



The CAHPS Ambulatory Care Improvement Guide

Practical Strategies for Improving Patient Experience

Section 6: Strategies for Improving Patient Experience with Ambulatory Care

6.R. Reminder Systems for Immunizations and Preventive Services

To download the Guide's other sections, including descriptions of improvement strategies, go to <https://cahps.ahrq.gov/quality-improvement/improvement-guide/improvement-guide.html>.

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Section 6: Strategies for Improving Patient Experience with Ambulatory Care

6.R. Reminder Systems for Immunizations and Preventive Services

6.R. REMINDER SYSTEMS FOR IMMUNIZATIONS AND PREVENTIVE SERVICES

6.R.1. The Problem

Many patients do not receive important immunizations and other preventive services and advice because they do not know to see their clinical team for these services, they forget to make appointments, and they miss scheduled appointments. One study of family practice clinics found that the rate of missed appointments ranged widely, from close to zero to more than 50 percent.¹

The impact can be significant. Missed appointments contribute to discontinuity of care, reduce care opportunities for other patients, disrupt the patient-provider relationship, and add to health care costs.

The fact that vaccination rates for adults and children are below optimal levels supports this finding. According to the National Center for Health Statistics, in 2013:

- Less than 68 percent of adults 65 and over had had the influenza vaccine
- Less than 60 percent of adults 65 and over had been vaccinated against pneumonia.
- Only 70 percent of children aged 19-35 months had completed the full series of childhood vaccinations.²

Two common reasons for missed vaccinations are forgetting appointments and in the case of children, parents not knowing their child's immunization schedule.³

6.R.2. The Intervention

There are two useful strategies for tackling this problem:

- Reminder Systems for Patients
- Reminder Systems for Physicians

6.R.2.a. Reminder Systems for Patients

One way to tackle the inadequate delivery of preventive services is to institute reminder and recall systems for patients. Reminder systems notify patients a few days before their scheduled appointment, while recall systems contact patients who have missed appointments and encourage them to reschedule.

¹ Hixon AL, Chapman RW, Nuovo J. Failure to keep clinic appointments: Implications for residency education and productivity. *Fam Med* 1999;31(9):627-30.

² National Center for Health Statistics. Health, United States, 2014. *With Special Feature on Adults Aged 55-64*. Hyattsville, MD: 2015. Available at <http://www.cdc.gov/nchs/data/hus/hus14.pdf>. Accessed on August 4, 2015.

³ Alemi F, Alemagno SA, Goldhagen J, et al. Computer reminders improve on-time immunization rates. *Med Care* 1996;34(10 Suppl):OS45-51.

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The benefits of reminder and recall systems include improved immunization rates, fewer missed appointments (no-shows), and more preventive care visits. The higher levels of preventive services are likely to reduce morbidity and mortality from preventable diseases. Also, as more patients come for their allotted appointments, the practice can increase its visit capacity and reduce its costs, particularly those associated with the inefficient use of clinician and staff time when slots are wasted.

Reminder systems have been in use for several decades, and except for the more sophisticated computerized phone reminder systems, are not complex either to initiate or to operate. Reminder and recall systems can work through a variety of mechanisms meant to prompt the patient, including phone calls (by clinic staff, by computer, through patient portals, or through centralized programs), e-mail, text, letters, and postcards.

Systems to reduce no-shows employ some additional techniques, including:

- Reducing perceived barriers (e.g., providing transportation)
- Providing information (such as pamphlets or videos) on the importance of regular preventive and health maintenance visits⁴

Reminder, Recall, and Outreach (RRO) programs are a more resource-intensive version of these systems and have been used effectively to improve immunization rates for hard-to-reach populations, such as inner-city minority children.⁵

The Costs of Patient Reminder Systems

Barriers to implementation include cost and lack of information about the variety of systems. Costs for immunization reminder programs vary widely; for example, the cost per additional child vaccinated ranges from \$7 to \$63. Studies have found that a letter reminder system can cost \$10.50 per fully vaccinated child, whereas a comprehensive program of reminders and community outreach can cost \$63 per child per year, with an estimated cost effectiveness of \$316 per year per fully vaccinated child.⁵

The Impact of Patient Reminder Systems

Reminder and recall systems are effective at improving immunization rates in adults and children.⁵ They also reduce the no-show rate for preventive services. Increases to immunization rates ranged from 5 to 20 percent in intervention groups compared to control groups. Effectiveness was shown for adult pneumococcus, tetanus, and influenza vaccines and for childhood vaccines, including the influenza vaccine. While all types of reminder systems were effective, telephone reminders were the most effective.

⁴ Macharia WM, Leon G, Rowe BH, et al. An overview of interventions to improve compliance with appointment keeping for medical services. *JAMA* 1992;267(13):1813-7.

⁵ Szilagyi PG, Bordley C, Vann JC, et al. Effect of patient reminder/recall interventions on immunization rates: A review. *JAMA* 2000;284(14):1820-7.

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A review of studies of appointment reminder systems also found that they resulted in improvements.⁴ The rates of kept appointments increased an average of:

- 40 percent for patient contracts.
- 120 percent for letters.
- 190 percent for phone calls and for orientation/information programs (e.g., videos and pamphlets).
- 660 percent for phone reminders for psychosocial appointments.

In a study comparing the effectiveness of different approaches to improve immunization and screening, patient reminder systems were the fifth most effective method, with an average improvement of 150 percent compared to control groups.⁶ More effective were organizational change, provider reminders (see discussion below), patient financial incentives, and provider education. Less effective (but still more effective than no intervention) were patient education, provider financial incentives, and provider feedback.

6.R.2.b. Reminder Systems for Physicians

While physicians generally agree with preventive measures and guidelines, there is substantial evidence that physician compliance with such preventive measures is well below optimal.⁷ Since most patient encounters revolve around treating acute illnesses and alleviating symptoms, preventive measures are often overlooked.⁸ One way to improve compliance with such secondary tasks is to provide physicians with organized and processed data at key times.

Among physician reminders, the most prominent is the concurrent report, which offers the benefit of timeliness—i.e., it provides information to a physician at a time when she can act on it.⁹ Such reports are commonly in the form of a computer-generated printout of suggested preventive procedures that is attached to the front of a patient's chart. A common computer reminder system reviews the records of patients coming for scheduled appointments and prints out the necessary procedures and tests in the "orders" section of the encounter form.⁸

⁶ Stone EG, Morton SC, Hulscher ME, et al. Interventions that increase use of adult immunization and cancer screening services: a meta-analysis. *Ann Intern Med* 2002;136(9):641-51.

⁷ Shea S, DuMouchel W, Bahamonde L. A meta-analysis of 16 randomized controlled trials to evaluate computer-based clinical reminder systems for preventive care in the ambulatory setting. *J Am Med Assoc* 1996;3(6):399-409.

⁸ Litzelman DK, Dittus RS, Miller ME, et al. Requiring physicians to respond to computerized reminders improves their compliance with preventive care protocols. *J Gen Intern Med* 1993;8(6):311-7.

⁹ Murrey K O, Gottlieb KL, Schoenbaum SC. Implementing clinical guidelines: A quality management approach to reminder systems. *QRB Qual Rev Bull* 1992;18(12):423-33.

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Other concurrent formats include tagged notes, stickers in patient charts, and cards given to patients to help them prompt physicians.¹⁰ The type or location of the prompt does not seem to matter; that is, reminders at a variety of places in the medical chart (e.g., tagged progress note, computer monitor display) are equally as effective as a printout at the front of the patient medical record. All achieve 12 to 14 percent improvement.¹⁰

Other categories of reminders include:

- Intervisit reminders (i.e., a reminder sent to the physician after a visit when something is overdue)
- Registry reminders (e.g., an inter-visit reminder for a specific patient group, such as those with chronic condition)⁹

Implementation of Physician Reminder Systems

Prior to implementing physician reminder systems, the health care organization should address the following questions:

- Do the affected physicians believe that the services they are being reminded about are important?
- Do the physicians agree on the best approach to these issues?
- Do they agree on which steps of the process need the most support?
- Does the reminder system meet physicians' needs while also incorporating safeguards against process failures?

Failure to consider these questions is likely to undermine the success of the reminder system. It is important to note that significant rates of non-compliance with preventive procedures may indicate that there are fundamental problems with the underlying systems, which should be addressed before reminder systems are attempted.⁹

The Impact of Physician Reminder Systems

There is strong evidence from meta-analytic studies that physician reminder systems for preventive care are effective at increasing preventive procedures:^{7, 10}

- Balas et al. reviewed 33 controlled studies and found that reminder systems led to an average improvement in six preventive procedures of 13 percent, ranging from 5.8 percent for Pap smear to 17.2 percent for pneumococcal vaccination. (The other four procedures were fecal occult blood test, mammogram, influenza vaccination, and tetanus vaccination.) Extrapolating these results nationwide, the researchers estimated that reminder systems could save 8,333 lives per year.¹⁰

¹⁰ Balas E A, Weingarten S, Garb CT, et al. Improving preventive care by prompting physicians. *Arch Intern Med* 2000;160(3):301-8.

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- Shea et al. reviewed 16 randomized controlled trials and found, for six preventive practices, an overall 77 percent increase in procedures when computerized reminder systems were used.⁷
- Litzelman et al. found a 19 percent relative difference in physician compliance with reminders on three procedures when physicians were required to actively respond to a prompt by indicating the action taken, compared to a reminder that required no active response.⁸

Read More About Reminder Systems

- American Academy of Pediatrics. AAP Immunization Resources: Immunization Reminder & Recall Systems. Updated May 2014. Available at <http://www2.aap.org/immunization/pediatricians/pdf/reminderrrecall.pdf>. Accessed on August 4, 2015.
- Community Preventive Services Task Force. Guide to Community Preventive Services. Increasing cancer screening: provider reminder and recall systems. Updated February 2006. Available at www.thecommunityguide.org/cancer/screening/provider-oriented/reminders.html. Accessed on August 4, 2015.
- Community Preventive Services Task Force. Guide to Community Preventive Services. Increasing appropriate vaccination: client reminder and recall systems. Updated February 2008. Available at www.thecommunityguide.org/vaccines/universally/clientreminder.html. Accessed on August 4, 2015.
- Recommendations and Guidelines. Reminder Systems and Strategies for Increasing Vaccination Rates <http://www.cdc.gov/vaccines/recs/reminder-sys.htm>.
- Arditi C, Rège-Walther M, Wyatt JC, et al. Computer generated reminders delivered on paper to healthcare professionals; effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2012(12):CD001175.