

Missed Opportunity: Why Parents Refuse Influenza Vaccination for Their Hospitalized Children

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ABSTRACT

BACKGROUND AND OBJECTIVES: Hospitals are required to screen and administer the influenza vaccine to all admitted children unless contraindicated or refused by parents, yet vaccination rates remain low. Our goal was to examine reasons for refusal among pediatric patients admitted during influenza season.

METHODS: All children age 6 months to 18 years admitted to 2 network community hospitals from October 1, 2013 to March 31, 2014, without contraindications, were offered influenza vaccination prior to discharge. Parents who refused vaccination were asked their reason for refusal. Chi-square tests and logistic regression were used to determine factors associated with refusing the vaccine in the inpatient setting.

RESULTS: Three hundred twenty-five of 786 unique patients admitted during influenza season were eligible for vaccination. Of these, 49.8% refused. Parents of females, whites, and those with private insurance were more likely to refuse vaccination. Patients whose immunization status was otherwise up to date were more likely to accept (Odds Ratio 2.39, 95% Confidence Interval 1.05-5.41). Commonly cited reasons for refusal were: preference to have vaccination by the primary care provider (24.1%), concern for side effects (16.1%), not wanting vaccination (13%), doubt in efficacy (8%), concern that the child was already sick (6.8%), no prior influenza vaccination (6.7%) and feeling that it was not needed (5.6%).

CONCLUSIONS: Hospitalization during influenza season provides an opportunity for health-care providers to educate families about influenza and vaccinate patients if appropriate. However, nearly half of parents of eligible children declined vaccination. More study is required to determine strategies that can increase influenza vaccination acceptance.

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The influenza virus affects 20% to 30% of children worldwide annually and can lead to significant morbidity and mortality.¹ In the United States, influenza is responsible for the hospitalization of 240 per 100 000 infants <6 months old and 20 per 100 000 children ages 2 to 5 years.¹ During the 2012 to 2013 influenza season, the Centers for Disease Control and Prevention (CDC) reported 156 influenza-associated pediatric deaths, with 47% of patients having no underlying high-risk condition and 90% having no influenza vaccination.²

Multiple studies have demonstrated the safety and efficacy of influenza vaccination in children.^{3,4} Both the CDC and the American Academy of Pediatrics recommend that all children >6 months old without contraindication receive the annual influenza vaccination.^{5,6} However, only 2 states, New Jersey and Connecticut, require children age 6 to 59 months attending preschool or day care to receive the influenza vaccine, and no state requires annual influenza immunization for children >5 years old.⁷ Although the rate of uptake of other routine vaccinations of childhood is ~90%, influenza vaccination rates for children are much lower, at ~51% to 57%.^{8,9}

To further increase vaccination rates, the American Academy of Pediatrics has long advised assessment of immunization status and encouraged administering immunizations, if appropriate, at sick visits.¹⁰ Beginning in 2012, the Center for Medicare and Medicaid Services began requiring hospitals to screen patients for influenza vaccination status during influenza season and vaccinate all admitted children unless contraindicated or refused by parents.⁶

There are many studies on why health care workers decline annual influenza immunization and why parents seek exemption from administration of routine childhood vaccines.^{11,12} There is less known about why parents opt against the annual influenza vaccine for their children. Our goal was to further examine why parents of hospitalized children opt not to receive the influenza vaccine before discharge.

METHODS

Setting

This retrospective chart review was conducted at 2 suburban network

community hospitals that admit pediatric patients. The pediatrics program is affiliated with a large children's academic hospital; the 2 sites have a combined total of 21 pediatric and 6 ICU beds and on average 1900 admissions per year. The dedicated hospitalist service serves as the attending of record for 99% of patients.

Starting in the fall of 2012, the 2 hospitals implemented a policy in response to the Center for Medicare and Medicaid Services requirement to screen all children between the ages of 6 months to 18 years and offer influenza vaccination if the child was without contraindication and parents consented. To meet this goal, a flu assessment form was created that identified known contraindications to influenza vaccination and included a physician order component for vaccination if consent was obtained. There was also an area to record reason for refusal for parents who opted out. Upon completion, this form was added to the medical record. This form was unaltered for the study period: October 1, 2013, to March 31, 2014. Parents were provided with the CDC information sheet on the influenza vaccine, and the physician or nurse caring for the patient completed a pediatric influenza assessment.

Patients were excluded if they had a known contraindication for the influenza vaccination: age <6 months, age 6 months to 8 years and received a dose of vaccine <4 weeks before hospitalization, already properly immunized for current influenza season, anaphylactic reaction or severe hypersensitivity to eggs or other components of the vaccine, history of Guillain-Barré syndrome within 6 weeks of a previous vaccine, bone marrow transplant within the last 6 months, anaphylactic latex allergy, or moderate to severe febrile illness on the basis of provider clinical judgment. If the patient was without contraindication, the parent was asked if he/she would like the child to receive the vaccination before discharge.

If the parent declined vaccination, the health care provider asked the reason for refusal. Responses to this open-ended question were recorded by the physician or bedside nurse

on the influenza assessment and became part of the child's medical record. The medical record of all children between the ages of 6 months and 18 years who were admitted to these hospitals from October 1, 2013, to March 31, 2014, were reviewed for this study. Study investigators (M.A.C., H.T.) reviewed this information and categorized the responses. For patients with multiple admissions during the study period, only data from the first admission were used. This study was approved by the institutional review board with a waiver for consent.

Measures

Patient demographics were abstracted from the medical record and included age, gender, race/ethnicity, and insurance status. The majority of the sample was white (65.3%) or African American (22.9%). The remainder were Asian (2.1%), white/African American (1.8%), Indian (1.1%), Hawaiian, Samoan, Native American (<1%), and "other" (6.6%). These were then categorized as "Other" and made up 12.3% of the sample. No children were identified as Hispanic. Those without insurance, ie, Medicaid or on a Medicaid health maintenance organization (HMO), were categorized as "Medicaid/non-insured." Those with private insurance, preferred provider organizations, or HMOs were categorized as "private insurance." On admission, parents were asked whether their child's immunizations were up to date regarding routine vaccinations of childhood. A separate question asked whether the child had received the seasonal influenza vaccination. This information was recorded in the medical chart.

On admission, parents were also asked to report on the child's medical history. Because children with asthma and other chronic respiratory illnesses have higher risk for developing influenza-related complications and are commonly admitted to this community hospital system, we abstracted the pulmonary medical history for review.¹³ Those who reported that their child had a history of asthma, pneumonia, or bronchiolitis were categorized as "pulmonary history." Whether the patient was treated for asthma or a wheezing episode during that hospitalization was also

abstracted from the medical chart: those who received ≥ 1 albuterol treatments were categorized as “received treatment for asthma/wheezing.” Length of stay was calculated in days, and initial location of admission (medical floor or ICU) was abstracted from the medical chart.

As part of the influenza assessment, parents who refused influenza vaccination were asked the specific reason for refusal. This assessment was most often completed by the admitting nurse, but if not finished at admission, was completed by the physician or another nurse during hospitalization and entered into the medical chart. The patient population was predominantly English speaking. For non-English-speaking families, telephone translation services were used. Open-ended responses were recorded in the medical chart. The responses were collected for the retrospective chart review and coded by study investigators (M.A.C., H.T.). Most of the responses fell into several categories: preference to have vaccination at the primary care provider's office, concern for side effect or adverse reaction, simply not wanting vaccination, no prior influenza vaccination, concern because child is already sick, belief that it was not needed for otherwise healthy child, and wanting to wait. Several responses that did not fit into these categories were grouped together as “other.” In the rare instance that a parent reported >1 reason ($n = 3$), the first response was used for coding.

Statistical Analysis

Descriptive statistics were conducted using means and frequencies. Among those who were eligible for vaccination, χ^2 and t tests were used to compare differences between those who accepted vaccination during hospitalization and those who refused. Counts and frequencies were used to categorize the reasons for vaccine refusal. Multivariable logistic regression was used to determine factors associated with vaccine acceptance. Race/ethnicity was dichotomized into white versus other for this analysis. A P value <0.05 was used for significance in all analyses. All statistics were performed using SAS version 9.3 (SAS Institute Inc, Cary, NC).

RESULTS

There were a total of 838 admissions during the study period, representing 786 unique patients. The mean \pm SD age of children was 6.71 ± 5.71 years, and 44% were female (Table 1). The majority was white (65.3%), with 22.9% of children reported as African American and the remainder (12.3%) classified as “other.” Most had private insurance. The median length of stay was 1.65 days. Patients were most commonly admitted for asthma exacerbation (26.1%) or other respiratory diseases such as bronchiolitis, croup, or pneumonia (23.9%). Most parents (90.2%) reported that their children were up to date on routine immunizations of childhood.

Of the 786 unique patient admissions, 96.7% had a complete influenza vaccine assessments. Of these, half the parents (50.5%) stated that their child had already received an annual influenza vaccine (Fig 1). Another 4.7% had a known contraindication (eg, egg allergy [2.2%]), were judged by the health care provider to have a moderate to severe febrile illness during admission (2.4%), or had unknown influenza vaccination status (0.3%), making them ineligible for the influenza vaccination before discharge. Of the remaining 325 patients who completed the influenza assessments and were eligible for vaccination, 163 patients (50.1%) were vaccinated before discharge

TABLE 1 Demographic and patient characteristics

Characteristic	All Subjects	Declined Influenza Vaccination	Influenza Vaccination Given Before Discharge	P
n	786	162	163	
Age, y	6.71 ± 5.71	8.02 ± 6.02	7.24 ± 5.96	.29
Length of stay, d	1.65 ± 1.91	1.44 ± 1.69	1.82 ± 1.84	.05
Gender				.05
Male	55.6	44.9	55.1	
Female	44.4	55.7	44.3	
Race				$<.01$
White	65.3	55.8	44.3	
African American	22.9	40.5	59.5	
Other	12.3	29.2	70.8	
Insurance ^a				.01
Private	62.0	55.7	44.3	
Medicaid/not insured	38.0	41.2	58.8	
History of pulmonary disease ^b				$<.01$
Yes	42.5	39.5	60.5	
No	57.5	55.6	44.4	
Treatment of asthma/wheezing during this hospitalization ^c				$<.01$
Yes	33.5	38.5	61.5	
No	66.5	55.2	44.8	
Initial admission location				.99
Pediatrics	91.5	49.8	50.2	
PICU	8.52	50.0	50.0	
Immunizations up to date ^d				.02
Yes	90.2	47.8	52.2	
No	9.8	68.8	31.3	

Values are presented as mean \pm SD or % unless noted otherwise.

^a Medicaid/noninsured includes patients with Medicaid HMO.

^b Parents reported a history of asthma, pneumonia, or bronchiolitis.

^c Children who received one or more albuterol treatments during this hospitalization.

^d Based on parental report.

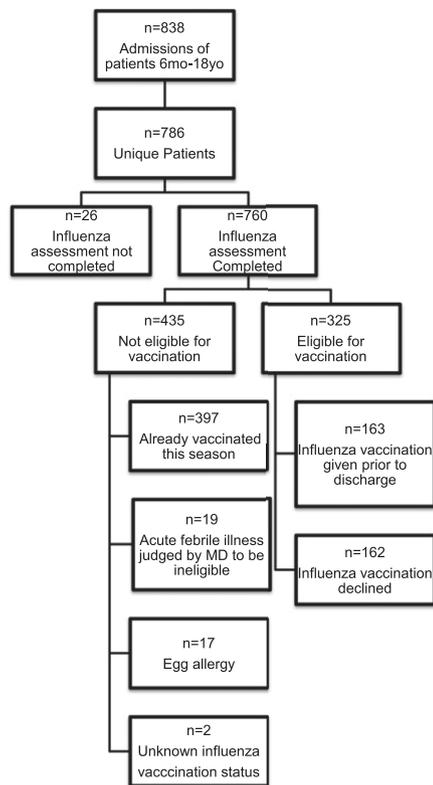


FIGURE 1 Study population.

and 162 parents (49.8%) refused the influenza vaccine for their children. Two of these parents had initially consented to vaccination but rescinded consent before administration and were included in the “refused vaccine” group.

The influenza assessment form was not completed on 26 patients (3.3%). These children were 50% white, 27% African American, and 23% other race, and 69.2% were privately insured. Only 73.1% were reported to be up to date on routine vaccinations of childhood. Because the influenza assessment sheet served as the order form for vaccination, none of these children received the influenza vaccine before discharge.

Reasons for Refusal

The most commonly cited reason for vaccine refusal was a preference to have the vaccination at the primary care provider's office (24.1%) (Table 2). Other commonly cited themes that emerged were concern for side effects or adverse

reactions (16.1%), simply not wanting the vaccine (13%), doubt of efficacy (8%), no prior influenza vaccination (6.7%), belief that it was not needed for the otherwise healthy child (5.6%), and concern that the child was already sick (6.8%). A subset of responses (14.8%) did not fall into these categories and were grouped as “other.” Responses in this category included: “child doesn't like needles,” “religious reasons,” and “too many things going on at this time.”

Factors Associated With Vaccine Refusal

Among those eligible for vaccination, girls were more likely to not receive the vaccine (55.7% vs 44.9%, $P = .05$) (Table 1). Parents of white children were also more likely to reject influenza vaccination (55.8%) compared with parents of black children (40.5%) or those classified as other race (29.2%) ($P \leq .01$). Parents of children with private insurance were more likely to refuse vaccination compared with children with Medicaid or no insurance (66.7% vs 33.3%, $P = .01$). In addition, parents of children that were not up to date on routine childhood vaccination were more likely to refuse vaccination versus those reported as up to date (68.8% vs 47.8%, $P = .02$). There was no statistically significant difference in community hospital site (Virtua Memorial versus Virtua Voorhees), length of stay, age, or unit of admission (pediatrics versus PICU) in vaccination uptake.

In terms of medical history, patients with a reported history of pulmonary disease and being treated for asthma during their hospitalization were more likely to

receive the flu vaccine before discharge ($P < .01$ for both).

All significant factors were entered into a multivariable logistic regression model to determine which factors were associated with vaccine acceptance during hospitalization (Table 3). Those with private insurance had lower odds of receiving the influenza vaccine (odds ratio [OR] 0.60, 95% confidence interval [CI] 0.37 to 0.97). On the other hand, children who were otherwise up to date on their immunizations had higher odds of receiving the vaccine before discharge (OR 2.39, 95% CI 1.05 to 5.41).

DISCUSSION

In our study, >90% of parents reported that their child was up to date on routine vaccinations, yet of those patients, only half had received their annual influenza vaccination. Of those who were eligible to receive the flu vaccine before discharge, 49.8% still refused. In the inpatient setting, parental vaccine refusal was higher for patients who were female, white, had private insurance, and reported that their routine childhood immunizations were not up to date.

Patients who were identified as African American or other race were more likely to accept influenza vaccination than whites. This difference may be somewhat explained by differences in insurance coverage: 42.6% of African Americans and 47.7% of those classified as other race had private insurance, much less than the 71.1% of whites who had private insurance. It was also interesting to note that those with a reported history of pulmonary disease as

TABLE 2 Parent reasons for declining influenza vaccination during hospitalization among eligible children ($n = 162$)

Reason	Frequency, %
Would prefer to obtain vaccine at primary care office or want to wait	25.3
Concern for adverse reaction or side effects	16.1
Do not want vaccination	13.0
Never had influenza vaccine previously or felt it was not needed for their otherwise healthy children	11.7
Do not believe it works	8.0
Child is already sick	6.8
Other	14.8
Reason not documented	4.3

TABLE 3 Multivariable analysis examining factors associated with influenza vaccination acceptance among eligible patients

Factor	OR	95% CI	P
Gender (female vs male)	0.70	0.44–1.11	.13
Insurance (private vs Medicaid)	0.60	0.37–0.97	.04
Race (African American vs white)	1.26	0.71–2.22	.43
Race (other vs white)	2.88	1.11–7.51	.03
History of pulmonary disease	1.34	0.74–2.46	.34
Received asthma treatment during this hospitalization	1.35	0.74–2.46	.35
Up-to-date immunization status	2.39	1.05–5.41	.04
Length of stay	1.11	0.97–1.26	.12

well as those treated for asthma during hospitalization were more likely to accept vaccination before discharge (60.5%). This result may be secondary to increased promotion of vaccination by medical staff to this high-risk group or potentially heightened parental concern for subsequent pulmonary infection with influenza. However, in the multivariable analysis, only those with private insurance were less likely to receive influenza immunization, whereas up-to-date immunization status was associated with greater odds of vaccination.

Our results differed from those of Pollack et al., who looked at adding automated influenza screening to the electronic health record for hospitalized children.¹⁴ They reported a much lower refusal rate (25.6%) and no statistically significant difference in uptake among whites. However, they did report decreased uptake in female patients, as we found in our study. Their study did not assess whether children were up to date on other vaccines or insurance status.

Myths and misinformation about the influenza vaccination are pervasive. In our study, commonly cited reasons for refusing the influenza vaccine included the belief that vaccination could result in infection or make their child sicker, doubts about efficacy, belief that influenza vaccination is not truly needed for otherwise healthy children, and concern for side effects. These are similar to concerns expressed in studies of health care providers themselves.¹¹ Some of these concerns are similar to those found in Pollack et al.¹⁴ Interestingly, the most commonly cited reason for refusal in their study was

“parent thinks vaccine is unnecessary” (25.2%). However, only 5.6% offered that as a reason for refusal in our study. Parents in our study were most likely to report a preference to obtain vaccination from the primary care provider (24.1%). This difference may be due to variations in demographics and region.

Other factors may also be at play, since the most commonly cited reason for refusal was a preference to receive the influenza vaccine at the primary care provider’s office. Indeed, there may be some benefit to having the influenza vaccine given by the regular provider. Families may feel more comfortable discussing the pros and cons with a known provider, and doing so ensures that the immunization record is all in one place. However, delaying vaccination has multiple disadvantages. Maximal immunity takes 2 to 4 weeks to occur, and prolonging administration during influenza season increases the window of opportunity for the patient to acquire infection.¹⁵

Furthermore, even well-intentioned parents may not follow up after hospitalization, and unfortunately, missed opportunities to vaccinate by primary care providers are not uncommon.^{16,17}

Despite our findings, there were some limitations. We relied solely on parental report for immunization status for both routine childhood and influenza vaccinations. This may not be a reliable method and may lead to overreporting of up-to-date status.¹⁸ Because 50.5% of parents reported that their child had already received an influenza vaccination this season, there may have been many parents who were not approached for

influenza vaccination because of erroneous reporting, and our reported refusal rate may underrepresent the true rate.

Although most often completed by the admitting nurse, the influenza assessment was completed by several different health care providers (both nurses and doctors). We are unsure whether the type of provider (MD or nurse) or the approach of the provider affected the rate of acceptance of the vaccine or the disclosed reasons for refusal. Also, to ensure that the flu assessment was completed before discharge, most providers completed the form on admission to the hospital, a particularly stressful time for families. We are unable to determine whether timing of the approach would have affected our vaccination rate.

Many parents offered reasons for rejection that were quite vague (“don’t want it” or “it is not needed”) without identifying a specific reason. In addition, because health care providers are generally seen as advocates for vaccination, parents may have found it difficult to offer a completely frank answer for their refusal and instead offered a more “acceptable” response, such as preference to obtain the vaccine at a later time, without any real intention of doing so. Despite these limitations, nearly 50% of parents refused vaccination, and we were able to gather information that may help inform future efforts to increase vaccination rates in the hospital.

CONCLUSIONS

Influenza can lead to significant morbidity and mortality in the pediatric patient, and our current annual vaccination rates are poor. In our study, 49.8% of parents of eligible children rejected the influenza vaccine. Parents most often cited a preference for the primary care provider to administer the vaccine. Other commonly cited reasons were the belief that vaccination could result in infection or further worsen current health status, doubts about efficacy, perception that the vaccine is not really needed, and concern about side effects.

Information and reassurance from health care providers have been shown to be the

main reason reluctant parents change their minds about vaccination.¹⁹ With vaccination as the best defense from influenza, health care providers need to take advantage of every opportunity, even inpatient stays, to educate families and advocate for vaccination. Because private insurance was associated with a higher refusal rate, efforts may need to target this group and better understand their reasons for refusal. Further studies to boost parental acceptance of vaccination are needed.

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