



Original article

Improving Sexually Transmitted Infection Results Notification via Mobile Phone Technology



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ABSTRACT

Purpose: To improve adolescent notification of positive sexually transmitted infection (STI) tests using mobile phone technology and STI information cards.

Methods: A randomized intervention among 14- to 21-year olds in a pediatric emergency department (PED). A 2 × 3 factorial design with replication was used to evaluate the effectiveness of six combinations of two factors on the proportion of STI-positive adolescents notified within 7 days of testing. Independent factors included method of notification (call, text message, or call + text message) and provision of an STI information card with or without a phone number to obtain results. Covariates for logistic regression included age, empiric STI treatment, days until first attempted notification, and documentation of confidential phone number.

Results: Approximately half of the 383 females and 201 males enrolled were ≥18 years of age. Texting only or type of card was not significantly associated with patient notification rates, and there was no significant interaction between card and notification method. For females, successful notification was significantly greater for call + text message (odds ratio, 3.2; 95% confidence interval, 1.4–6.9), and documenting a confidential phone number was independently associated with successful notification (odds ratio, 3.6; 95% confidence interval, 1.7–7.5). We found no significant predictors of successful notification for males. Of patients with a documented confidential phone number who received a call + text message, 94% of females and 83% of males were successfully notified.

Conclusions: Obtaining a confidential phone number and using call + text message improved STI notification rates among female but not male adolescents in a pediatric emergency department.

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IMPLICATIONS AND CONTRIBUTION

Communicating sexually transmitted infection (STI) results in an emergency department setting is a challenge. The addition of text messaging and confidential phone number documentation in the medical record is an effective method to notify STI-positive adolescent females regarding their results. Institutions can adapt these interventions to improve STI care.

In the United States, 15- to 24-year olds represent half of all newly acquired sexually transmitted infections (STI), and high STI rates are seen among pediatric emergency department

(PED) patients at many institutions [1–3]. Previous literature has shown that communication of positive STI test results to adolescents subsequently improved self-reported future

Clinical trial information can be obtained from www.clinicaltrials.gov (Improving sexually transmitted infection (STI) results notification and partner services; NCT01938053).

Conflicts of Interest: none.

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condom use, abstinence rates, and partner notification [4,5]. However, women treated empirically with antibiotics but unaware they tested positive for STIs did not change their behavior [6]. This suggests that interventions, including improved notification of test results, are needed to decrease adolescent STI rates [7].

Despite national guidelines for STI control and treatment, emergency department (ED) clinical practices related to diagnosis, treatment, and prevention of STIs among adolescents are suboptimal [8,9]. Often, those who have positive STI results untreated at the time of testing are lost to follow-up and remain untreated [10]. Additionally, many who test positive and were empirically treated in the ED are not routinely notified regarding their positive STI results. These deficiencies in clinical practice are often driven by barriers to effectively communicate STI results to patients. Historically, in our institution, less than half (45%) of STI-positive (gonorrhea [GC], chlamydia [CT], or trichomoniasis [trich]) female ED patients were notified and treated within 7 days [11]. With our previous interventions to improve electronic medical record (EMR) documentation of a confidential phone number, the distribution of STI patient information cards with a phone number to call for test results, and a dedicated mobile phone for STI follow-up calls, we were able to increase STI-positive female patients notified from 45% to 65% which was still suboptimal [11].

Text messaging is a promising method for communicating health-related information to adolescents as many report owning a cell phone and using text messaging [12–14]. Patients report that receiving text messages for sexual health care–related information is highly acceptable [14,15]. Although text messaging has been used increasingly in sexual health promotion, the clinical effectiveness of text messaging to communicate STI results in the United States has not been evaluated [16–18]. If text messaging is effective in improving notification of infected individuals, this contact method could lead to improved patient outcomes including decreasing rates of overtreatment and increasing rates of appropriate treatment. ED physicians routinely overtreat patients for STI infections fearing they will be lost in follow-up [19]. To assure appropriate treatment, it is necessary to first assure that one can be contacted in follow-up to provide the appropriate prescription or appointment necessary to receive treatment. This in turn may contribute to decreasing the prevalence of STIs and the cost of overtreatment and secondary clinical complications related to STIs [20,21].

The specific aim of this study was to test the effectiveness of PED system interventions, including mobile phone call and texting technologies and STI information cards, in improving notification of positive STI (GC, CT, or trich) test results among adolescents.

Methods

Study design

This study was a planned experiment with a 2 × 3 factorial design. Factorial design has been used successfully in health care research for improving complex processes and was chosen over the classic randomized controlled trial, because it is an efficient methodology for studying the effect of multiple components of an intervention (factors) on an outcome and providing estimates of interaction effects [22,23].

Because our previous work had focused on female adolescents, and they have significant risk for complications associated with untreated STIs, this study was initially done among females. We then obtained additional funding and included the male population in a second study using the same study design. Both studies are presented in this article.

Based on our previous work, we anticipated that two factors may have an impact on result notification [11]. The first factor was the method of contact which included call, text message, or call + text message. The second factor was an STI patient information card given at the time of the PED visit consisting of two versions. Both versions (card 1 and 2) indicated that the patient was tested for STIs and would be notified of positive results. Card 2 also included a mobile phone number to call for results between 9 A.M. and 5 P.M.

Figure 1 depicts the experimental design. The method of notification was randomized at the patient level when the tests were result after the patient visit. Because the card was a system-level intervention that was distributed by the health care provider at the time of the visit, randomization at the patient level was not feasible. Thus, we randomized the type of card to one of two blocks of time. As a result, the type of card would have been confounded with time. Thus, we repeated the experimental design (replications 1 and 2). Each intervention combination was tested until a sufficient sample size was obtained for each gender. The study was submitted to the Institutional Review Board at Cincinnati Children’s Hospital Medical Center, determined to not be human subjects research, and exempt from further institutional review board review.

Based on preliminary data, we anticipated that over a 12-month time, approximately 400 females and 245 males would test STI positive. For the female population, a sample size of 420 would result in 70 patients receiving each of the six intervention combinations and 140 receiving each of the three contact methods. From our previous female studies, we anticipated that we would be able to improve the percentage of

A

STI Information Card:			STI Information Card:		
With an ED phone number	Without an ED phone number		With an ED phone number	Without an ED phone number	
Method of Notification:			Method of Notification:		
B	T	C	B	T	C
Apr 2011 - Jul 2011			Jul 2011 - Nov 2011		
← Replication 1 →			← Replication 2 →		
Nov 2011 - Mar 2012			Mar 2012 - Aug 2012		

B

STI Information Card:			STI Information Card:		
With an ED phone number	Without an ED phone number		With an ED phone number	Without an ED phone number	
Method of Notification:			Method of Notification:		
C	T	B	C	T	B
Jul 2011 - Feb 2012			Feb 2012 - Sep 2012		
← Replication 1 →			← Replication 2 →		
Sept 2012 - Apr 2013			Apr 2013 - Jun 2013		

Figure 1. Experimental design; (A) females and (B) males. B = both call and text message; C = call; T = text message.

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