

## A Hospital-Based Influenza Immunization Program, 1977-78

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**Abstract:** An influenza immunization program on General Medicine inpatient and outpatient units immunized a greater proportion of patients than did physicians on medical subspecialty units. Many patients hospitalized with influenza and other respiratory conditions had been discharged earlier in the year or seen in outpatient clinics. Previous hospital care may be a useful marker for identifying many high-risk patients who could receive influenza vaccine in organized programs for hospital-based immunization. (*Am J Public Health* 1983; 73:442-445.)

The US Public Health Service recommends that influenza vaccine be given to high-risk individuals annually.<sup>1</sup> Except for the swine influenza immunization program in 1976, however, only 20 per cent of the high-risk population has been immunized each year.<sup>2,3</sup> Approximately 80 per cent of those who are immunized receive vaccine in the office practice setting.<sup>3</sup> Little is known about the use of influenza vaccine in hospitals; very few community and teaching hospitals have organized programs for immunizing their patients.<sup>4</sup> Twenty years ago, a national survey revealed that at least 20 to 30 per cent of those who died of pneumonia and influenza had been previously discharged from a hospital in their last year of life,<sup>5,6</sup> suggesting that previous hospital care might identify persons at increased risk for serious or fatal influenza infection. It also suggests that immunization in the

hospital setting might be a useful approach for delivering influenza vaccine to high-risk patients.

In 1976, the University of Chicago Hospitals and Clinics (UCHC) conducted a swine influenza immunization program for inpatients and outpatients.<sup>4</sup> In 1977-78, the immunization program was continued on the General Medicine (GM) but not the medical subspecialty inpatient services and outpatient clinics. This report compares the experiences on these units. In addition, the patterns of previous hospital care of persons with laboratory-confirmed A/Texas/77 influenza, pneumonia, and other respiratory illnesses are described.

### Methods

The GM immunization programs were conducted during a ten-week period beginning December 5, 1977. Following a specific protocol, nurses were instructed to offer influenza vaccine to all GM inpatients at the time of discharge. On medical subspecialty wards, immunization required a physician's written order. Immunization was closely monitored by checking program records on the wards and in the inpatient pharmacy. In the General Medicine Clinic (GMC), secretaries asked patients whether they wished to be immunized, recording the answer on a form attached to the chart. Following the same protocol, nurses were given primary responsibility for offering vaccine. Injection records kept by clinic nurses documented whether medical subspecialty clinic physicians ordered vaccine.

Evidence of previous hospital inpatient and outpatient care and recent influenza immunization was obtained from the medical records of adult patients admitted with influenza to inpatient units at both UCHC and Rush-Presbyterian St. Luke's Medical Center (RPSL). In all cases, the diagnosis was confirmed by virus isolation: a fourfold rise in complement fixation (CF) antibody titer in paired sera, or a single CF antibody titer of  $\geq 1:64$  in patients with clinical illness typical of influenza. Similar information was obtained for UCHC General Medicine patients admitted with pneumonia,

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**TABLE 1—Influenza Immunization of General Medicine Inpatients, 1977–1978**

Risk Group	All Patients*		Patients Offered Vaccine		Patients Immunized		
	No.	(%)	No.	(%)†	No.	Per Cent of All Patients	Per Cent of Patients Offered Vaccine
High risk‡	180	(63)	84	(47)	48	27	57
Chronic illness	61	(22)	22	(36)	11	18	50
No chronic illness	43	(15)	20	(46)	12	28	60
Total	284	(100)	126	(44)	71	25	56

\*Excludes patients who died (30), were transferred to another service (30), or were previously immunized (7; 2 per cent of all 351 patients).

†Per cent of patients offered vaccine in each risk group.

‡High risk conditions include chronic cardiopulmonary diseases, renal disease, diabetes mellitus and age  $\geq$  65 years. Chronic illnesses include other conditions such as alcoholism and neoplastic disease.

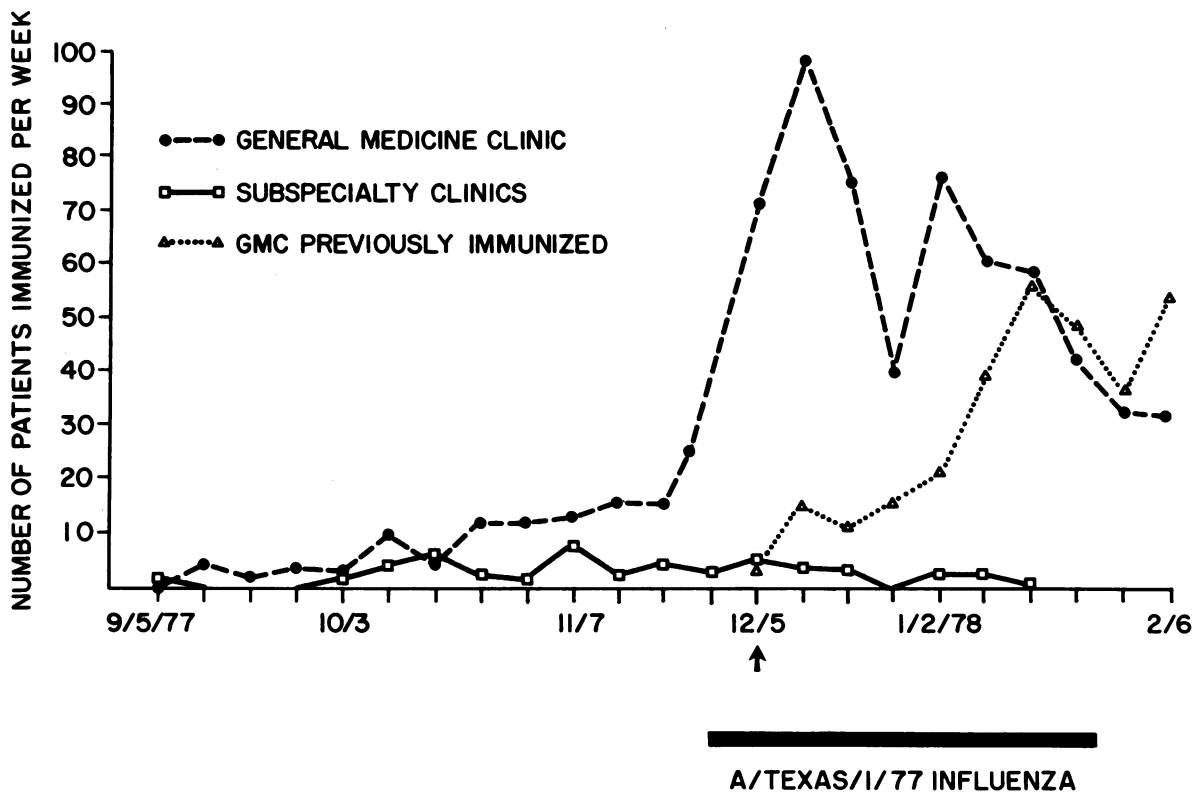
asthma, bronchitis, and chronic obstructive pulmonary disease.

### Results

On the three GM inpatient units, nurses offered influenza vaccine to 126 patients, 44 per cent of the 284 discharges (Table 1). Seventy one (25 per cent) of the discharged patients were immunized, accounting for 56 per cent of those

who were offered vaccine. Overall, there were no significant differences in the rates of offering or accepting vaccine in the three risk groups, nor among patients older or younger than 65. However, there were substantial differences in the offering rates on the three inpatient units. On one, 62 (72 per cent) of 86 patients were offered vaccine and 35 were immunized; on another, 12 (13 per cent) of 93 patients were offered vaccine, and only five were immunized.

On the seven medical subspecialty services, there was



**FIGURE 1—Number of patients immunized with influenza vaccine each week in the UCHC General Medicine Clinic and in medical subspecialty clinics. Dates indicate first day of each week. Arrow indicates beginning of the GMC immunization program. The number of GMC patients immunized declined as increasing numbers of visits were made by previously immunized patients. Data did not allow determination of the immunization rate for high-risk patients.**

**TABLE 2—Previous Hospital Care of Patients Hospitalized during the A/Texas/77 Influenza Epidemic**

Hospital and Diagnosis	Previous Hospital Care in 1977							Received Vaccine
	Patients		Inpatient Discharge		Outpatient Visit			
	Total	High Risk	Before 10/1	After 10/1	Total*	After 10/1		
UCHC and RPSL Influenza	39	34	5	10	20	17	0	
UCHC, GM Pneumonia	44	40	7	7	19	10	1	
UCHC, GM Chronic pulmonary conditions	29	29	8	6	18	16	1	
<b>TOTAL</b>	<b>112</b>	<b>103 (92)</b>	<b>20 (18)</b>	<b>23 (21)</b>	<b>57</b>	<b>43 (75)</b>	<b>2</b>	

\*Includes only patients receiving continuing care by the hospital, documented by clinic visits (excluding emergency room visits) prior to October 1, 1977.

Per cent shown in parentheses.

UCHC = University of Chicago Hospitals and Clinics

RPSL = Rush-Presbyterian St. Lukes Medical Center

GM = General Medical Service

no evidence that any of the 689 patients admitted during the study period received influenza vaccine before discharge.

In the GMC, secretaries offered influenza vaccine on 1,840 (74 per cent) of 2,492 patient visits. A 25 per cent random sample indicated that 78 per cent of patients had high-risk conditions. In all, 713 GMC patients received influenza vaccine, 126 who were immunized following physicians' orders before the program began, and 587 who were immunized by clinic nurses during the program period (Figure 1).

In medical subspecialty clinics, only 54 patients were immunized, although 2.7 times as many clinic visits were made to subspecialty clinics as to the GMC. An epidemic of A/Texas/77 influenza had no effect on the immunization practices of subspecialty clinic physicians.

Patterns of previous hospital care among patients hospitalized with influenza, pneumonia, and chronic pulmonary conditions during the epidemic period are given in Table 2. Ninety-two per cent could be classified as high-risk. Overall, 43 (38 per cent) had been discharged previously in 1977, 21 per cent within the preceding two to three months. Among patients who died, two of three with influenza and two of six with pneumonia had been discharged earlier in the year. In addition, 75 per cent of patients receiving continuing care by the hospital had recently visited an outpatient clinic. Only two of the 112 patients had received influenza vaccine.

### Discussion

The experience with the GM influenza immunization program suggests that organizational factors may be critical determinants for successful immunization. The low immunization rate in high-risk persons may not simply be due to their lack of knowledge,<sup>7</sup> health beliefs,<sup>8-11</sup> or other factors which influence immunization behavior. Physician knowledge, although necessary, may be insufficient to guarantee that patients will be offered vaccines. Two-thirds to three-fourths of all UCHC faculty and housestaff physicians possessed adequate knowledge on the use of influenza

vaccine.\* On medical subspecialty units they failed to translate their knowledge into clinical practice, even when confronted with an epidemic of influenza. In other settings, well organized programs have been responsible for high immunization rates,<sup>8,12,13</sup> although this has not always been observed.<sup>14,15</sup> In the hospital setting, substantial numbers of GM patients were immunized because there was an organized approach to offering vaccine. Its major shortcoming was the failure to offer vaccine to all patients, particularly on the inpatient units. Since 1977-78, however, experience with the GMC program has shown that almost all high-risk patients have been offered vaccine, and approximately 50 per cent have been immunized.\*\* The subspecialty clinics continue to immunize few patients.

Our experience indicates that recent hospital inpatient or outpatient care may identify many high-risk persons,<sup>16</sup> and that few medical patients admitted during influenza epidemics have received influenza vaccine.<sup>17</sup> As recently suggested for pneumococcal vaccine,<sup>18,19</sup> hospital-based immunization with influenza vaccine could also make an important contribution to the prevention of influenza. To be effective, however, it will be necessary to have organized institutional programs for offering the vaccine to high-risk patients.

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