



## CHILDHOOD IMMUNIZATION

# How knowledgeable are we?

PARENTS ARE ASKING PEDIATRIC NURSES QUESTIONS ABOUT ROUTINE VACCINATIONS, BUT DO NURSES KNOW THE ANSWERS?

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**Immunization is one of the most effective measures for protecting children from serious illness and**

death resulting from vaccine-preventable diseases. Vaccines have been so successful that many parents no longer fear many diseases that can cause permanent harm or even death. Many do not remember, for example, when paralytic poliomyelitis was rampant. Fuelled by stories and myths in the popular press about the possible dangers of vaccines, parents question the necessity and safety of vaccinating their children.<sup>1</sup> The erosion of confidence in immunization through complacency and misinformation could lead to a resurgence of vaccine-preventable diseases.

In addition to being trusted sources of information, nurses are one of the health care providers who have “a professional obligation to educate parents and to correct misconceptions.”<sup>2</sup> Nurses are excellent educators, and pediatric nurses in all settings should take opportunities to discuss the importance of immunization.<sup>3</sup> Considering those statements, a group of nurses, a physician and an educational consultant at a large university-affiliated, pediatric tertiary health care centre in Ontario recently tested the hypothesis that pediatric nurses are asked for immunization information by parents and other members of the public. Other purposes of our study were to determine whether the nurses feel prepared for this role, whether they support routine childhood immunization and whether they think that they should have a general working knowledge about this topic.

#### LITERATURE REVIEW

There is little published literature looking at hospital-based pediatric nurses’ knowledge of and level of



#### A MONTREAL STUDY IN 1998 ASSESSED THE ATTITUDES, BELIEFS AND PRACTICES OF 53 NURSES

confidence in providing information about immunization to parents. For example, the proceedings from the 1996, 1998 and 2000 National Immunization Conferences<sup>4</sup> contain no data about pediatric nurses’ knowledge and attitudes toward immunization in tertiary care centres in Canada.

In 1992, researchers at the University of Virginia Health Sciences Centre surveyed 46 pediatric nurses about their knowledge of the recommended immunizations for infants and children and to learn their perceptions of the nurse’s role in immunization.<sup>5</sup> Of the 30 nurses who responded, 25 (83%) thought that nurses in a tertiary care centre need to play an important role in immunization, yet it was found that many may not have sufficient knowledge to implement this role. A Montreal study in 1998

assessed the attitudes, beliefs and practices of 53 nurses (78% of whom were immunization providers) involved in an early perinatal intervention program for low-income families.<sup>6</sup> A concerning one-fifth of these nurses were unsure about or agreed with statements that homeopathy, good nutrition and healthy lifestyle could eliminate the need for immunization. Another study from Quebec revealed that only 59 per cent of nurse vaccinators considered vaccines completely safe, effective and useful.<sup>7</sup> Other authors state that nurses working in acute care may have difficulty in maintaining knowledge of immunization schedules and may not see immunization as a key component of acute care in comparison to the other aspects of care.<sup>8</sup>

**Table 1: Reliance on pediatric nurses for immunization information**

Question (number responding among 421 respondents)	Response			
	Yes		No	
	n	%	n	%
Do you administer immunizations as part of your practice at HSC? (n=417)	91	22	326	78
Are you asked for immunization information? (n=419)	312	74	107	26
If Yes: (n=312)				
■ by colleagues	79	25		
■ by friends	108	35		
■ by family	64	21		
■ by neighbours	36	11		
■ by parents of your patients	22	7		
■ by other	3	1		
Note: Respondents could circle more than one item.				
If Yes, when asked for immunization information do you feel prepared to answer? (n = 288)	131	45	157	55
Do you think that it is desirable for all pediatric nurses to have a general working knowledge about immunization? (n = 418)	410	97	8	2

**Table 2: Knowledge of childhood immunization schedule among pediatric nurses, n=416 (99%)**

Question	Yes	Somewhat, know where to find it	No, know where to find it	No, don't know where to find it
Do you know the current recommended immunization schedule for children in Ontario?	137 (33%)	166 (40%)	72 (17%)	41 (10%)
Among those nurses who have children ages six months to 15 years (n = 151)	72 (48%)	55 (37%)	16 (11%)	5 (3%)
Among those nurses who do not have children ages six months to 15 years (n = 270)	65 (24%)	111 (41%)	56 (21%)	36 (13%)

**METHODS**

At our pediatric tertiary health care centre, we performed a self-administered convenience sample survey of all nurses working during a 24-hour period in June 2001. A simple 13-item, one-page questionnaire was developed and pre-tested for clarity and comprehension among seven nurses in different roles such as direct care, research and infection control. The survey was approved by the Chief Nursing Officer, nursing administrators and the Research Ethics Board. A week prior to the survey date, an announcement about the forthcoming survey was placed in the hospital's weekly newsletter and on the internal nursing Web site. Based on average staffing numbers provided by nursing administration, it was estimated that approximately 500 nurses would be present at work during any given 24-hour period.

On the survey date, the questionnaire and explanatory letter were given to every nurse who came to work. The sample included nurses working in inpatient and outpatient areas, education, administration and research. Study collaborators and a team of volunteer nurses distributed the questionnaires to all locations where it was known that nurses were working. The number of nurses scheduled to work in each area for the 24-hour period was obtained and matched to the number of questionnaires distributed. A \$1 coupon for a local coffee franchise was attached to the letter as a thank-you in recognition of each nurse's time. Questionnaires, both answered and unanswered, were collected the same day or the following morning. All questionnaires were counted and collated twice to ensure accuracy in the numbers of questionnaires distributed and returned.

Data were entered into an Excel database. Descriptive statistics and content analysis were used. Frequencies were used to describe categorical data and cross tabulations to measure associations between two or more categorical variables. Questionnaire items requesting comments were separated and analysed for themes.

**RESULTS**

Of the 499 questionnaires distributed, 421 (84%) were completed, either fully or partially; not every nurse answered all questions. Unanswered questionnaires (n=78) were also collected. The majority of nurses (74%) indicated that they were asked for immunization information, yet over half (55%) did not feel prepared to answer questions. Only 22 per cent (n= 90 of the 417 who answered the question) administered immunizations as part of their practice. Of the 418 who answered the question asking whether they thought all pediatric nurses should have a working general knowledge about pediatric immunization, 410 (98%) agreed (see Table 1).

Various sources of immunization information were listed in the questionnaire, and respondents could choose more than one. There was no consistency in their responses. The most frequently indicated sources were popular media (48%), pediatricians, medical residents and fellows working at the institution (41%) and nursing journals (40%). Thirty-three per cent of respondents reported that they knew the current recommended immunization schedule for children in Ontario. Another 40 per cent said that they somewhat knew the schedule and knew where to find it. The remainder indicated that they did not know the schedule. Self-report responses were not further validated. Respondents who had children six months to 15 years of age were twice as likely to say that they knew the schedule as those who did not have children (48% compared to 24%) (see Table 2). Respondents who did not know the schedule were asked to comment. Of the 39 who wrote a comment, 25 provided reasons that included not being up-to-date in immunization knowledge (n=9), the knowledge not being required in their practice (n=7), not having children of immunization age (n=3), being new to the province (n=3) and not having their own children (n=3). ▶

RESPONDENTS WHO HAD CHILDREN SIX MONTHS TO 15 YEARS OF AGE WERE TWICE AS LIKELY TO SAY THAT THEY KNEW THE SCHEDULE



Nurses were asked what level of support they would give to individual vaccines. The number of nurses who answered the questions about whether they would recommend the routine use of individual vaccines ranged from 94 per cent (n=395 of 421) for MMR (measles, mumps, rubella) to 89 per cent (n=374 of 421) for varicella. Support was higher for the vaccines that have been longer in routine use, such as DaPTPolio-Hib (diphtheria, pertussis, tetanus, poliomyelitis, *Haemophilus influenzae* b) and MMR. None of the vaccines received a 100 per cent recommendation rate by the respondents. Of the 395 respondents who answered for DaPTPolio-Hib, 94 per cent (n=371) indicated “always,” three per cent (n=11) “sometimes” and three per cent (n=13) “never.” For the 396 who responded about MMR, 92 per cent (n=364) indicated “always,” five per cent (n=20) “sometimes” and three per cent (n=12) “never.” Of the 385 respondents to the question about hepatitis B vaccine, 65 per cent (n=252) stated “always,” 27 per cent (n=104) “sometimes” and eight per cent (n=29) “never.” Of the 381 nurses who responded about influenza vaccine, 43 per cent (n=162) indicated “always,” 42 per cent (n=161) “sometimes” and 14 per cent (n=58) “never.” Varicella vaccine received the least support with only 47 per cent (175 of 374) stating “always,” 39 per cent (n=145) “sometimes” and 14 per cent (n=54) “never” (see Table 3). It is important to note that for each vaccine, seven of the respondents who indicated “never” also stated that they were not asked for immunization information. As a result, it is not known from this survey whether the reason for not recommending the individual vaccines was that they were not asked for the information or that they did not support vaccines.

### DISCUSSION

The study confirmed the hypothesis that nurses at a pediatric tertiary care centre are asked for immunization information. Although almost all respondents (98%) thought that they should have a general working knowledge about childhood immunization, fewer than



### NURSES WERE ASKED WHAT LEVEL OF SUPPORT THEY WOULD GIVE TO INDIVIDUAL VACCINES

half felt adequately prepared to answer questions.

Nurses were given the opportunity to add a comment at the end of the questionnaire. Of the 65 nurses who did so, the majority requested educational materials/resources regarding immunization. Seven expressed anti-immunization ideas. Of these, six indicated that they were unsure about the efficacy of immunization and one simply claimed to be against immunization.

It was not surprising to learn that most nurses do not know the current recommended immunization schedule, given that the nurses surveyed were involved in tertiary rather than primary care and that the schedule is changing with the introduction of new vaccines.

A concerning finding was the lack of total support for the vaccines recommended for children in Ontario as of June 2001 although the “expectation is that most nurses are highly supportive of immunization.”<sup>9</sup> No information was collected for conjugate pneumococcal or meningococcal vaccines. These vaccines had not been recommended by the National Advisory Committee on Immunization (NACI) at the time of the survey. Since the survey, NACI has recommended the routine use of conjugate meningococcal vaccines in October 2001 and conjugate pneumococcal vaccine in January 2002.

The sources that nurses used to obtain their immunization information varied. A large number of respondents (n=160 of 403) indicated nursing journals as a source of information. Curious about which Canadian nursing journals contained articles on immunization, one member of our research team completed a CINAHL search of nursing journals published during 2000 and 2001. The key words “nurse,” “immunization,” “vaccine,” “child” and “infant” were used. Only two Canadian journal articles were located, and neither contained education information on immunization efficacy or the risks and benefits of immunization. It might be questioned whether nurses used resources that would effectively meet their knowledge needs for practice.

**Table 3: Support for specific vaccines among pediatric nurses. Survey, The Hospital for Sick Children, June 2001**

Question	Response			Number of responses per vaccine
	Always	Sometimes	Never*	
Do you recommend the routine use of the following immunizations in normal healthy children				
DaPTPolio-Hib	371 (94%)	11 (3%)	13 (3%)	395 (94%)
MMR	364 (92%)	20 (5%)	12 (3%)	396 (94%)
Hepatitis B	252 (65%)	104 (27%)	29 (8%)	385 (91%)
Influenza	162 (43%)	161 (42%)	58 (15%)	381 (90%)
Varicella	175 (47%)	145 (39%)	54 (14%)	374 (89%)

\* Seven nurses who chose “Never” said that they are not asked for immunization information.

The popular press (newspapers, television, magazines) was indicated by 48 per cent of participants as at least one source of immunization information; however, it is not known what types of information participants were gleaned from these non-professional sources or how much they supported it. We did not correlate which of these respondents also indicated using professional sources, such as journals, lectures and Web sites. A recent study of Canadian chiropractic students showed that students who reported anti-vaccination attitudes relied primarily on informal sources of vaccine information.<sup>10</sup>

There were several limitations to our study. We chose a convenience sample of all nurses working during one 24-hour period at our centre. The 421 nurses who responded represent approximately 84 per cent of those working during that time and only 30 per cent of the 1,340 nurses then employed at the hospital. The voluntary participation of the respondents introduced a degree of self-selection, and the results may not be generalized to nurses who did not complete the questionnaire nor to those who were not involved in the survey. We did not obtain data about respondents' level of education in immunization, years of experience or work setting.

It was not within the scope of our study to explore the reasons why respondents did not recommend individual vaccines. Nor did we correlate the respondents' choices for obtaining their own vaccine information with their support for vaccines. It was not a focus of our study to examine how nurses develop their perception of the efficacy of immunization and whether their clinical experiences affected their thinking or responses to families. An interesting study would be to investigate further how nurses obtain their immunization information and how they evaluate the information that may be shared with families.

#### FUTURE CONSIDERATIONS

The Canadian Nurses Association has strongly recommended that nurses maintain support for

immunization.<sup>11</sup> We need to equip pediatric nurses with easily accessible, accurate resources so that they can provide immunization information to parents, patients and other health care professionals. The finding that none of the vaccines listed received 100 per cent recommendation suggests a need for implementing educational sessions about vaccine-preventable diseases and available vaccines. Other considerations for application of our findings might include curriculum evaluation in the pediatric component at universities and colleges; an immunization component in RN refresher courses; and inclusion of immunization in continuing education courses for re-licensing requirements.

The survey heightened awareness among many staff nurses that they require more information to feel confident and competent in providing accurate immunization information to families. Interest has increased in participating in education sessions and in creating and disseminating information. For example, after the survey, one nurse who also works in a medical clinic provided inservices to nursing colleagues in the tertiary setting about the administration of immunizations because this was one skill topic of concern on her unit.

Pediatric nurses have a responsibility to ensure long-term success in eradicating vaccine-preventable diseases through parental education and completing immunization histories for their patients.<sup>12</sup> Education programs and resources have been shown to influence nursing knowledge and practice in the community setting and could be beneficial in increasing the level of support for immunization assessment and provision in the acute care setting.<sup>13</sup> We hope to develop such an education program for the acute care nurses in our facility and to evaluate its success in increasing nurses' immunization knowledge and confidence in discussing immunization with parents, other health care professionals and the public. u

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