

## CLINICAL PRACTICE

# The Invisible White Coat: Awareness of Pharmacists in a Neonatal Intensive Care Unit

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## INTRODUCTION

Hospital pharmacists play an important role in improving patient outcomes and have a positive impact on patient safety and survival.<sup>1</sup> In one study,<sup>1</sup> the following 7 pharmacy services had a statistically significant association with reduced mortality rates: pharmacist participation in medical rounds, pharmacist-provided admission drug histories, drug-use evaluation, in-service education, management of adverse drug reactions, management of drug protocols, and participation on the cardiopulmonary resuscitation team.

Pharmacists provide patient-centred care to ensure safe and effective drug therapy. Despite the known benefits in terms of patient outcomes and safety, many patients and their families are unaware that a pharmacist is part of their health care team and are similarly unaware of the services that pharmacists provide. According to the *Hospital Pharmacy in Canada 2009/2010 Report*,<sup>2</sup> of 222 Canadian hospitals, about half ( $n = 112$ ) reported conducting client satisfaction surveys, and only 27 (24%) of these stated that the survey included a question about speaking to a pharmacist while in hospital. Among hospitals that asked patients and families about speaking with a pharmacist, less than half of the patients remembered speaking with a pharmacist while in the hospital.<sup>2</sup> A telephone survey conducted by Alberta Health Services found that 21% of patients remembered speaking to a pharmacist.<sup>3</sup>

One of the objectives for pharmacy practice in hospitals and related health care settings to be achieved by 2015, as part of the Canadian Society of Hospital Pharmacists' CSHP 2015 initiative, is that "50% of recently hospitalized patients or their caregivers (family members for example) will recall speaking with a pharmacist while in the hospital".<sup>4</sup> Although the target of 50% is arbitrary, this objective is part of the overarching goal to "increase the extent to which pharmacists in hospitals and related healthcare settings help individual hospital inpatients achieve the best use of medications".<sup>4</sup> The neonatal intensive care unit (NICU) setting provides unique opportunities and challenges

for meeting this CSHP 2015 objective. Babies and their families "live" in the NICU for periods of weeks to months. The babies are critically ill, and their health status may change or fluctuate dramatically and quickly. Little information is available regarding the safe and effective use of medications in this patient population. Pharmacists working in NICUs use specialized knowledge and skill sets to ensure effective and safe pharmacotherapy as the babies grow and develop and their health status changes. Families face immense stresses, sometimes with multiple babies (e.g., twins or triplets) receiving treatment, and during their stay meet a multitude of health care providers, all of whom give them information emphasizing different aspects of their baby's (or babies') care.

The goal of this study was to improve families' access to and awareness of their babies' pharmacists. The primary objectives were to increase families' awareness of the NICU pharmacist and to describe topics that families want to discuss with the NICU pharmacist.

## METHODS

### Selection and Description of Participants

The NICU at the BC Women's Hospital and Health Centre (an urban, tertiary care, academic health sciences centre) has 65 beds and is serviced 24 hours a day, 7 days a week by a satellite pharmacy. The NICU satellite pharmacy is staffed by one pharmacist and one pharmacy technician per shift. The pharmacy team includes 6 pharmacists who work 12-h shifts and a larger group of technicians who work 8-h shifts. The NICU pharmacists provide both clinical and drug distribution services. The services that pharmacists provide are similar during the days and at night, as well as on weekends. In addition to their NICU responsibilities, the NICU pharmacists provide services to the pediatric intensive care unit (PICU) between 1600 and midnight and provide on-call service to the PICU and other inpatient wards between midnight and 0700. They have direct patient contact and perform a variety of activities, including participation on morn-

ing medical rounds, adjusting and monitoring drug therapy, managing adverse effects, and teaching caregivers about discharge medications. The continuous access to a pharmacist and the number of patients in the NICU made it an ideal setting to implement an intervention to improve families' awareness of and access to a pharmacist and to collect survey data before and after an intervention.

The study was approved by the University of British Columbia / Children's and Women's Health Centre of British Columbia Research Ethics Board. All families (parents and/or primary caregivers) of babies receiving care in the NICU and being discharged during the survey periods were eligible to participate. Exclusion criteria were inability to speak, understand, read, and/or write English fluently or death of the patient. Informed consent was obtained from pharmacists and from patients' families via participation and completion of the surveys.

## Intervention

The intervention to increase families' awareness of pharmacists involved the pharmacists introducing themselves to families and providing a pamphlet that described the role of a pharmacist and examples of the types of questions that families could ask. The pamphlet was developed in collaboration with the NICU pharmacists. The pharmacists informed families that if they had any questions, they could ask, via the nursing staff, to speak with a pharmacist. The pharmacists kept track of which families they had approached using a spreadsheet kept in the satellite pharmacy; data collected included the date, the baby's surname, the baby's identification number, and the pharmacist's initials (to avoid duplication). The intervention was in place for 8 weeks.

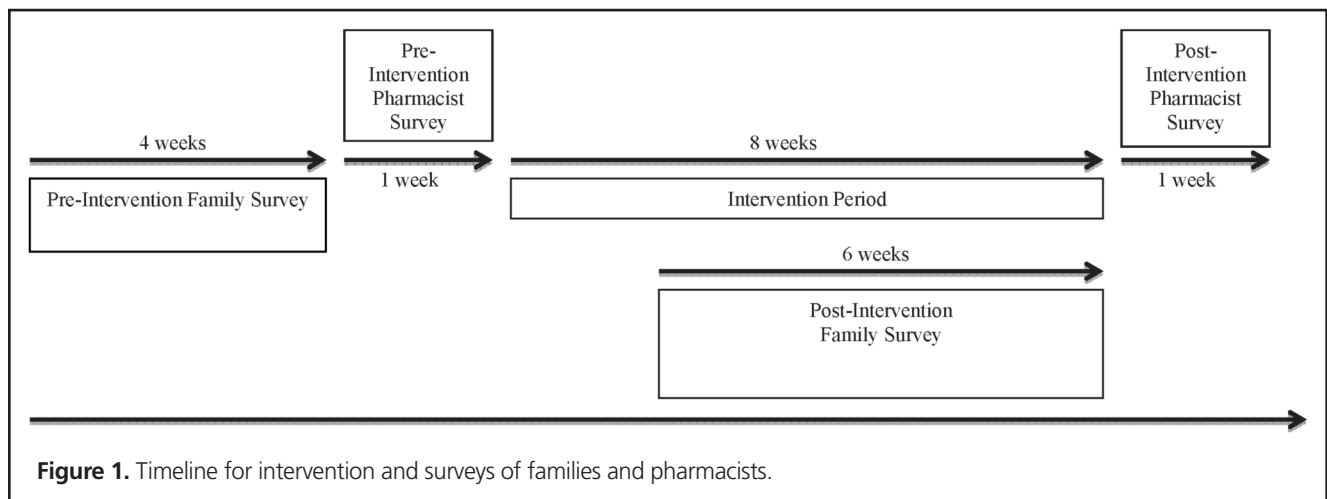
## Surveys

The study timeline is outlined in Figure 1. For a 4-week period ending 1 week before the intervention was implemented, all families whose babies were scheduled for discharge from the

NICU within 1 to 2 days were approached by a study investigator and asked to complete a survey (the pre-intervention survey; see Appendix 1, available online at [www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc](http://www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc)). None of the study investigators were involved in direct patient care in the NICU. The survey, which took 5–10 minutes to complete, assessed whether or not families recalled speaking with their babies' pharmacists during the hospital stay. For families who recalled speaking with a pharmacist, the survey characterized their interactions with the pharmacist. For families who did not recall speaking with a pharmacist, the survey asked what they would have liked to discuss, choosing from 8 predefined topics, with the option to select more than one topic. Beginning 2 weeks after the start date of the intervention and continuing to the end of the intervention period, all families whose babies were discharged from the NICU were approached to complete a similar survey (the post-intervention survey; see Appendix 2, available online at [www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc](http://www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc)). In addition to the questions posed in the first survey, this survey also included questions regarding the intervention.

During the 1-week period between the end of the families' pre-intervention survey and implementation of the intervention, the NICU pharmacists were asked to complete a 5- to 10-minute survey to determine the number of interactions with families without the intervention in place, the nature of those interactions, and the potential barriers they expected to experience with the intervention (see Appendix 3, available online at [www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc](http://www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc)). Upon completion of the 8-week intervention period, the pharmacists were asked to complete a similar survey, which also included questions regarding their experiences with the intervention (Appendix 4, available online at [www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc](http://www.cjhponline.ca/index.php/cjhp/issue/view/103/showToc)). Pharmacists were given 1 week to complete the surveys before and after the intervention period.

The family survey was a paper-based document, whereas the pharmacist survey was an online survey using Enterprise Feed-



**Figure 1.** Timeline for intervention and surveys of families and pharmacists.

back Management (Vovici EFM Continuum software, Vovici Corporation, Herdon, Virginia). Both surveys were self-administered and anonymous. Families placed their survey responses in sealed envelopes, which were collected by a study investigator and not opened until the end of the survey period. The surveys were developed by the investigators alone, with no involvement of families or pharmacists, and were not modelled on or adapted from other studies. The questions were kept deliberately short, to encourage participation, with a combination of closed-ended and open-ended questions. Potential topics for discussion between families and pharmacists were based on what would typically be covered in medication teaching, but an “other” category was available to ensure that no topics of interest to respondents were missed. Family and pharmacist interactions could be quantified using the closed-ended questions, which allowed for statistical analysis. To assess families’ satisfaction with pharmacists, as well as families’ and pharmacists’ satisfaction with the intervention, a 5-point Likert scale, ranging from “very dissatisfied” to “very satisfied”, was used. The Likert scale allowed participants to anonymously and measurably indicate the degree to which they were satisfied. Use of a Likert scale is also potentially more helpful in making a baseline assessment and developing further initiatives to enhance family and pharmacist relationships.

### Statistical Analysis

The primary outcome was the percentage of families who recalled speaking with a NICU pharmacist before and during the intervention. The family survey data regarding speaking and interacting with a pharmacist were analyzed using the 2-sided Fisher exact test. The pharmacist survey data were analyzed with descriptive statistics. SPSS 17.0 software (IBM, Armonk, New York) was used for these analyses.

## RESULTS

A total of 143 babies were treated in the NICU during the 8-week intervention period, and 35 pamphlets were handed out to families by the 6 pharmacists working in the NICU. Before the intervention period, 14 of 39 eligible families were approached to participate, of whom 12 enrolled in the study. During the intervention period, 10 of 55 eligible families were approached, all of whom agreed to participate. The main reason for not approaching families to participate was that many of the families were not available. All 6 of the pharmacists completed both surveys.

There was no statistically significant difference in the number of families recalling introduction to or interaction with a pharmacist before and during the intervention (Figure 2). One (10%) of the 10 families surveyed after the intervention reported receiving a pamphlet and ranked the level of satisfaction with the pamphlet as “satisfied”. In total, 19 (86%) of the 22 families surveyed before or during the intervention period indicated

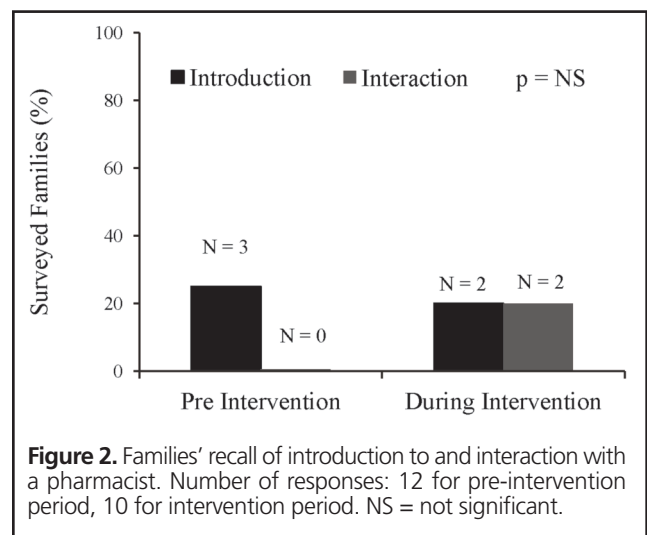
interest in speaking with a pharmacist about a variety of topics (Table 1).

In the pre-intervention survey, pharmacists reported introducing themselves to a median of 4% (range 0% to 15%) of families and interacting with a median of 5% (range 0% to 20%) over a period of 4 weeks. In the post-intervention survey, they reported introducing themselves to a median of 4% (range 1% to 25%) of families and interacting with a median of 4% (range 0% to 40%) of families over the 8-week intervention period. There appeared to be no difference in terms of pharmacist and family introductions and interactions before and during the intervention. The NICU pharmacists identified a range of topics discussed with families before and during the intervention (Table 1). In terms of judging the practicality of the intervention, of the 6 pharmacists who responded to the survey, 1 pharmacist found it “very useful”, 4 found it “somewhat useful”, and 1 found it “not at all useful”. Although 3 of the pharmacists cited insufficient time as a barrier (Figure 3), only one pharmacist agreed with the statement that “the study intervention increased my workload” (question 4 in Appendix 4; data not shown).

## DISCUSSION

The percentage of families who recalled speaking with a NICU pharmacist did not differ before and during the intervention. The study team did not meet the CSHP 2015 target of “50% of recently hospitalized patients or their caregivers (family members for example) will recall speaking with a pharmacist while in the hospital”. The pharmacists reported multiple barriers to introducing themselves and handing out the pamphlets, which may have reduced the number of introductions and opportunities for pharmacists to speak to families.

Erstad and others<sup>5</sup> designed a prospective randomized study to determine whether patients in a 300-bed tertiary teaching hospital who were given increased contact with a pharmacist would have greater awareness and knowledge of the hospital

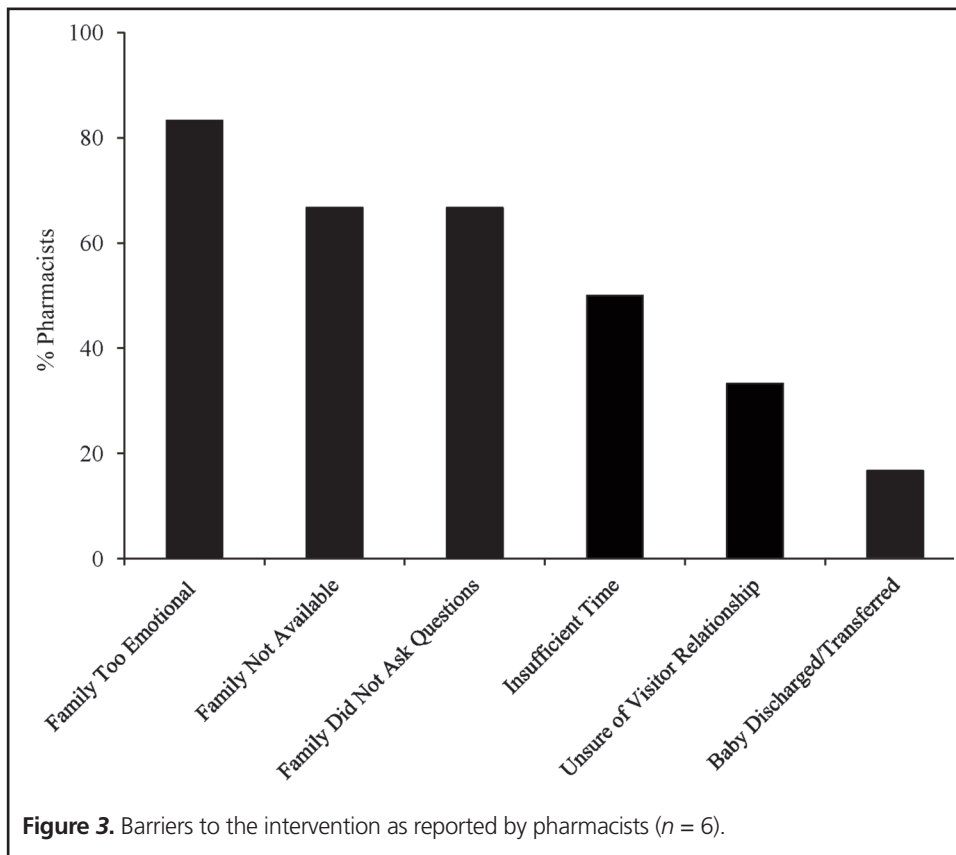


**Figure 2.** Families’ recall of introduction to and interaction with a pharmacist. Number of responses: 12 for pre-intervention period, 10 for intervention period. NS = not significant.

**Table 1. Topics of Interest Identified by Families and by Pharmacists before and after Intervention\***

Topic	Identified by Families (n = 22)	Identified by Pharmacists	
		Before (n = 6)	After (n = 6)
Side effects	16 (73)	4 (67)	4 (67)
Medication use in breastfeeding	15 (68)	3 (50)	5 (83)
Indications for medications	13 (59)	2 (33)	3 (50)
Drug interactions	12 (55)	1 (17)	1 (17)
Medication names	10 (45)	2 (33)	3 (50)
Medication administration	10 (45)	2 (33)	0 (0)
Medication information resources	9 (41)	0 (0)	0 (0)
Other	4 (18)	1 (17)	1 (17)

\*Data are expressed as number (and percent) of families or pharmacists responding.



**Figure 3.** Barriers to the intervention as reported by pharmacists (n = 6).

pharmacist's role than those who received usual care (with minimum contact with a pharmacist). Their intervention involved pharmacy residents seeing their assigned patients at least once a day outside of team rounds. Each pharmacy resident gave his or her patients a business card with the resident's name, pager number, and other contact number. All patients (32 in the intervention group and 33 in the control group) were asked to fill out a questionnaire at discharge. Patient responses were measured using a Likert-type questionnaire with 12 items, 7 of which addressed awareness and general satisfaction with pharmacy services. Responses were scored from 1 to 5, with a

low score being desirable. In terms of awareness (based on sum for 3 questions, for a maximum possible score of 15), the intervention group had a mean score of 5.41, whereas the control group's mean score was 6.88 ( $p < 0.05$ ). The study by Erstad and others<sup>3</sup> had more participants than the current study (65 v. 22 completed questionnaires), it was not done in a pediatric setting, and it did not include an intervention that was part of the pharmacist's routine duties.

A telephone survey conducted 2 months after patients were discharged from Alberta Health Services included 397 patients from 4 hospitals.<sup>3</sup> The primary outcome was the proportion of

patients who recalled interactions with a pharmacist on the unit where they had been treated. Eighty-three respondents (21%) recalled speaking with a pharmacist during their most recent hospital stay.<sup>3</sup>

Doucette and others<sup>6</sup> also investigated patient recall of interactions with a pharmacist during a hospital stay. Their study involved 399 patients from 27 units in 9 hospitals, who completed a telephone questionnaire following discharge. An electronic health record was available for 181 of the patients, and these patients were included in the analysis. Sixty-two (34%) of the patients recalled an interaction with a pharmacist, although nothing was documented in the patient's medical record.<sup>6</sup> Twenty-five (14%) of the patients did not recall an interaction, but there was documentation indicating that a pharmacist had seen the patient, and 35 (19%) did not recall an interaction and had no documentation of an interaction. Similar to the current study, patients indicated a desire to interact with pharmacists. However, unlike the current study, the mean age of patients was 67 years (range 19–94 years), and the study involved a telephone questionnaire implemented up to 5–7 months after the admission.<sup>6</sup>

Most studies investigating patient awareness of and/or satisfaction with their interactions with a pharmacist have examined the situation directly from the patients' perspective. In contrast, the current study was conducted in a specialized neonatal critical care unit, and the focus of interactions was therefore with the family, not the patient. When an intervention is implemented or patients and their families are surveyed, it can be more difficult to approach family members, because they usually come in at different times during the day and night (whereas hospital inpatients may be available most of the time). Furthermore, the study was done in a critical care area, where pharmacists' roles and responsibilities are often not clearly visible to families, and where these roles differ from those in a less acute care setting. For example, NICU pharmacists perform pharmacokinetic monitoring, monitor vital signs and laboratory results, adjust medication dosages, enter orders, perform clinical checks, and dispense medications, as all of these aspects of care can change rapidly in a critical care setting. Studies indicate that patient and family recall and appreciation of pharmacists increase when a conscious effort is made by clinical pharmacists to introduce themselves and be readily available.<sup>2,3,5,6</sup>

This study investigated specific topics that families would like to discuss with pharmacists. Interestingly, the topics that families wanted to discuss with their pharmacists related not only directly to the baby's care, but also to the mother's pharmacotherapy issues. This study identified another important area of focus for NICU pharmacists, that of providing information about the safety of medication use in conjunction with breastfeeding. Neonates are rarely placed on long-term medications, but their mothers may be receiving long-term medication therapy that can affect the baby. Families were more interested in speaking

with the pharmacist about side effects than in the names of or indications for medications. This may be because nurses provide information about drug names and indications to families when they are administering the medications.

## Limitations

Despite a total of 94 patients being discharged from the NICU before ( $n = 39$ ) and during ( $n = 55$ ) the intervention period, only a small sample of families could be surveyed. As noted above, families are present in the hospital at various times, often at night, and some families or parents may live too far away to come in. Unfortunately, it was not feasible for the investigators to be present in the NICU at all times to approach and survey families, and the study team often relied on nurses paging an investigator when a family arrived. It was decided to survey families while their babies were still in the NICU, instead of surveying by phone or mail following discharge. Families are routinely surveyed by mail following discharge as part of quality-of-care investigations at the study hospital, and response rates are very low (less than 5% [internal unpublished data]). Using a phone survey would have precluded anonymous feedback from the families. Another limitation in terms of study design was that the study was uncontrolled.

The major limitations of the surveys used in this study were that many questions relied on families' and pharmacists' recall of interactions. Many families have babies in the NICU for days to months, which can be stressful and can mean that families have a hard time remembering who they met during their time in the NICU. Pharmacists are busy in their distribution and clinical duties; unless they personally recorded their interactions with families, their responses were based on what they could remember.

The intervention period was relatively short, and participation by pharmacists in the intervention was not optimal. This low participation may have been due to difficulty in incorporating the intervention with routine clinical and distribution duties, as well as the reported barriers discussed above and presented in Figure 3. It is possible that pharmacists interacted with more families than those to whom they provided pamphlets during the study period, as part of their routine clinical duties.

## CONCLUSIONS

Although this study did not show a difference in families' awareness of hospital pharmacists following the intervention, it did demonstrate that families are interested in speaking with a pharmacist. More study is needed to adequately evaluate families' awareness of hospital pharmacists and to test various tools and/or strategies to increase awareness. The study also showed that families are interested in speaking with a pharmacist about topics that pharmacists may not have considered as priorities. Given

the nature of NICU practice, this study raises the question of whether the 50% CSHP 2015 goal (i.e., proportion of hospitalized patients or caregivers who recall speaking with a pharmacist) is realistic for all clinical settings.

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