *Expedited partner therapy in the management of sexually transmitted diseases.* Atlanta, GA: US Department of Health and Human Services, 2006.

11. National Coalition of STD Directors. *Expedited partner therapy: Growing policy and practice.* https://www.ncsddc.org/wp-content/uploads/2017/08/florida_ept_2015.*pdf.* Published 2015. Accessed March 11, 2021.

12. Kerns JL, Jones HE, Pressman EJ, et al. Implementation of expedited partner therapy among women with chlamydia infection at an urban family planning clinic. *Sex Transm Dis.* 2011; 38(8): 722-726.

13. Mickiewicz T, Al-Tayyib A, Thrun M, et al. Implementation and effectiveness of an expedited partner therapy program in an urban clinic. *Sex Transm Dis.* 2012; 39(12): 923-929.
14. Stephens SC, Bernstein KT, Katz MH, et al. The effectiveness of patient-delivered partner therapy and chlamydial and gonococcal reinfection in San Francisco. *Sex Transm Dis.* 2010; 37(8): 525-529.

15. United States Census Bureau. *American Community Survey 1-year estimates.* https://censusreporter.org/profiles/05000US37119-mecklenburg-county-nc/. Published 2019. Accessed March 11, 2021.

16. ONE Charlotte Health Alliance. *2019 Mecklenburg County Community Health Assessment.* https://www.mecknc.gov/HealthDepartment/HealthStatistics/Documents/Mecklenburg%20CHA%202019.pdf. Published 2019. Accessed March 11, 2021.

17. North Carolina Department of Health and Human Services. *2018 North Carolina STD surveillance report.* https://epi.dph.ncdhhs.gov/cd/stds/figures/std18rpt_02102020.pdf. Published August 2019. Accessed March 11, 2021.

18. Schillinger JA, Gorwitz R, Rietmeijer C, et al. The expedited partner therapy continuum: A conceptual framework to guide programmatic efforts to increase partner treatment. *Sex Transm Dis.* 2016; 43(1): S63-S75.

19. National Coalition of STD Directors. *COVID-19 & The State of the STD Field: Phase II.* https://www.ncsddc.org/wp-content/uploads/2020/08/STD-Field.Survey-Report.II.Final-8.6.20.pdf. Published August 6, 2020. Accessed March 8, 2021.

20. Nemeth SV, Schillinger JA. Overcoming the challenges of studying expedited partner therapy in the real world. *Sex Transm Dis.* 2019; 46(10): 693-696.

21. McCool-Myers M, Smith AD, Kottke MJ. Expert interviews on multilevel barriers in implementing expedited partner therapy for chlamydia. *J Public Health Manag Pract.* 2020; 26(6): 585-589.

22. Cuffe KM, Gift TL, Kelley K, et al. Assessing partner services provided by state and local health departments, 2018. *Sex Transm Dis.* Published online November 3, 2020. doi: 10.1097/olq.0000000000001328

23. Wong J, Zakher B, Consolacion T, et al. Facilitators and barriers to expedited partner therapy: Results from a survey of family physicians. *Sex Transm Dis.* 2020; 47(8): 525-529.

24. Carman-McClanahan M, McCool-Myers M. Guidance on expedited partner therapy: A content analysis of informational materials for providers, pharmacists, patients, and partners. *Sex Transm Dis.* 2020; 47(2): 136-142.

25. Cramer R, Leichliter JS, Stenger MR, et al. The legal aspects of expedited partner therapy practice: Do state laws and policies really matter? *Sex Transm Dis.* 2013; 40(8): 657-662.

26. Centers for Disease Control and Prevention. *Legal status of Expedited Partner Therapy (EPT)*. https://www.cdc.gov/std/ept/legal/default.htm. Published May 11, 2020. Accessed March 14, 2021.

27. Guttmacher Institute. *Partner treatment for STIs.* https://www.guttmacher.org/state-policy/explore/partner-treatment-stis#. Published March 1, 2021. Accessed March 14, 2021.

28. Kumar S, Chesson H, Spicknall H, et al. The estimated lifetime medical cost of chlamydia, gonorrhea, and trichomoniasis in the United States, 2018. *Sex Transm Dis.* 2021; 48(4): 238-246.

29. Gift TL, Kissinger P, Mohammed H, et al. The cost and cost-effectiveness of expedited partner therapy compared with standard partner referral for the treatment of chlamydia or gonorrhea. *Sex Transm Dis.* 2011; 39(11): 1067-1073.

30. Rein DB, Kassler WJ, Irwin KL, et al. Direct medical cost of pelvic inflammatory disease and its sequelae: Decreasing, but still substantial. *Obstet Gynecol.* 2000; 95(3): 397-401.

31. US Department of Health and Human Services. 2020. *Sexually Transmitted Infections National Strategic Plan for the United States: 2021-2025.* Washington, DC.

32. Cornelius J, Chang T, Mmeje D. Expedited partner therapy: Combatting record high sexually transmitted infection rates. *Am J Public Health.* 2018; 108(10): 1325-1327.

33. Golden MR, Kerani RP, Stenger M, et al. Uptake and population-level impact of expedited partner therapy (EPT) on chlamydia trachomatis and Neisseria gonorrhoeae: The Washington state community-level randomized trial of EPT. *PloS Med.* 2015; 12(1): e1001777. Available from: https://www.ncbi.nlm.gov. Accessed March 7, 2021.