




Evaluation of Strategies to Improve Uptake of Expedited Partner Therapy for *Chlamydia trachomatis* Treatment in Minnesota: A Decision Analytic Model

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Abstract

Background. Despite the established effectiveness of expedited partner therapy (EPT) in partner treatment of bacterial sexually transmitted infections (STI), the practice is underutilized. **Objective.** To estimate the relative effectiveness of strategies to increase EPT uptake (numbers of partners treated for chlamydia). **Methods.** We developed a care cascade model of cumulative probabilities to estimate the number of partners treated under strategies to increase EPT uptake in Minnesota. The care cascade model used data from clinical trials, population-based studies, and Minnesota chlamydia surveillance as well as in-depth interviews of health providers who regularly treat STI patients and a statewide survey of health providers across Minnesota. **Results.** Several strategies could improve EPT uptake among providers, including facilitating treatment payment (additional 1,932 partners treated) and implementing electronic health record reminders (additional 1,755 partners treated). Addressing concerns about liability would have the greatest effect, resulting in 2,187 additional partners treated. **Conclusions.** Providers expressed openness to offering EPT under several scenarios, which reflect differences in knowledge about EPT, its legality, and potential risks to patients. While addressing concerns about provider liability would have the greatest effect on number of partners treated, provider education and procedural changes could make a substantial impact.

Highlights

- Addressing provider concerns about expedited partner therapy (EPT) legality and its potential risks would result in the most partners treated for chlamydia.
- EPT alerts and electronic EPT prescriptions may also streamline partner treatment.
- Provider education about the legality of EPT and its potential risks and training in counseling patients on EPT could also increase uptake.

Keywords

expedited partner therapy, sexually transmitted infections, decision analysis

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Chlamydia trachomatis is the most common sexually transmitted infection (STI) in the United States.¹ Despite effective antibiotic treatment, chlamydia rates have continued to rise.² While screening and timely treatment can prevent serious reproductive health outcomes, STI patients risk reinfection if their partners remain untreated.³

One effective approach for reaching the partners of diagnosed cases is expedited partner therapy (EPT).⁴ With EPT, diagnosed patients are provided antibiotic treatment or a prescription to give to their partner. This approach is effective in reaching partners who are unlikely or unable to seek treatment.⁵ However, EPT implementation is inconsistent across practices and providers, even among those providers most likely to see STI patients.⁶

There are multiple barriers to EPT provision along the continuum of STI treatment. These include legal, logistical, and financial barriers that affect all steps from the initial consultation between a provider and an STI patient up to treatment delivery by the partner and partner treatment adherence.⁷ Most EPT studies have focused on barriers and strategies to reach specific populations, rather than policy-focused strategies to increase EPT provision.⁵ Evaluations of policy-level interventions may only address one aspect of EPT, such as EPT legalization or expanding access to treatment.^{8,9} One potential concern is that EPT provision could reduce STI screening among partners.

We sought to identify which policy-level strategies could have the greatest impact on STI partner treatment in Minnesota. Decision analytic approaches can be used

to model the potential outcomes of various decisions to determine the optimal course of action. We developed a decision analytic model of the STI treatment care cascade to estimate how strategies addressing EPT barriers might increase partner treatment for chlamydia.

Methods

We based our care cascade model on Schillinger's expedited partner therapy continuum⁷ (Figure 1), which reflects all the steps required for a partner of an index STI case to be treated. In our model, each person who tests positive for chlamydia is given a form of partner treatment. This includes "simple partner referral," in which the patient is advised to notify their recent sexual partners to get tested, or EPT. If the patient is offered EPT, they receive a partner prescription or direct medication for the partner and deliver it to their partner(s). If a partner receives a prescription, there is some probability that they fill the prescription. If the prescription is filled, or if medication is delivered directly, a proportion of partners adheres to the full course of treatment. If a patient refuses EPT, they receive simple partner referral.

Using the cascade model, we calculated the number of partners treated under the status quo and different policy alternatives. We multiplied the probability of partner treatment by the average number of sex partners per chlamydia patient, estimated from the National Survey of Family Growth (2017–2019)¹⁰ and Minnesota chlamydia cases in 2019.¹¹

Cascade model parameters are summarized in Table 1. We estimated the probability of partner treatment under simple partner referral using the number of partners treated per index case from published studies.¹² We calculated provider-related EPT parameters based on a 2021 survey of EPT practice and attitudes among Minnesota health care providers ($n = 623$).¹³ In the survey, 37% of providers said they regularly provide EPT, of whom 59% said they provide it as a partner prescription. These providers also reported that 62.3% of patients accept EPT when offered as direct medication and 63.3% when EPT is offered as a prescription, which was similar to findings from a study of EPT acceptance in New York.¹⁴ We assumed that patients who accept EPT from their health care provider deliver it to their partners. We estimated the probability that a partner fills a prescription and the probability that a partner adheres to the treatment course based on existing studies.^{15,16}

Policy alternatives were designed based on a mixed-methods study of EPT barriers and solutions among health providers in Minnesota.¹³ Policy alternatives

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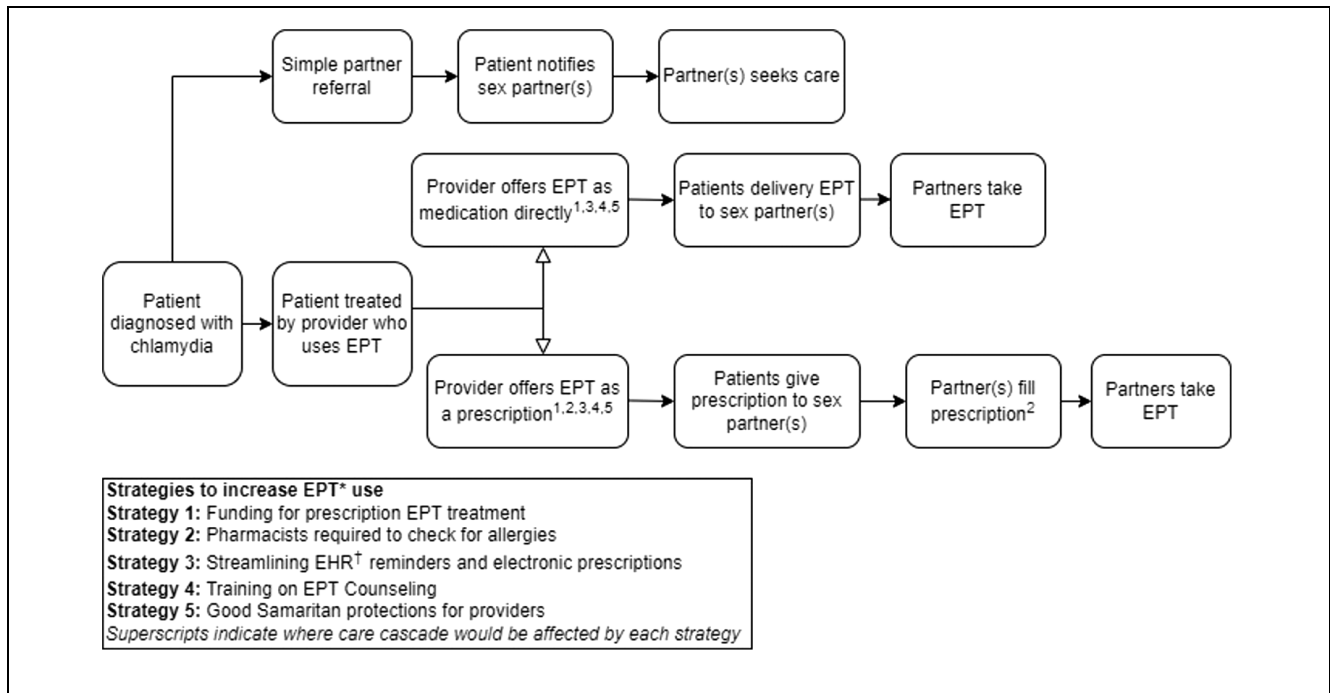


Figure 1 Care cascade diagram. Informed by Schillinger et al (2006) and Groene et al (2021). *EPT, expedited partner therapy. [†]EHR, electronic health record.

Table 1 Model Inputs

Input	Value	Source
Reported chlamydia cases in 2019	24,535	Minnesota Department of Health ¹¹
Mean number of sex partners per year among those who tested positive for chlamydia	3.33 (95% CI: 2.72–3.93)	National Survey of Family Growth (2017–2019)
Proportion of partners treated using simple partner referral (independent of EPT)	60%	Althaus et al. ¹²
Probability that a provider offers EPT		
Status quo	37%	MN [§] statewide survey results
Strategy 1: Additional explicit Good Samaritan Legal Protections afforded providers who offer EPT	60%	MN statewide survey results
Strategy 2: Funding for partner treatment when dispensed	46%	MN statewide survey results
Strategy 3: EHR alerts to offer EPT when treating an STI patient and partner prescriptions facilitated in EHR workflow	55%	MN statewide survey results
Strategy 4: Pharmacy required to check for partners' allergies when dispensing EPT	54%	MN statewide survey results
Strategy 5: Training for providers on counseling patients in EPT	48%	MN statewide survey results
Providers who give EPT as medication	41%	MN statewide survey results
Providers who give EPT as a prescription	59%	MN statewide survey results
Patients accept EPT medication for partner	62.3%	MN statewide survey results
Patients accept and delivers EPT prescription to partner	63.3%	MN statewide survey results

(continued)

Table 1 (continued)

Input	Value	Source
Probability that partner fills a prescription		
Status quo	30% (95% CI: 20.8–39.3%)	Slutsker et al. ¹⁶
Strategy 2: Funding for partner treatment when dispensed	41% (95% CI: 36.9–45.2%)	Slutsker et al. ¹⁶
Partner adheres to full treatment course	66% (95% CI: 64.3–68.3%)	Golden et al. ¹⁵

CI, confidence interval; EHR, electronic health record; EPT, expedited partner therapy; MN, Minnesota; STI, sexually transmitted infection.

included 1) additional “Good Samaritan” protections for providers offering EPT (while EPT is legally authorized in Minnesota, providers have still reported liability concerns), 2) statewide funding for partner treatment when filling an EPT prescription, 3) electronic health record (EHR) alerts to offer EPT when treating an STI patient and partner prescriptions facilitated in EHR workflows, 4) requirements that pharmacists check for allergies when filling an EPT prescription, and 5) additional training in counseling patients for EPT. We estimated how provider EPT provision would increase under each strategy based on survey responses. Strategy 2 (funding for partner treatment) also increased the probability that a partner would fill an EPT prescription by removing out-of-pocket costs. We estimated the effect of removing out-of-pocket cost barriers based on a community trial of EPT.¹⁶

We estimated the number of partners treated per index patient based on the average number of sexual partners in the past year among respondents with chlamydia in the 2017 to 2019 National Survey of Family Growth. In sensitivity analyses, we varied the average number of sexual partners from 3.33 to the 95% confidence interval of the mean (2.72–3.93).¹⁷ We also conducted sensitivity analyses varying the probability that a partner fills a prescription and the probability that a partner adheres to full treatment using the upper and lower bound of the 95% confidence interval of parameter estimates.

All calculations were conducted in Microsoft Excel (Microsoft Corporation, Redmond, WA) and SAS 9.4 (SAS Institute, Cary, NC).

Results

The expected number of partners treated in 1 y under the status quo and policy alternatives are presented in Table 2. Strategy 1 (addressing provider liability concerns) resulted in the greatest projected increase in the number of partners treated, with an additional 2,187 partners treated than under the status quo. Strategy 5 (provider

education) resulted in the least number of additional partners treated (1,059). Strategies 2, 3, and 4 resulted in 1,932, 1,755, and 1,662 additional partners treated, respectively. We also presented the results for single partner referral, which decreased relative to increases in partner treatment by EPT.

In sensitivity analyses using the upper bound of the confidence interval for the average number of sexual partners per chlamydia patient, the rank order of strategies was preserved. However, when the lower bound was used, the strategy ranking changed, with more additional patients treated under strategy 2 (funding for treatment) than all other strategies. In sensitivity analyses adopting the lower bound, additional partners treated ranged from 660 to 1,403, and in sensitivity analyses of the upper bound, additional partners ranged from 1,451 to 2,998. In sensitivity analyses varying the probability that a partner fills a prescription, the relative effectiveness of strategy 2 (funding for treatment) compared with other strategies was increased when the lower bound of the confidence interval was used and decreased when the upper bound was adopted. Sensitivity analyses varying the probability that a partner adheres to full treatment did not change the ranking of strategies, and the range of additional partners treated under each strategy were 1,003 to 2,071 and 1,135 to 2,344 using the lower and upper bound estimates, respectively.

Discussion

As only 37% of Minnesota health care providers reported regularly providing EPT for STI partner treatment, opportunities exist to increase EPT provision. We built on work identifying barriers and facilitators to EPT provision by estimating how proposed policy alternatives might increase the number of partners treated.^{8,18,19} As the number of partners treated with EPT increased, partners treated in simple partner referral decreased, which could reduce the number of partners who would receive STI testing. Successful partner referral may be more

Table 2 Results

	Status Quo	Strategy 1: Additional Explicit Good Samaritan Legal Protections Afforded Providers Who Offer EPT	Strategy 2: Funding for Partner Treatment when Dispensed	Strategy 3: EHR Alerts to Offer EPT When Treating an STI Patient and Partner Prescriptions Facilitated in EHR Workflow	Strategy 4: Pharmacy Required to Check for Partners' Allergies when Dispensing EPT	Strategy 5: Training for Providers on Counseling Patients in EPT
No. of partners treated	19,757	21,944	21,689	21,511	21,418	20,816
No. of partners treated through simple partner referral	12,425	10,112	11,469	10,570	10,668	11,306
Proportion of providers offering EPT, %	37	60	46	55	54	48
No. of additional partners treated (v. status quo)		2,187	1,932	1,755	1,662	1,059
Sensitivity analysis 1: Average number of sexual partners per patient (95% CI of number of mean sexual partners)						
<i>Outcome: No. of additional partners treated (v. status quo)</i>						
Lower bound		1,363	1,403	1,093	1,035	660
Upper bound		2,998	2,452	2,405	2,278	1,451
Sensitivity analysis 2: Probability that a partner fills a prescription (95% CI)						
<i>Outcome: Additional partners treated (v. status quo)</i>						
Lower bound		1,767	2,234	1,417	1,342	855
Upper bound		2,613	1,631	2,096	1,985	1,265
Sensitivity analysis 3: Probability that a partner adheres to full treatment (95% CI)						
<i>Outcome: Additional partners treated (v. status quo)</i>						
Lower bound		2,071	1,857	1,662	1,574	1,003
Upper bound		2,344	2,032	1,880	1,781	1,135

CI, confidence interval; EHR, electronic health records; EPT, expedited partner therapy; STI, sexually transmitted infection.

effective at only treating those partners who are positive for chlamydia, but EPT has the potential to reach more partners who would not otherwise seek testing and treatment.

Strategy 1 (addressing provider concerns about liability) was the most effective strategy in increasing the number of partners treated. While EPT is already legally permissible in 46 states and the practice has been legal in Minnesota since 2008, the greatest proportion of providers were in favor of additional legal protections.^{13,20} This may indicate a need for increased provider education about EPT's legality. Providers may also seek explicit protections for treating a partner not seen in medical consultation due to an increasingly litigious healthcare context. Opportunities exist to improve provider education on existing legal protections.

We did not estimate implementation costs, although some strategies may be more easily estimated. For example, costs for strategy 5 (provider education on EPT counseling) could be estimated based on other provider training programs. Costs for strategy 2 (funding for partner treatment) would pay for treatment and could be estimated from the average treatment cost and the expected number of people in the program. In contrast, other strategies are based on modifications to legal and EHR systems and clinical and pharmacy guidance, which may have less well-defined costs. From the perspective of a local health department, strategies 2 and 5 may be more straightforward to implement and fund, whereas other strategies would require engagement with legal and information technology systems and clinical practice across multiple health systems.

The study has several limitations. We assume that patient behavior in clinical and community trials is representative of the Minnesota population. We also assume that partner treatment treats all current sexual partners, which may be an overestimate. However, further research on acceptability of and adherence to EPT in different contexts and populations is needed. We considered policy alternatives only individually, but these policies could be combined, although the impacts are likely not additive.

Conclusion

Facilitating access to partner treatment by improving provider education on EPT's legal status, directly providing partner medication to patients, or paying for medication in pharmacies would greatly increase partner treatment in Minnesota. Partner treatment could also be improved by integrating EPT into electronic workflows, pharmacy engagement, and provider training in EPT counseling.


Authors' Note


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Supplemental Material

Supplementary material for this article is available on the *MDM Policy & Practice* website at <https://journals.sagepub.com/home/mpp>.

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