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Original article

## Parent Preferences for Communicating With Their Adolescent's Provider Using New Technologies


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 A B S T R A C T

**Purpose:** Because adolescents make few health care visits, we assessed the views of parents of adolescents on various means to communicate with their adolescents' physicians about vaccine reminders and appointments, medication refills and test results—including phone, mail, e-mail, text messages, and personal health records (PHRs).

**Methods:** We performed a cross-sectional survey of 400 parents of adolescents presenting to four pediatric offices (two urban, two suburban) in Rochester, NY in 2011 before vaccine reminders occurring in these practices.

**Results:** Roughly half of parents (60% urban, 52% suburban,  $p = .11$ ) were accepting of teens receiving their own vaccine reminders. Urban parents preferred communicating with the provider via telephone, whereas suburban parents preferred e-mail for most issues and a PHR for receipt of test results. In adjusted analyses, being younger was associated with preferring text message vaccine reminders (41 to <51 years: adjusted relative risk [aRR] = .8,  $p = .02$ ;  $\geq 51$  years, aRR = .5,  $p < .001$ ), and being a suburban parent was associated with preferring e-mail reminders (aRR = 1.6,  $p < .001$ ). Those who were younger (41 to <51 years: aRR = .6,  $p = .007$ ;  $\geq 51$  years: aRR = .4,  $p < .001$ ) and suburban (aRR = 2.4,  $p < .001$ ) were most likely to be interested in general use of a PHR.

**Conclusions:** Our study shows that some, but not all, parents are ready for electronic (text message, e-mail, PHR) communications for their adolescents' health care and that a parent age and socioeconomic divide exists. Providing options in the means in which parents communicate with an adolescent's provider is ideal.

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 IMPLICATIONS AND CONTRIBUTION

Young parents of adolescents are most likely to accept text message vaccine reminders; suburban parents prefer e-mail reminders. Personal health records are accepted generally by those parents who are younger and suburban. Communication with parents of adolescents should be customized based on parent preference.

Despite recommendations by many professional organizations for adolescents to receive annual preventive visits, only 34%–50% [1,2] actually do so. Rates of one-dose adolescent vaccinations are high nationally, but vaccines that require booster doses, such as

human papillomavirus vaccine, have low rates of completion. In 2013, only 38% [3] of adolescent females had received three doses of the vaccine, and prior studies have shown more than 50% of those who initiate the series receive subsequent doses later than recommended [4]. Adolescents also make far fewer visits of any kind to primary care compared with younger children, providing few opportunities to deliver preventive services outside scheduled preventive visits [5]. Experts have recommended reminder-recall to improve adolescent vaccination rates (and other preventive services) [6]. Reminder-recall using traditional methods,

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**Conflicts of Interest:** The authors have no conflicts of interest to disclose.

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such as mail, telephone, and autodialer has been shown to be effective in several settings to increase rates of preventive visits and completion of vaccine series for both young children and adolescents [7–9], although changing telephone numbers [10] and addresses [11], particularly for adolescents, are a challenge. Thus, we are far from our national goals of having all adolescents receive comprehensive preventive health care.

New technologies provide an opportunity to improve adolescent preventive services—including reminders using newer modalities (e.g., text messages and e-mail), personal health records (PHRs) linked to electronic health records (EHRs), and social networking sites such as Facebook. However, little is known about the degree to which parents of adolescents would prefer these newer technologies for communication with a health care provider. Text messaging has recently shown promise in a low income, urban sample as an effective means to increase immunization rates among children and adolescents [12–14]. However, it remains unclear whether this method would be feasible or effective in other populations. PHRs allow consumers access to their appointments, medications, and laboratory results, and PHRs integrated with a health care organization's EHR are becoming more popular. Overall, although a few studies [15–18] have begun to explore the use of new technologies to improve child and adolescent preventive services, no studies, to our knowledge, have assessed the views of parents of adolescents regarding their preferences for the use of these new technologies. We therefore surveyed parents from a variety of socioeconomic backgrounds about their preferences for different modalities for communications with their adolescent's primary care provider, focusing on vaccine reminders. We hypothesized that suburban (higher income) parents would be more likely to use e-mail than urban (lower income) parents [19] and that text messaging would be a more popular choice for communication among urban compared with suburban parents because nationally, lower income cell phone owners send more text messages than higher income cell phone owners [20].

## Methods

### Study design

We performed a cross-sectional survey of parents in four pediatric offices (two urban, two suburban) in Rochester, NY. The study was approved by the institutional review board at the University of Rochester School of Medicine & Dentistry.

### Sample

We used an electronic survey tool (SurveyMonkey) to collect data from a consecutive sample of 200 urban and 200 suburban parents of adolescents (aged 11–17 years) who were attending any type of health care visit at their adolescents' primary care practice between March and August 2011. The survey was reviewed by three researchers and pilot tested with five urban and five suburban parents to assess its validity. Ninety-one percent of parents approached agreed to participate. Study personnel were available to assist with use of the laptop if needed. The practices included two large pediatric urban practices affiliated with academic medical centers and two private suburban pediatric practices. The practices were using personal phone or autodialer calls for reminders of appointments already scheduled but no reminders for immunizations due. A research

assistant approached parents in the waiting room of the pediatrician's office, and parents completed the survey in English on a laptop computer so that they could answer in a confidential manner. The research assistant was available to answer any questions about the survey. Participants received a \$5 gift card as incentive.

### Survey

The survey included items describing parent's use of technology (Internet, e-mail, text messaging, social networking), location and frequency of use, whether they paid additionally for text messaging, and their preferred method of communication for (1) vaccination reminders; (2) scheduling vaccination appointments; (3) obtaining medication refills; and (4) receiving laboratory results (see appendix). Parents also completed demographic information about themselves (age, gender, race/ethnicity) and their adolescent (age, gender, insurance, number of health care visits in past 12 months). In addition, we asked whether it was acceptable for the adolescent to receive their own reminder about a vaccination that is due.

### Analyses

Our sample size was sufficient to determine a 15% difference in preference for a particular type of communication with an alpha of .05 and power of 86%. We used Pearson's chi-square tests to compare responses by parent demographics; technology use; and preferences for the best mode of vaccine reminders, scheduling appointments, getting medication refills, and laboratory results. For contingency tables where 20% of the cell's expected value was <5, we used Fisher's exact test. We also used bivariate analyses to assess factors associated with preferring text message and e-mail vaccination reminders and examined factors associated with general interest in using a PHR. Finally, we used relative risk regression, using log-binomial models, to examine parent factors independently associated with the use of text message, e-mail vaccine reminders, and the general use of a PHR.

## Results

We recruited 200 urban and 200 suburban parents, with characteristics shown in Table 1. Urban parent participants were younger, more likely to accompany younger teens (because many older teens came unaccompanied to the urban clinic), be black or Hispanic, and have adolescents with public insurance, compared with suburban parents. Suburban parents were more likely to be white, have adolescents covered by commercial insurance, and use the Internet at home and access both the Internet and e-mail daily. Urban parents were more likely to use a social network, but Facebook, the most popular network, was used equally among both groups. Cell phones were ubiquitous for both urban and suburban parents, and although almost all parents used text messaging (93% urban, 96% suburban,  $p = .31$ ), only 30% were charged extra for it. PHRs were theoretically popular, particularly for scheduling appointments, sending messages to a provider, and receiving checkup reminders, with suburban parents more likely to plan to use them than urban parents (97% vs. 80%,  $p < .001$ ).

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