



Understanding the Financial Implications of Immunization Reminder/Recall in a Multipractice Pediatric Group

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ABSTRACT

OBJECTIVE: Immunization reminder/recall is widely recommended as an effective strategy for increasing vaccination rates. We examined the revenue generated from well-child visits scheduled as a result of reminder/recall activities implemented in a multipractice pediatric organization.

METHODS: Patients aged 19 to 35 months who were due or overdue for vaccines were identified from participating practices and assigned to either standard or enhanced reminder/recall activities. Participants who received standard reminder/recall were observed for the 6-week study period, and the number of appointments in which vaccines were administered was tracked. Participants who received enhanced reminder/recall were contacted up to 3 times and received a letter followed by up to 2 phone calls. Financial information associated with appointments scheduled during the study period was obtained, and revenue was calculated for each dose of vaccine administered. Reminder/recall costs were calculated and overall revenue generated was calculated.

RESULTS: We identified 3916 children who were potentially due or overdue for immunizations. After review and manual uploading of missing historical vaccines, a total of 1892 participants received the reminder/recall initiative; 942 received standard reminder/recall, and 950 received enhanced reminder/recall. One hundred eighty-two (19%) standard and 277 (29%) enhanced reminder/recall participants scheduled an appointment by the end of the study period ($P < .001$). After subtracting the cost of reminder/recall activities, an additional \$20,066 and \$20,235 were generated by standard and enhanced reminder/recall, respectively.

CONCLUSIONS: We show that conducting reminder/recall is at a minimum financially neutral, and might increase revenue generated by vaccine administration.

KEYWORDS: reminder/recall; vaccines; revenue

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WHAT'S NEW

Reminder/recall is used to notify patients who are due or overdue for immunizations, and has been shown to increase coverage rates. The financial implications of reminder/recall are largely unknown; this study assessed revenue and costs associated with a reminder/recall initiative.

VACCINES ARE RECOGNIZED as one of the most cost-effective public health measures. In the United States, childhood vaccination of each birth cohort results in net direct and indirect savings of \$14 billion and \$69 billion, respectively, and prevents 20 million cases of disease.^{1–3} Despite documented cost-benefits associated with routine vaccination, coverage levels remain below Department of Health and Human Services Healthy People 2020 goals for some vaccines.⁴ One underutilized outreach strategy

for improving immunization coverage levels is the adoption of reminder/recall systems. These systems are used to notify patients who are due (reminder) or overdue (recall) for immunizations. Various methods of contact are used and have been found to be effective. These methods include postcards, letters, personal telephone calls, automated telephone dialing systems, and text messages/smart phone applications.^{5–14} A systematic review of reminder/recall systems concluded that such systems in primary care settings are effective in improving immunization rates. The review reported that immunization coverage levels increased by 1% to 20%, depending on the type of intervention, that all types of reminders were effective,^{6–11} and that interventions using personal telephone calls were the most effective, but also the most costly.¹⁵

Although client reminder/recall systems have been routinely implemented in dental and veterinary practices and are recommended by the American Academy of

Pediatrics, the Centers for Disease Control and Prevention Task Force on Community Preventive Services, and the National Vaccine Advisory Committee, they have yet to be widely adopted by pediatric primary care providers.^{16–19} Possible reasons for low adoption rates in primary care settings include cost and lack of staff time to conduct reminder/recall, complexity of identifying patients who are in need of reminder/recall, necessity of ensuring reminder/recall activities comply with Health Insurance Portability and Accountability Act (HIPAA), and the need for advanced planning and organization.^{19,20} Despite recent technological advances, including adoption of electronic medical records (EMRs) and participation in an immunization information system (IIS), which ease many of the difficulties of conducting reminder/recall,^{21,22} adoption rates of this important strategy remain low.²³

Despite the need to improve vaccination coverage rates across the United States and the known benefits of reminder/recall, many pediatricians report concerns that providing vaccines to children is detrimental to the financial well-being of their practices.^{24–26} Several studies have shown that vaccine purchasing costs and reimbursement rates are highly variable.^{27,28} Pediatricians who have high purchasing costs and low reimbursement rates might at best break even, or even lose money from vaccine administration.^{15,28,29} These financial stresses are compounded by seasonal variation in patient volumes, which might result in lower revenue to offset fixed operating costs. An additional overlooked benefit of reminder/recall is its ability to increase patient volumes during typically slow periods, such as during the early summer months, thus increasing the revenue generated by pediatric practices. Private practices must operate in a financially viable way, thus the potential costs and revenues of business decisions must be cautiously examined. To better understand the financial gains and losses incurred by conducting immunization reminder/recall, we conducted reminder/recall activities in a multipractice pediatric organization and examined the revenue generated from well-child and nursing visits scheduled as a result of the initiative.

METHODS

SOLICITATION OF PRACTICES AND IDENTIFICATION OF PARTICIPANTS

Practice sites were recruited in 2008 from the Texas Children's Pediatrics (TCP) network, a group of 50 pediatric practices located throughout the Greater Houston area. Participation was offered to all practice sites (41 sites in 2008) by e-mail. Student interns were hired specifically to conduct the reminder/recall initiative during the summer of 2008; all staff attended an in-person training session in which study procedures and the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices (ACIP)-recommended and catch-up immunization schedules were reviewed.³⁰ Scenario-based training incorporated was used to allow staff the opportunity to

apply their knowledge of immunization recommendations to a variety of immunization scenarios (patient fully up-to-date, patient partially immunized, patient completely unimmunized).

The immunization forecasting algorithm used by the Houston-Harris County Immunization Registry (HHCIR), the local IIS, was used to identify patients aged 19 to 35 months from participating TCP practices who were due or overdue for vaccines. In early 2008, 51% of private and 62% of public providers in the greater Houston area regularly reported vaccines administered to the HHCIR. At the time of this study, all vaccines administered by TCP providers were reported to the HHCIR through a real-time health level-7 electronic interface with TCP's billing system. Although reporting of vaccine information to an IIS is required by Texas state law (Texas Health and Safety Code Sec. 161.007(d)), resources for enforcement are lacking. Additionally, Texas IISs operate using voluntary inclusion (or "opt-in") consent procedures, requiring parents to actively complete consent documents permitting their child's vaccine information to be included in the IIS.³¹ For these reasons, provider and patient participation in HHCIR is not optimal. The forecasting algorithm uses information about previously administered vaccines and ACIP recommendations to identify vaccines recommended for administration for each patient. Patients were considered due or overdue for vaccines if they were missing any doses of ACIP-recommended vaccines for which they were age-eligible at the time the study was conducted: fewer than 4 doses of diphtheria/tetanus/acellular pertussis, 3 doses of hepatitis B, 3 doses of *Haemophilus influenzae* type b (Hib; because of the nationwide shortage during 2007–2008 and subsequent Centers for Disease Control and Prevention recommendation to defer the fourth dose,⁷ children with ≥ 3 doses Hib were considered up-to-date for the purpose of this initiative), 3 doses of polio, 1 dose of measles/mumps/rubella, 1 dose of varicella, 4 doses of heptavalent pneumococcal conjugate, and 2 doses of hepatitis A vaccines.³⁰ Vaccination records of participants identified as due or overdue for vaccines by the forecasting algorithm were manually reviewed by study staff at each of the 9 participating practices and were compared with participants' medical records. Historical vaccines documented in participants' medical records but not included in the HHCIR were added to IIS records by study staff. Inactive patients with fewer than 1 well-child or 2 sick visits in the previous 12 months and patients who were documented to have moved or gone elsewhere before reminder/recall activities began were excluded; patients who were identified as moved or gone elsewhere after contact attempts failed (letters returned as undeliverable and nonworking or reassigned telephone numbers) were included in the analysis.

Standardized tracking tools indicating which vaccines and doses should be administered were completed by study staff and placed inside all participants' medical charts. These tools incorporated the recommendations made by the forecasting algorithm into a checklist on the basis of ACIP-recommended vaccines, and included the vaccine

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