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Navigating Independent Double Checks for Safer Care: A Nursing Perspective

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Nursing Honors Thesis
University of New Hampshire
Southern New Hampshire Medical Center

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Abstract

The purpose of this study was to explore registered nurses' understanding and practice of "independent double-checks" prior to administration of high-alert medications. The study used a qualitative descriptive design for data collection and data analysis. It included thirteen participants from a hospital located in southern New Hampshire. Results of the study revealed a core theme of navigating independent double checks (IDC) for safer care. Two major themes stemming from the core theme were also uncovered. Navigating IDC through knowing and navigating IDC through nurse partnership both focused on the perception and practice on IDC prior to administration of high alert medications. IDC was accepted and promoted as best practice, but the definition and process is still unclear. Having a universal definition will assist in clarity of the process and in turn, promote ensuring safe administration of high alert medications to patients.

Keywords: independent double check, safer care, knowing, nurse partnership

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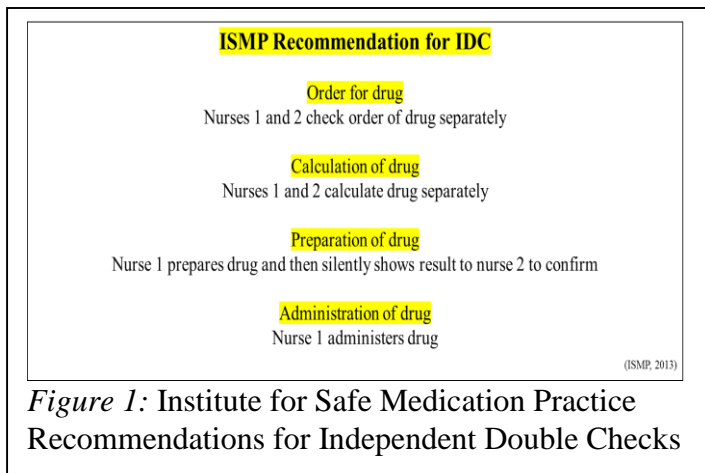
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Introduction

According to the Quality and Safety Education for Nurses (QSEN) Institute, the significance in errors in patient care has been highlighted in the literature and media since the Institute for Medicine produced *To Err is Human: Building a safer health system* in 1999 (Kohn, Corrigan, and Donaldson, 2000). It concluded that medical errors cause up to 98,000 deaths annually. A major source of morbidity and mortality from medical mistakes are due to medication errors prior to administration to the patient. The goal of a culture of safety is to “minimize risk of harm to patients and providers through both system effectiveness and individual performance” (Sherwood & Barnsteiner, 2012). Nurses have a central position in improving the quality and safety of care.

A strategy widely promoted to detect and minimize errors from high-alert medications before reaching patients is an independent double check (IDC). It is estimated an IDC has the



ability to detect up to 95% of errors, although a national medication error rate does not exist. Nurses were taught the use of the “five rights” of medication before administration: the right patient, drug, time, dose, and route. Failure to pay pertinent attention to these rights is

a contributing factor to medication errors causing a need for a double check. The Institute for Safe Medication Practice (ISMP) offers a recommended definition for IDC. These recommendations describe double checks are the most effective when conducted independently by a second nurse. This reduces the risk of bias that the second person to likely see what they

expect to see. A pictorial model was created to simplify the independent double check process presented by the ISMP, illustrated in Figure 1. Despite the definition and recommendation provided by the ISMP, however, the actual process of an IDC still remains inconsistent among nurses.

Review of the Literature

Improving Medication Safety

Independent double-checking is an important strategy to prevent drug errors, but a universal definition does not exist. Although there is a vast array of studies focusing on nurses' perceptions about issues related to medication errors, there is paucity of practice-based research on nurse IDCs (Brady, Malone, & Fleming, 2009; Gladstone, 1995; Monroe, Heck, & Lavsa, 2012). Only one study was found in the United States (US), however, it addressed double checking medication from unit stock at pharmacy not prior to direct administration to the patient.

A literature review was completed to evaluate available evidence on the use of double-checking in preventing errors. The search performed included PubMed, EMBASE, Medline, and CINAHL using the terms *double-check* and *medication administration*. Seventeen articles were included in the review from Australia, the United Kingdom (UK), the US, Sweden, and New Zealand. Articles on administration to both adults and children were included. Two studies defined double-checking, however, both failed to elaborate on an exact definition. Without this definition, there is a variety of possible approaches to double checking, illustrated in Figure 1. Variations were found in the calculation of the drug, preparation of the drug, and administration of the drug, leading to a lack of clarity. A comprehensive definition and explanation of the double-check process is recommended to decrease these inconsistencies.

Single-checking versus Double-checking Medications

Five studies compared the effectiveness and safety of single-checking medications compared to double-checking medications. Only one nurse is involved during a single check of medications. One study from Australia (Kruse, Johnson, O'Connell, & Clarke, 1992) found that medication error rate was significantly lower with double-checking than that with single checking. Three of the studies indicated nurses were in favor of single-checking; they reported taking greater care when they had sole responsibility and it saved on average about 20 minutes during medication administration (Jarman, Jacobs, & Zielinski, 2002; O'Connell, Crawford, Tull, & Gaskin, 2007; Winson, 1991). The time-saving outcome was the main reason nurses' preference was toward single-checking compared to double-checking medications.

Double-checking Medications

The effectiveness of double-checking examined in a study in Taiwan found double-checking medications detected 30.5% of actual errors and 29% of near-misses. This study focused on double-checking all medications, but concluded it would be most beneficial and time efficient to restrict it to high-alert medications (Sheu, Wei, Chen, Yu, & Tang, 2009). A large pediatric hospital in the UK noted that 130 out of 195 reported errors over a 5 year period occurred despite double-checking, however, double-checking was not carried out in 30% of cases (Ross, Wallace & Paton, 2000).

Researchers from New Zealand explored pediatric nurses' understanding and practice regarding IDC through a descriptive qualitative design (Dickinson, McCall, Twomey, & James, 2009). Data was collected from three focus group interviews involving pediatric nurses from different levels of practice. Four themes were identified: IDC is best practice, variability in process of double-checking, environmental influences, and attitudinal influences. All participants

supported IDC practice due to its assistance in patient safety, prevention of medication errors, and protection of the nursing staff from the consequences of drug errors.

The actual process of double checking was inconsistent in terms of calculation, preparation, and administration of the drug. Overcrowded medication rooms, interruptions during preparation, and workload demands acted as environmental factors interfering with the IDC process. Beginner and experienced nurses posed a challenge to each other from both views in regards to misplaced confidence and lack of acceptance. The study claimed work was underway to improve computer access to drug information and a standardized list of medication from each area, which requires IDC. While IDC was clearly identified as an accepted practice, when administering medications, the study demonstrates how nurses have different interpretations of what this means leading to a lack of clarity.

Double checking by two nurses was used by UK hospitals to prevent or reduce medication administration errors. A prospective observational study was conducted to evaluate how closely double-checking policies are followed by pediatric nurses and errors that occur despite the process (Alsulami, Choonara, and Conroy, 2013). Two thousand drug doses were observed and evaluated during preparation and administration. Eleven double-check steps for each administered drug dose were assessed: dose, drug, dosage formulation, drug calculation, measurement of dose route, expiration date, allergy check, patient identity, administration, and documentation. Obvious independent double-checking of the calculation of the dose was observed in less than one-third of cases. The study found nurses adhered more closely to double-checking steps on weekends than weekdays. Errors identified included incorrect administration, incorrect preparation, and incorrect time. The most frequent medication administration error involved drugs being administered by parents unsupervised by nurses although this is a deviation

from hospital policy. The study found that inconsistencies in double-checking may have resulted from differences in nurse knowledge of the IDC process.

Hsaio and Taiwanese colleagues (2009) engaged in a cross-sectional study developed a questionnaire used to measure nurses' knowledge of high-alert medicines (section 1) and to analyze known administration errors (section 2). A total of 305 nurses from general hospitals participated in the study (Hsaio et al., 2009). Section 1 of the questionnaire only produced a correct response from 56.6% of nurses. Nurses work experience was the major contributing factor to this score. It was reported that 75.4% of nurses expressed insufficient knowledge with high-alert medications. Responses to section 2 described a total of 184 administration errors, mostly involving the wrong drug or wrong dose. Evidence from the study strongly suggested nurses had insufficient knowledge of high-alert medications, therefore, could benefit from additional education.

Issues regarding Double-checking

There were prevailing views on the benefits and drawbacks of double-checking medications, with time being the biggest restraint. While it may significantly reduce risk to the patient, nurses find it takes away their individual responsibility. The key factor of double-checking, however, is patient safety yet there is a lack of resources and clarity on an exact definition of this process.

Overall, international findings concluded a lack of clarity in the definition of an independent double check. While it may be best practice in preventing medication errors, there is a variation in approaches and understandings. Expanding further investigation regarding US nurse perceptions and practice of IDC administration of high alert medication would add to the certitude, causality and generalizability of previous research findings.

Statement of Purpose

The purpose of this study is to explore registered nurses' understanding and practice of “independent double-checks” prior to administration of high-alert medications.

Definition of Terms

Independent Double Check

According to the ISMP, an IDC is a “procedure in which two clinicians separately check (alone and apart from each other, then compare results) each component of prescribing, dispensing, and verifying the high-alert medication before administering it to the patient” (ISMP, 2014).

Methodology

Design

This research study was a modified replication of a qualitative descriptive design conducted by Dickinson et al. (2010). The goal of qualitative descriptive research is to produce a description of participants' experiences in words as similar to what the participants said as possible. This research method will offer rich and interesting data on registered nurses' perceptions and practice of the independent double check process.

Setting and Sample Description

Registered Nurses (RNs) from any medical surgical unit at Southern New Hampshire Medical Center were invited to participate in the study via fliers posted around the hospital (Appendix A). There were no exclusion criteria as all nurses administer medication and have familiarity of IDC. Nurses who experienced interest were taken to a quiet, private area to conduct the interview at their convenience.

Demographic factors were measured to provide an accurate description of the sample (Appendix B). All, but one of the participants, were female. The one male participant was also given a female pseudonym to protect identity. All participants worked on a medical surgical floor with most being full time employees scheduled for day shifts. Educational background varied; two diplomas, four associates, and seven baccalaureates. Total years practicing in nursing ranged from novice to expert nurses; five participants had less than 5 years of experience, six had between 7 and 11 years of experience, and two participants had 25 years or more years of experience.

Ethical Considerations

Before data collection began, the University of New Hampshire Institutional Review Board and the Southern New Hampshire Medical Center (SNHMC) Institutional Review Board granted permission to conduct the study. Written informed consent was obtained from each participant prior to the beginning of the focused interviews. Participation was voluntary and anonymous; nurses were allowed to leave the interview at any time. No direct compensation was provided, but nurses were paid their hourly rate while participating. Pseudonyms were provided in order to safeguard nurse identity within the thematic description of the data.

Data Collection

Preceding the start of each interview, the participant filled out an informed consent form (Appendix C). Participants were made aware they would be audio-recorded and were instructed not to identify themselves by name or unit. Following their consent, participants were given a brief handwritten demographic questionnaire (Appendix D). Data collection was obtained from interviews by audiotaping then transcribing verbatim. All participants were asked the primary open-ended question, “What do you currently understand is the meaning of IDCs prior to

administration of high-alert medication?” Additional clarifying questions (Appendix E) were used to facilitate a greater understanding of nurses’ experience.

Interviews were recorded with a digital audio recorder. Audiotapes were destroyed following transcription. Interviews were downloaded on a personal computer, and were password protected. Only the researcher, the Nursing Honors Coordinator, and the Faculty Sponsor had access to the files. The transcribed interviews contained no identifying information related to the research subjects, and pseudonyms were used to maintain confidentiality.

Data Analysis Procedures

Interviews were audio-taped then transcribed verbatim. Data collected from transcripts was analyzed to identify patterns to generate themes and sub-themes. (Polit & Beck, 2012). Interview data was examined by individual response as well as in relation to overall context. Typed transcriptions were compared with audiotapes to ensure that all material was transcribed correctly. Transcripts were then read and reread to permit line-by-line examination of participants’ statements. Next, the researcher coded each interview on a line-by-line basis to identify patterns and themes. Lastly, common themes embedded in the data were reviewed and reflected upon.

Date Collection Results

Core Theme

Navigating IDC for Safer Nursing Care. After exploring registered nurses’ perception and practice of “independent double-checks” prior to administration of high alert medications, data analysis uncovered a core theme of Navigating IDC for Safer Nursing Care. The process as a whole was described as being a beneficial tool in decreasing medication errors while enhancing the safety of the client. In response to looking at advantages of double checking medications, one

participant stated, “Making sure that that is the correct dosage [of medication] so there is no harm to the patient. Patient safety.” As mentioned by many participants, the major advantage of double checking high alert medications is to keep the client safe by doing no harm. This process enables the nurse to verify the five drug rights (patient, drug, dose, time, route) individually and with another nurse prior to the administration of medication in order to reduce errors. One participant illustrates this by saying double checking helps to “make sure we don’t make any errors and that we have the right patient, the right drug, the right everything” (Melanie). Two main themes stemming from the core theme were also uncovered during data analysis; both focusing on the perception and practice on IDC.

Theme I:

Navigating IDC through knowing. All participants expressed an individualized understanding of the meaning of an IDC that emphasized an accurate definition. The process of double checking was described as being completed prior to administration of high alert medications, such as magnesium, by verifying all necessary components. Most understandings were correctly steered towards having two nurses separately check any high alert medication preceding administration. One nurse revealed her understanding as the following:

My understanding of that [IDC] is when you go into a patient’s room or prior to going into a patient’s room, you have another nurse look over what you are doing for that information or review the medication you are administering, making sure that all the right doses are calculated for medications and done in the right manner. (Susan)

Two other participants also spoke of this verification process with the understanding to check and look over high alert medications by using the involvement of a second nurse. They stated,

I understand that when I do have a high alert medication, and when I do check it, I have a second nurse with me and we verify that it is the same drug, the same dose, to the patient. (Kelsey)

So here you have to draw it [heparin] and have a second nurse verify that it's the correct medication, the correct dose, all that. (Laura)

An important component of IDCs that is also addressed by participants comprises the process of both nurses independently reviewing the medication before consulting each other. This enables each nurse to verify and check the information independently to help address any deviations from one another. Knowing this process allows the check to be completed with the most precision. Three participants clearly echoed the knowing of this process in their interviews.

It means that if I see the independent double check I would, myself, make sure I am giving the right med, the right rate, the right person, all that. And then I would find another nurse and say, "Can you please check this med and tell me what I should be doing." And they would then tell me what the rate is supposed to be and that, that, and that. (Kayla)

It means that you double check the medication yourself and then you ask a coworker to independently check it themselves. (Candace)

Well you have a second nurse come in and you don't tell them how you got the answer. They look at what the order is, they do the calculation themselves, and then we compare at the end to see if what I got and what the other nurse got is correct. (Shivani)

All in all, the participants expressed similar ideas of knowing involving the IDC process. By individually looking over medications prior to administration, their correct understandings will aid in reducing medication errors.

Theme II:

Navigating IDC through nurse partnership. A major component in performing IDCs is utilizing a second nurse to complete the process. All participants verbalized an understanding to acquire another nurse prior to administration of high-alert medications. In describing their practice of double-checking medications, responses were piloted toward nurse to nurse interactions to verify medications. Two participants clearly stated their practice of IDC as follows:

I hang the medication, I program the pump. I then grab another nurse to make that that everything is correct on the pump before hitting start. (Ilana)

I would check it [medication] myself, and then I would grab another nurse and say, “Hey, I’m hanging IV Mag, can you just come in and verify the dose. (Candace)

This verification with another nurse allows for the correct drug administration to the client, a major advantage of the IDC process. As mentioned, nurse partnering is a required component in completing IDCs. One participant mentioned a nurse to nurse partnership established by an assigned buddy system as a factor to simplify the process.

One factor that benefits is having your buddy assigned to you in the morning. Knowing that is the one person you can go to, and they can go to you as well. (Ilana)

Other factors that aid in making double-checking medications more simplified are steered toward the availability of staff and the computer system. Adequate staffing enables someone to be around when needed to perform an IDC. One participant reflected on her experience with staff availability.

If staffing is good then it makes it easier to have nurses available... That’s the biggest obstacle, having somebody when you need them. Like if it’s a crazy day, and there isn’t a lot of staff. Like today, I had to do a double check for a narcotic, and there’s only three nurses [on the floor]. Two of them were putting in an NG tube, so I had to wait to do my pain medication because there was nobody there. (Shivani)

The participants identified the computerized system and scanning process as an advantage during the process of IDCs. These systems prompt the nurse that a double check is needed and will not allow for medication to be administered without the presence of a second nurse. The computer system will alert the administering nurse that the medication requires a double check, and the badge of two separate registered nurses then must be scanned.

When you do scan it [high-alert medication], it [computer system] will ask you for another nurse. It will ask you for a second nurse, for their badge. You can’t even chart that you gave it until you have scanned another nurse’s badge. (Kelsey)

The computer definitely helps. We are made aware of the meds that need it [IDC], like magnesium, insulin, blood. (Alyssa)

Even with these highlighted advantages, nurses still faced challenges in their practice of IDCs, specifically time and staffing. Unfortunately, availability of staff is not always adequate which slows down the process and requires additional time. One participant reflected her feelings on these challenges in relation to delaying care to the patient.

The only one [disadvantage] I would say is time. Time to find the nurse. If they only got two or three nurses on the floor, the census is low, now you have to wait and now you are delaying care to that patient because you have to find that double nurse. (Kelsey)

Despite the challenges faced, however, participants agreed that the necessity of double checking high-alert medications was still of utmost importance to adhere to the safety of the client. Three participants echoed this recognition as follows:

Not really any [disadvantages] other than you get busy, but I don't think there is any disadvantage to double check. (Kayla)

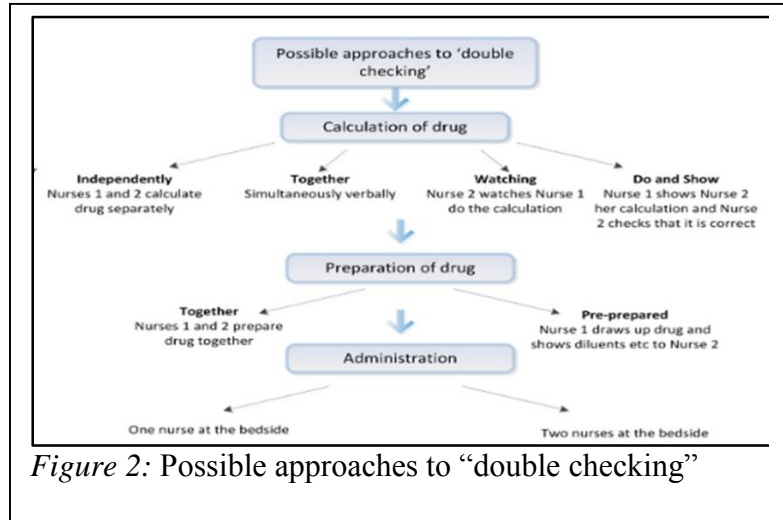
Sometimes there is not a nurse readily available, like on nights. Sometimes there is like two or three nurses max, so you have to like run around and try and find someone. And sometimes it can delay getting the med in, but it's more important to check it anyways. (Alyssa)

The only [disadvantage] factors would be being able to find another nurse when you need to medicate that patient. But the advantages outweigh the disadvantages. (Lauren)

Discussion

The process of independent double checks of medication appears to be accepted by nurses as the “gold standard” when administering high-alert medications; however, interpretations of what this means is still unclear. While participants had an understanding of the basic process, there was still a lack of clarity in their exact procedure of performing a double check as in previous studies conducted.

Ramasamy and colleagues (Ramasamy, Baysari, Lehnbohm, & Westbrook, 2013) created a pictorial model to illustrate possible approaches to double checking, shown in figure 2. From this study, clarity and further education was still needed



to allow practice to resemble the process shown in the pictorial model depicting the recommended definition provided by the ISMP-(Figure 1).

Looking further into the IDC policy at SNHMC, the definition is “a two person check on selected high alert medications performed independently immediately before administration.” With the ISMP model as a reference, there was still a lack of clarity on the independent nature of aspects prior to administration noted in SNHMC’s definition.

The challenge of attitudinal influences faced in other studies was not evident in this study. Beginner and experienced nurses both accepted IDC as best practice in adhering to safe patient care. There was no expression of annoyance by either nurse during the process. A principal reason for this may be due to the addition of a computerized medication administration record system. As noted throughout the interviews, high alert medications could not be administered without scanning the badge of another nurse. This assisted in the insufficient knowledge aspect noted in the literature. Nurses were automatically notified of high alert medications needing a second check even if they did not have this knowledge base. The addition of the computerized system was found as a major advantage in this study.

Study Limitations

The major limitation of this study was the small sample size. Only thirteen registered nurses consented to be interviewed, and the focus took place in only one facility. A greater and more diverse sample size would have allowed for more definite conclusions to be made. Therefore, this study may be viewed as a pilot study for future research in the US.

Conclusion

In conclusion, this study contributed to nursing knowledge in regard to the nursing practice and perceptions of IDC in the hospital setting. It was the first study to focus on this aspect in the US. This study revealed IDC was accepted and promoted as best practice, but the definition and process is still unclear, supporting previous findings. The study highlighted the addition of computerized medication administration records had been seen as a major advantage in the process as a whole as well as increasing nurse knowledge of the information.

Future Implications and Recommendations

In the future, the information from this study may be used in clinical practice to promote strategies to create a policy or guideline that clearly defines the process of IDC. Additional studies should focus on observational methods in order to view the nurse's actual practice of IDC. Having a universal definition will assist in clarity of the process and in turn, promote ensuring safe administration of high alert medications to patients.

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Appendix A: Flier

Research Participants



Needed!



Research study is focused on exploring Registered Nurses' perceptions and practice of "Independent Double Checks" of high-alert medications

RNs from any patient care unit are invited to participant in a brief interview on the topic

Interested participants may contact:

Danielle Grant
UNH Nursing Student
DDQ23@wildcats.unh.edu
(978)-726-1578

Or

Sue Fetzer RN PhD
Nurse Researcher at SNHMC
Sue.fetzer@snhhs.org

Appendix B: Demographic Results

Gender	#
Female	12
Male	1

Highest Educational Level in Nursing	#
Diploma	2
Associate	4
Baccalaureate	7

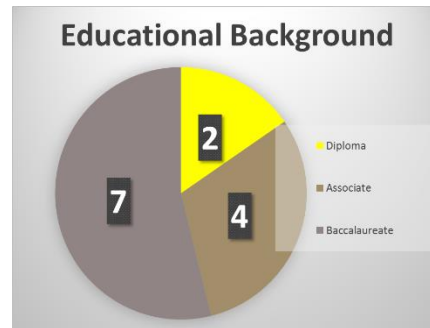
Year Graduated	#
1982	1
1989	1
2003	1
2004	2
2005	1
2007	2
2011	1
2012	1
2013	2
2014	1

Total Years Practicing	#
1 year or less	3
3 years	2
7 years	2
9 years	1
10 years	2
11 years	1
25 years	1
32 years	1

Work Commitment	#
Full Time	11
Part Time	1
Per Diem	1

Shift	#
Day	11
Evening	1
Rotating	1

Setting	#
Medical Surgical	13



Appendix C: Informed Consent

Dear Nurse,

We are conducting a study to understand the experiences of registered nurses involved in administering high-risk medications. If you agree to participate in this study, you will be asked to participate in an audio-taped interview with a researcher which may last up to an hour. You will be asked not to identify yourself by name on the tape. After transcription, audiotapes will be destroyed to maintain confidentiality. The transcript will not contain any identifying information, so documents derived from the data will also ensure anonymity. The data will be examined to identify patterns to generate themes and sub-themes. The results will be used to stimulate ideas for improvement of the independent double check process. In addition, you will be asked to complete a demographic questionnaire. Participation is voluntary and anonymous, and you may leave at any time.

It is estimated that 20 nurses will be interviewed for the study. This study involves minimal risk due to the nature of the topic. If you agree to participate and then change your mind, you may withdraw at any time during the study without penalty. Data will be kept in a locked file, available only to the researchers.

You will not receive any additional compensation for your time, other than your regularly hourly wage. Benefits of the study include the opportunity to share perceptions on independent double checks in practice and the ability to offer ideas to provide improvements for the independent double check process.

The study has been approved by the SNHMC Institutional Review board. If you have any questions about this research project or would like more information before, during or after the study, you may contact Dr. Susan Fetzer at sue.fetzer@snhmc.org. If you have any questions about your rights as a research subject, you may contact Lisa Bonneau in the SNHMC IRB Office at 603-577-2963 to discuss them.

I have read and fully understand the purpose of this research project and the risks and benefits it presents to me as stated above.

I, _____ CONSENT/AGREE to participate in this research study.

Signature of Subject

Date

Appendix D: Demographic Questionnaire

Please fill in the answers below.

1. What is your gender?
 Male Female

2. What is your highest level of nursing education?
 Diploma
 Baccalaureate
 Master
 Doctorate

3. In what year did you graduate from your primary nursing school? _____

4. How many total years have you been practicing nursing? _____ years

5. What is your work commitment?
 Full-time
 Part-time
 Per-diem

6. What shift do you primarily work?
 Day (8 or 12 hours)
 Evening (8 or 12 hours)
 Night (8 or 12 hours)
 Rotating

7. What is your primary hospital work setting?
 Behavioral Health
 Emergency Department
 Immediate Care
 Pediatric Services
 Medical-Surgical Services
 ICU
 Other: (Please describe): _____

Thank you!

Adapted from:

Mrayyan, M., Shishani, K., & Al-Faouri, I. (2007). Rate, causes and reporting of medication errors in Jordan: nurses' perspectives. *Journal Of Nursing Management, 15*(6), 659-670. doi:10.1111/j.1365-2834.2007.00724.x

Appendix E: Focused Interview Guiding Questions

To be used to begin and guide discussion. Informal conversation and exploration of the perceptions is preferred.

- What do you currently understand is the meaning of IDCs prior to administration of high-alert medication?
- How do you currently double-check medications?
- What are the advantages of double-checking?
- What are the disadvantages of double-checking?
- What are the factors that make it easier to double-check medications?
- What are the factors that make it more difficult to double-check medications?
- Is there any other information you would like to share with me that we have not already covered?

Adapted from:

Dickinson, A., McCall, E., Twomey, B., & James, N. (2010). Paediatric nurses' understanding of the process and procedure of double-checking medications. *Journal Of Clinical Nursing*, 19(5-6), 728-735. doi:10.1111/j.1365-2702.2009.03130.x