

# Vaccination of High-Risk Patients for Influenza

## A Comparison of Telephone and Mail Reminder Methods

Ronald Brimberry, MD  
Little Rock, Arkansas

*During the 1984-1985 influenza season two study groups were used to compare telephone and letter reminder methods with a control group that received no reminder to determine which was the most effective strategy to increase influenza vaccination rates among the high-risk patient population of a university-based family practice. Seven hundred eighty-seven high-risk patients were randomly assigned to one of the three study groups: a mailed-reminder group, a telephone-reminder group, and a control group. Vaccination rates for both reminder methods were significantly higher than for the control group ( $P < .02$ ), and if successfully contacted, the telephone-reminder group had a significantly better vaccination rate than the mailed-reminder group ( $P < .05$ ). If successful telephone contact can be made, this reminder method is more effective than a letter reminder to increase influenza vaccination rates among high-risk patients.*

The prevention of influenza infection and its attendant risks by annual vaccination of high-risk groups continues to be a major public health concern. In 1984 the Immunization Practices Advisory Committee of the Centers for Disease Control (CDC)<sup>1</sup> revised its recommendations for vaccination by classifying the previously defined high-risk groups on the basis of priority. Of highest priority for vaccination were "adults and children with chronic disorders of the cardiovascular or pulmonary systems that are severe enough to have required regular medical followups or hospitalizations during the preceding year," and "residents of nursing homes and other chronic-care facilities." Of high priority are "medical personnel who have extensive contact with high-risk patients," as a reasonable effort to avoid nosocomial infection. In addition, high priority should be given to vaccination of "otherwise healthy individuals over 65 years of age" and "adults and children with chronic metabolic diseases (including diabetes mellitus), renal dysfunction, anemia, immunosuppression, or asthma that are severe enough to have

required regular medical followups or hospitalizations during the preceding year."

The Immunization Practices Advisory Committee also urged physicians in office practice and in clinic systems to vaccinate their high-risk patients at the time of their regular fall medical checkups and to notify those not scheduled for fall checkups to come in for influenza vaccination. Because it is estimated that only about 20 percent<sup>2</sup> of the high-risk population receives annual influenza vaccination in the United States, many efforts to improve compliance for this and other preventive health measures have been studied. Mailed reminders,<sup>3-6</sup> telephone calls, or both<sup>7,8</sup> have been shown, in most instances, to improve vaccination rates significantly. Shepard and Moseley<sup>9</sup> compared mailed vs telephone reminders and found that both methods reduced broken appointment rates in pediatric patients, but few studies have compared these two methods to improve influenza vaccination rates in high-risk adult patients.<sup>10</sup>

Prior to 1984 no data were available regarding influenza vaccination rates of high-risk patients seen at the Family Medical Center at the University of Arkansas for Medical Sciences, and no special efforts had been made to contact patients at high risk. The standard teaching practice of the clinic's attending physicians and health educator was to remind medical students and resident physicians to vaccinate their high-risk patients at the time of routine medical visits during the influenza season.

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From the Department of Family and Community Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas. Requests for reprints should be addressed to Dr. Ronald Brimberry, UAMS Slot 530, 4301 West Markham St, Little Rock, AR 72205.

At the beginning of the 1984–1985 influenza season, high-risk patients in need of influenza vaccination were identified from the active patient computer files of the Family Medical Center. These patients were enrolled in a controlled, prospective trial to compare the effectiveness of a mailed reminder with a telephone reminder for increasing the influenza vaccination rate of this high-risk group.

## **METHODS**

Using the CDC guidelines, a total of 832 patients were identified from the active patient computer files as being at high risk for influenza and its complications. Of these, 45 had already received their influenza vaccination and were not included in the study. The 787 patients who were eligible for the study were randomly assigned by computer to one of three groups. No attempt was made to group families together to receive the same method of reminder. Two hundred sixty-two patients were assigned to the control group in which no special effort was made to contact the patients. This method relied on the patient's presentation to the clinic for a periodic fall checkup or self-referral specifically for influenza vaccination and also assumed physician compliance in recommending influenza vaccination. Two hundred sixty-seven patients were sent a first-class mailed reminder, and the remaining 258 patients received a personal telephone reminder. The study period began on November 28, 1984, and was completed by March 1, 1985. To avoid bias, physicians at the Family Medical Center were not informed of the purpose or nature of the study.

Each patient in the mailed-reminder group was sent a letter emphasizing that, because of "certain medical problems (for example, diabetes or heart disease)," influenza can be a serious threat to health, and that the patient's physician had recommended that the patient be vaccinated. As a form letter was used, each patient's personal diagnosis could not be mentioned, and the signature of a designated "influenza vaccination director" was used because of the difficulty of obtaining the signature of each patient's personal physician. To make the vaccination convenient for the patient, no appointment was necessary, and the patient was informed of the cost. The letters were mailed first-class to determine by the return-to-sender postal designation how many letters were delivered to the addresses obtained from the computer files. No other means (eg, return questionnaire or follow-up telephone call) were used to ascertain how many patients in the mailed-reminder group actually received and read their letter reminder.

The patients in the telephone-reminder group were given the same information found in the letter, except that each patient's personal diagnosis was mentioned as

the medical indication for vaccination and the name of the patient's personal physician was utilized by the caller when recommending the vaccination. Questions from the patient were addressed by the caller (one of the clinic receptionists) or referred to a nurse practitioner if the caller was unable to answer questions of a medical nature. No more than two attempts were made to reach a patient by telephone, usually one call during working hours, and if unsuccessful, a second call during the evening hours after work. A standard script was used by the caller to assure that the same basic information and recommendation was given to each patient contacted.

The clinic nurses used a standard form to keep a record of all patients who received their vaccination during the study period. Informed consent was not obtained for participation in the study because the recommendation for influenza vaccination in high-risk patients is standard clinical practice and because the methods of intervention represented no apparent risk. The project was approved, and the need for informed consent was waived by the Human Research Advisory Committee of the University of Arkansas for Medical Sciences. Funding was provided by the Research and Publications Committee of the UAMS Department of Family and Community Medicine. Statistical analysis of the data obtained from the study was done by using the chi-square test.

## **RESULTS**

In Table 1 are summarized the vaccination rates for the three study groups. Of 267 letters sent to patients of the mailed-reminder group, 22 were marked return to sender, and 245 (91.7 percent) were delivered to the addresses obtained from the clinic's current computer files. Twenty-six (10.6 percent) of the 245 patients responded by being vaccinated at the clinic. The overall vaccination rate for the 267 patients in the mailed-reminder group was 9.7 percent.

In the group to be reminded by telephone, 135 patients (52.4 percent) were successfully contacted, whereas 123 (47.6 percent) could not be contacted on two separate attempts. Of those contacted, 24 (17.8 percent) came in to be vaccinated. The overall vaccination rate for the 258 patients in the telephone-reminder group was 9.3 percent.

Of the 262 patients assigned to the control group, 88 (33.8 percent) presented to the clinic for a medical visit during the study period. Ten (11.4 percent) of those who attended the clinic received influenza vaccination either because their physician recommended it or because the patient requested it. The overall vaccination rate for the 262 patients in the control group was 3.8 percent.

If overall vaccination rates for the three groups are compared, chi-square analysis shows no significant difference between the telephone-reminder group (9.3 percent) and the mailed-reminder group (9.7 percent); how-

TABLE 1. SUMMARY OF VACCINATION RESULTS FOR PATIENTS IN THE STUDY GROUPS

Group	Number Vaccinated	Overall Rate	Number of Patients Contacted	Vaccination Rate for Those Contacted
Control (n = 262)	10	3.8	88*	11.4
Mailed-reminder (n = 267)	26	9.7	245	10.6
Telephone-reminder (n = 258)	24	9.3	135	17.8

\* Patients presenting spontaneously to Family Practice Center

ever, both methods of intervention increased the vaccination rate significantly over the 3.8 percent rate seen in the control group ( $P < .02$ ).

Comparing vaccination rates of the successfully contacted patients in the three groups, the 17.8 percent vaccination rate for the telephone-reminder group is significantly higher than the 10.6 percent rate for the mailed-reminder group and for the 11.4 percent rate of the patients who presented to the clinic in the control group ( $P < .05$ ).

## DISCUSSION

There were several sources of potential bias that may have affected each group's vaccination rate. No effort was made to control for the possibility of there being more than one high-risk patient per family unit, in which case a single family may have received both methods of reminder. This problem was unavoidable because the Family Medical Center's computer files were not capable at that time of identifying high-risk patients according to family unit. The effect on vaccination compliance of this potential double contact by telephone and by mail, therefore, cannot be measured.

Outside sources of reminder, such as local media campaigns to encourage vaccination during the influenza season, may have increased vaccination rates in the general population. This influence may have increased vaccination rates in the study groups, but probably in equal fashion for all groups.

In the telephone-reminder group, each patient's personal diagnosis was mentioned by the caller as the medical indication for the patient being at high risk for influenza and therefore in need of vaccination. Also, the telephoned patient's own personal physician's name was mentioned by the caller as the health care professional who was recommending vaccination. This more personal method may have increased vaccination compliance of the telephone-reminder group over that of the mailed-reminder group, who were sent a form letter without personal diagnoses or physicians' names mentioned. On the other hand, in a study of postcard reminder cues reported by Larson et al.,<sup>4</sup> the nonpersonalized postcard-reminder group (which

received postcards similar to those received by the mailed-reminder group in the UAMS study) had a higher vaccination rate than the group whose postcard was signed by each patient's personal physician (51.4 vs 41 percent; not statistically significant). It is therefore possible that the personalization of the telephone call would have a lesser impact on vaccination compliance than would the actual content of the reminder.

Because the intent of the UAMS study was to find an effective means to increase the influenza vaccination rate of the clinic's high-risk population, it was disappointing to discover that the two methods of intervention improved the vaccination rate to less than that of the national average of 20 percent. Most other studies that have used mail or telephone reminders have achieved vaccination rates ranging from 20 to 80 percent<sup>10</sup>; but many of these practices have been employing reminder programs for several years, suggesting that vaccination rates may improve over time in patient populations that are reminded annually.<sup>6</sup>

Concurrent with the study at the UAMS Family Medical Center, a study of similar design was conducted at the University of Ottawa Family Medicine Centre by McDowell et al.<sup>10</sup> In this study the telephone reminder strategy was determined to be the most cost effective as well as the best method of increasing vaccination rates (37 vs 9.8 percent for study control group), even when up to five attempts were made to contact each patient. With five attempts, approximately 75 percent of the patients in the Canadian study's telephoned group were contacted, whereas 52 percent of the telephoned patients in the UAMS Family Medical Center study were contacted with no more than two attempts.

Although decided upon arbitrarily, the use of only two telephone attempts from the clinic receptionist in the UAMS study was to simulate what might be most feasible and reasonable for a private practice. Both studies would support further effort to make more attempts to contact patients by telephone. Not only would a higher percentage of patients be contacted, but as shown in the UAMS study, those successfully contacted by telephone had a significantly higher vaccination rate than the mailed-reminder group.

The successful contact of each individual high-risk patient is crucial to the effectiveness of any vaccination-reminder strategy. It can only be assumed that the mailed and delivered letters were actually received, read, and understood by the patients in the mailed-reminder group. It is possible that the 91.7 percent letter-delivery rate may be an overestimate of the actual number of patients in the mailed-reminder group who were successfully contacted.

The telephone-reminder strategy could be very time-consuming. If 1,000 patients were to be called, and an average of 2.5 minutes per patient were required as in the Canadian study, one nurse or receptionist would spend over 40 hours on the telephone. The cost analysis by McDowell et al showed that if an hourly salary of \$16 or less could be maintained in the telephoning effort, then the effort would be most cost effective. The hourly cost in the UAMS study was approximately \$10 per hour, and approximately 15 hours were needed to make up to two attempts to contact the patients by telephone. No formal cost analysis was done in the UAMS study, but cost effectiveness can be inferred, as the methodologies in the two studies were very similar.

No previous data for vaccination rates existed for the high-risk patient population at the Family Medical Center. It can be assumed that the vaccination rates of both methods of intervention can be compared with the 3.8 percent vaccination rate for the control group, and that this low figure approximates vaccination rates for the clinic's high-risk patients in years past. A retrospective chart review was not done to confirm this rate, but the practice used for the control group has been the standard at the Family Medical Center for many years. It is of interest that the 3.8 percent vaccination rate for the control group in the UAMS study is identical to the low vaccination rate for the two control practices that did not participate in the Canadian study of six family practices.

## CONCLUSIONS

Determining the most effective strategies to remind high-risk patients to receive their annual influenza vaccination will continue to be an important clinical research question as long as the national vaccination rate averages at or below 20 percent. In addition, the recommendations of the Immunization Practices Advisory Committee of the CDC may remain the same (as for the 1985-1986 influenza season),<sup>2</sup> or they may change and add new priority groups for recommended vaccination, as was the case in the 1986-1987 influenza season.<sup>11-13</sup> It will continue to be the role of the practicing physician to convey these vaccination recommendations to high-risk patients and to those who care for high-risk patients. As recommen-

dations change for these high-priority target groups, computerized patient files (as used in this and the Canadian study) will be of immense help in identifying those large numbers of patients who need a reminder to be vaccinated.

Despite the very low increases in vaccination rates that the two methods of intervention produced in this trial, they were, nevertheless, significantly higher than a no-reminder effort. This study supports the findings of the similar Canadian study and suggests that although potentially time-consuming, if patients can successfully be contacted by telephone, then this method of reminder seems to provide the most significant increase in influenza vaccination rates for high-risk patients in a cost-effective manner. Studying the use of the telephone-reminder method during each influenza season in the same high-risk population might prove that additional increases in vaccination rates can be achieved over a period of several years.

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