

# Vaccine Eligibility in Hospitalized Children: Spotlight on a Unique Healthcare Opportunity

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## ABSTRACT

**Objective:** The goals of this study were to evaluate the effectiveness of an inpatient documentation system for identifying missed vaccine opportunities and to identify parental satisfaction with their vaccination services.

**Methods:** A prospective descriptive study compared inpatient documentation of vaccine history with actual vaccine records, and adherence with the Advisory Committee on Immunization Practices guidelines was assessed. A parental satisfaction survey was administered.

**Results:** One hundred sixty pediatric patients ages 2 months to 17 years (mean age 8 years) were enrolled. Seventy-six percent of patients had documentation of vaccine history, and 92% were documented as receiving all age-appropriate vaccines. Actual immunization records showed that 16% percent of patients were in compliance with Advisory Committee on Immunization Practices guidelines. The most

commonly missed vaccine was influenza (67%) followed by meningococcal (57%), hepatitis A (48%), and varicella (38%). Ninety percent of parents were satisfied with the vaccination services their child had received.

**Conclusion:** A review of vaccine records is recommended to accurately assess status. Inpatient hospitalization represents an opportunity to assess vaccination status, address parental concerns, and provide updated vaccinations. *J Pediatr Health Care.* (2014) 28, 148-154.

## KEY WORDS

Pediatric, vaccine, validation, satisfaction

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Conflicts of interest: None to report.

Financial support was provided by a Dee Lyons Internal Nursing Grant.

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0891-5245/\$36.00

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Published online March 20, 2013.

<http://dx.doi.org/10.1016/j.pedhc.2013.01.001>

Missed opportunities are a major factor in undervaccination (*American Academy of Pediatrics [AAP], 2003*). The AAP recommends assessment of vaccination status at every health encounter as a way to further increase vaccination rates by identifying missed opportunities (*AAP, 2010*). Vaccination status and records are normally reviewed during routine pediatric clinic well child visits, but during acute illness, injury, or hospitalization, the patient's vaccination status is typically verified based only on recall by the parents. Parental recall can overestimate vaccine status. *Lyratzopoulos, Aston, Bailey, Filtcroft, and Clark (2002)* showed that 97% of parents thought their children had received the measles-mumps-rubella vaccine, but only 75% had confirmation of vaccine receipt.

Limited studies have evaluated vaccine validation in the inpatient setting, and no prior study has been conducted within the United States. *Gilbert and Wrigley (2009)* studied vaccination status in the inpatient setting in New Zealand and found that 85% of hospitalized children had vaccinations documented and 60% had verification that all age-appropriate vaccines were received. Seventy-nine percent of children who were behind on

vaccination had no follow-up action in place, and only 4% received their missing vaccines while hospitalized (Gilbert & Wrigley, 2009).

A study by Rickert, Shefer, Rodewald, and McCauley (2003) assessed whether receipt of the diphtheria tetanus acellular pertussis vaccine could be used as a marker of appropriate immunization coverage. The cross-sectional study evaluated children aged 3 to 24 months enrolled in the Women, Infants, and Children's program (Rickert et al., 2003). The study showed that being appropriately vaccinated with diphtheria tetanus acellular pertussis was not a sensitive indicator for completion of all vaccines; therefore unimmunized children cannot be identified based on this one vaccine (Rickert et al., 2003).

Incomplete vaccination coverage is influenced by parental values and culture and by both parental and provider knowledge about the importance of and necessity for vaccination. Prior studies of parental beliefs have identified vaccine safety concerns, rushed medical personnel, and long office waits as barriers to vaccination, although younger parents and parents with a child who had a chronic illness were more likely to vaccinate and did not hold the belief that children receive too many vaccines or that vaccine side effects should be feared (Fitch & Racine, 2004; Niederhauser & Startk, 2005; Taylor et al., 2002). Parental satisfaction with care correlated in one study with on-schedule receipt of age-appropriate vaccines (Schempf, Minkovitz, Strobino, & Guyer, 2007).

The goal of this study was to evaluate the accuracy of the admitting physician electronic medical record documentation of immunization history compared with the record obtained from the child's vaccine provider(s) in children admitted to a free-standing children's hospital. Vaccine on-schedule completion was assessed using the Advisory Committee on Immunization Practices (ACIP)/AAP guidelines for age. Parental satisfaction with immunization services was documented to identify potential barriers to vaccine completion.

## METHODS

### Study Design

This study was a descriptive study of inpatient vaccination documentation and parental satisfaction with the vaccinations services. Institutional Review Board approval was obtained.

### Participants

A convenience sample was obtained from hospitalized pediatric patients and their parents who received an infectious disease consultation from July 2011 to November 2011. All children between 2 months to 17 years of age were included. A convenience sample was used because immunization records are routinely obtained for patients as a part of the infectious disease consult. Immunization records for all other admissions are not rou-

tinely obtained. Exclusion criteria included any patient with an underlying contraindication to the universal vaccine schedule, including immunodeficiency or receiving chemotherapy. Neonates also were excluded because they had not yet been vaccinated in an outpatient setting; therefore the parents could not complete the satisfaction survey.

### Setting

The study was conducted at a Midwest regional children's hospital with a total of 317 inpatient beds and an average of 15,000 yearly inpatient admissions. The institution has 40 subspecialty areas, including infectious disease. The infectious disease service averages 1,100 yearly inpatient consultations consisting of all ages of pediatric patients with a variety of diagnoses, including healthy children with intercurrent infection.

### Measures and Data Collection

#### Inpatient vaccination documentation

A demographic sheet was completed, and information including age, sex, race, insurance status, and locations where the patient received all of his or her vaccines was obtained. A copy of the patient's vaccine record was reviewed if parents could provide it, and if it was not available, an interview of the patient's parent was undertaken to identify all vaccine providers. In all cases, the vaccine records from the medical home and any other vaccine providers were reviewed. Vaccine records were compared with the inpatient vaccine documentation reported in the initial history and physical. Inpatient documentation of vaccines and vaccine records were then compared with current ACIP guidelines. Vaccine status was evaluated based on age eligibility for individual vaccines. On-schedule receipt of the influenza vaccine was considered if the child had received the vaccine in the previous year if the admission occurred before the availability of the influenza vaccine for the current season. For any child who was behind on vaccines, caught-up vaccines were reported to their general inpatient team.

#### Parental satisfaction

Parental satisfaction was evaluated with the Satisfaction with Immunization Service Questionnaire (SWISQ) (Box). The SWISQ is a 19-item questionnaire developed by Tickner, Leman, and Woodcock in 2010; it uses a 5-point Likert scale to evaluate parental satisfaction with vaccination services. Content and face validity were ensured both from past literature and interviews with parents (Tickner, Leman, & Woodcock, 2010). Reliability was established with internal consistency of the three subscales (organization, consultation, and listening/respecting) plus overall satisfaction using an  $\alpha$  coefficient ranging from 0.74 to 0.94 (Tickner, Leman, & Woodcock, 2010). Only one subscale, organization,

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