First-Time Parents' Knowledge of Newborn Suctioning

Megan Elise Breland

Follow this and additional works at: https://louis.uah.edu/honors-capstones

Recommended Citation
Breland, Megan Elise, "First-Time Parents' Knowledge of Newborn Suctioning" (2016). Honors Capstone Projects and Theses. 76.
https://louis.uah.edu/honors-capstones/76

This Thesis is brought to you for free and open access by the Honors College at LOUIS. It has been accepted for inclusion in Honors Capstone Projects and Theses by an authorized administrator of LOUIS.
First-time Parents’ Knowledge of

Newborn Suctioning

by

Megan Elise Breland

An Honors Capstone

submitted in partial fulfillment of the requirements

for the Honors Certificate

to

The Honors College

of

The University of Alabama in Huntsville

April 29, 2016

Honors Capstone Director and Advisor: Ellise D. Adams PhD, CNM, College of Nursing

Student __________________________ Date 4-25-16

Capstone Director ______________________ Date 4-25-16

Department Chair __________________________ Date 4/27/2016

Honors College Dean __________________________ Date 4/27/16
Honors Thesis Copyright Permission

This form must be signed by the student and submitted as a bound part of the thesis.

In presenting this thesis in partial fulfillment of the requirements for Honors Diploma or Certificate from The University of Alabama in Huntsville, I agree that the Library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by my advisor or, in his/her absence, by the Chair of the Department, Director of the Program, or the Dean of the Honors College. It is also understood that due recognition shall be given to me and to The University of Alabama in Huntsville in any scholarly use which may be made of any material in this thesis.

Megan Breland

Student Name (printed)

Megan Breland

Student Signature

4-28-16

Date
Acknowledgement

The author would like to gratefully acknowledge the assistance and friendship of CLEAR Project team members: Pamela O’Neal PhD, RN; Casey Norris MSN, CNS; Angela Ayers RN, BSN; Brandi Harbin, RN, BSN; Linda Hanson; and Rebecca Stillwell. She would also like to especially thank her mentor, Dr. Ellise Adams, for the countless hours of editing and emails, caring support, and constant encouragement. This honors research was funded in part by the Research and Creative Experience for Undergraduates at the University of Alabama in Huntsville in the summer of 2015.
# Table of Contents

Abstract ................................................................. 4  
Introduction ............................................................ 5  
  Significance ........................................................... 6  
  Guidelines ............................................................ 7  
Review of Literature ................................................... 8  
  Effects of Suctioning ............................................... 8  
  Physiologic Outcomes of Suctioning on the Newborn .......... 11  
  Suctioning Debate .................................................. 12  
  Theoretical Framework ............................................ 13  
  Parents’ Learning Needs .......................................... 14  
  Summary ............................................................. 15  
Methods ................................................................. 16  
  Instrument Development ........................................... 16  
  Research Design .................................................... 17  
Results ................................................................. 17  
  Demographics ....................................................... 17  
  Pre- and Post-Test .................................................. 18  
Limitations ............................................................. 19  
Discussion .............................................................. 20  
  Instrument Development .......................................... 20  
  Major Findings ...................................................... 20  
    Indications ......................................................... 20  
    Methods ............................................................ 21  
    Cleaning ........................................................... 22  
    Storage ............................................................. 22  
    Practices which could cause newborn harm corrected in teaching ... 23  
  Implications for nursing practice ................................ 24  
  Implications for future research .................................. 25  
    Strengthening the instrument ................................... 25  
    Refining the teaching script .................................... 26  
    Future studies ................................................... 27  
Conclusions .......................................................... 27  
Dissemination ......................................................... 27  
References ............................................................ 29  
Appendix A: Consent form ........................................... 33  
Appendix B: Pre-test .................................................. 35  
Appendix C: Teaching outline ....................................... 40  
Appendix D: Post-test flyer ......................................... 42  
Appendix E: Post-test ................................................ 43  
Appendix F: Institutional Review Board Approval Letter ........... 47  
Figure 1: Pre- and Post-test Response Changes .................... 48
Abstract

**Background:** The practice of newborn suctioning is poorly defined. First-time parents are novices in newborn care and may not be instructed on proper use of the blue bulb syringe. Improper suctioning may result in choking, decreased heart rate, and risk for infection. The purpose of this non-experimental, pretest/posttest, pilot/feasibility study is to assess first-time parents’ learning by determining the relationship between scores on a pre-test and post-test following a teaching intervention concerning bulb suctioning indications, methods, cleaning, and storage.

**Methods:** First-time parents were recruited from a community-based breastfeeding education and support group. After consenting, seven participants completed a pre-test on indications, methods, cleaning, and storage of the blue bulb syringe. The principle investigator then presented a teaching intervention about the four topics on the pre-test. Participants then received a flyer directing them to complete the online post-test identical to the pre-test.

**Results:** Teaching proved effective in educating parents against unsafe practices such as suctioning the back of the throat and closing one nostril to suction the other. The mnemonic “‘M’ before ‘N,’ mouth before nose,” was useful in helping parents remember the correct order for suctioning. This population sees the main use of the bulb syringe is clearing secretions.
Introduction

Sometimes practices can become so commonplace that they are routinely implemented even when no supporting evidence exists. The practice of using a bulb to suction the newborn has become routine despite lack of evidence on the long-term outcomes, reasoning behind why this tool is used, or if infants even need assistance clearing their airways. The correct procedure for using the bulb syringe could be presumed to be self-evident, but the accidental, improper use of this medical device could cause harm to the infant. Oropharyngeal suctioning of secretions in neonatal airways is a routine practice worldwide (Kelleher et al., 2013), though research to support or refute this practice does not exist (Perlman et al., 2010). The recommendation to suction all neonates following birth with a catheter attached to continuous wall suction was removed from the Neonatal Resuscitation Program (NRP) guidelines in 2006 and replaced with a recommendation to selectively wipe or suction with a bulb syringe in infants born through clear amniotic fluid and those born through meconium-stained amniotic fluid (MSAF) (Kattwinkel et al., 2010). For the purposes of this study, “suctioning” will refer to removal of secretions with a bulb syringe from the newborn’s mouth and nose.

First-time parents are not instructed on proper suctioning practices for their newborns (McCartney, 2000). Improper suctioning techniques may result in the infant choking, eliciting a vagal response, and increased risk for infection (Kelleher, 2013). If the back of the throat is suctioned, the infant could gag and choke and a vagal-induced episode of bradycardia could be elicited (Pocivalnik, 2015). If the bulb syringe is compressed once it is inside the infant’s mouth or nose, the air forces the mucus further back, making it harder to suction and potentially forcing the mucus into the Eustachian tubes of the ears, causing an infection. Parents are routinely sent home from the hospital following the birth of an infant with a blue bulb syringe, but little if any instruction is provided on proper use. However, the lack of instruction could be due to a lack of
available information to teach; a thorough review of nursing, obstetric, and parental literature failed to reveal consistent, evidence-based guidelines (O’Neal et. al., 2016). A review of infant-care books sold at a national book retailer revealed that most included brief, inconsistent instructions on suctioning, if any. However, one source recommended leaving the bulb syringe at the hospital and not using it in the home setting at all (Brown & Fields, 2013). The blue bulb syringe is a common household item in families with infants and young children and parents routinely use it to suction secretions from children’s mouths and noses. Surprisingly little information regarding the bulb syringe is available to the parents considering its widespread use and the large number of suction devices available on the market.

The purpose of this study was to determine the relationship between scores on a pre-test and scores on a post-test in first-time parents of newborns when instruction related to bulb suctioning indications, methods, cleaning, and storage was provided. The research question that guided this study was “what is the relationship between scores on pre-test and scores on post-test in first-time parents’ of newborns when instruction related to bulb suctioning indications, methods, cleaning, and storage is provided?” The researcher hypothesized that the parents would score higher on the post-test than the pre-test, given that they had received information on the topics covered on the test.

Significance

Determining the best practices for neonatal oronasopharyngeal suctioning is important because it is a largely unstudied topic. It is used by well-intentioned healthcare providers immediately following birth as a routine practice without scientific validity. Some of the unsubstantiated reasons for bulb suctioning include removing pulmonary fluid in the trachea, clearing small air passages so air can enter, preventing aspiration of blood and mucus with onset
of respirations, and providing tactile stimulation to assist in respiration initiation (Waltman et al., 2004). Oropharyngeal suctioning can cause bradycardia, especially if the suctioning event is prolonged and has shown no effect on reducing the incidence of meconium-aspiration syndrome (Kattwinkel et al., 2010; Perlman et al., 2010).

Following birth in the hospital setting, nurses are the healthcare providers who spend the most time with the newborn and must rely on their clinical judgement make the decision as to when the newborn needs suctioning, whether it should be performed routinely or only when certain indications are present. Nurses need evidence-based guidelines, as well as institutional policy, to aid in identifying when the newborns in their care require oronasopharyngeal suctioning with a bulb syringe (Czarnecki, 1999). Firm evidence of the effectiveness and safety of intrapartum suctioning is lacking, despite its common use in clinical practice (Vain et al., 2004).

**Guidelines**

The 2010 neonatal resuscitation guidelines are the most recent statements published by the American Heart Association concerning newborn suctioning. “although the guidelines for neonatal resuscitation focus on delivery room resuscitation, most of the principles are applicable throughout the neonatal period and early infancy” (Perlman et al., 2010), meaning that the suctioning practices in the hospital setting can be used by parents once they take the infant home. One of the initial steps in neonatal resuscitation is to clear the airway, using a bulb syringe or suction catheter, “if necessary” (Kattwinkel et al., 2010). “Routine intrapartum oropharyngeal and nasopharyngeal suctioning for infants born with clear or meconium-stained amniotic fluid is no longer recommended” (Perlman et al., 2010). Rather, suctioning should be used with discretion on babies with obvious obstructions to spontaneous breathing or who need positive-
pressure ventilation (Kattwinkel et al., 2010). No evidence supports or refutes the suctioning of the mouth and nose of depressed babies born through clear amniotic fluid, but suctioning of healthy infants is correlated with cardiorespiratory complications (Perlman et al., 2010). The Neonatal Resuscitation Program guidelines state that suction pressures should not exceed 100 mmHg of negative pressure because of the risk of “potentially fatal injuries to the oral-pharyngeal airway” (Alur et al., 2011). The 100 mmHg recommendation was made in reference to continuous suction, but it can be safely applied to bulb suctioning as well (Alur et al., 2011). Suctioning even with a bulb syringe may exceed this pressure recommendation, and even more so in the high-stress environment of an infant resuscitation. The smaller the bulb, the higher the pressures generates, but larger bulbs may be too big to use with premature infants (Alur et al., 2011). In summary, suctioning with a bulb syringe is not recommended as a routine practice and the bulb syringe may generate higher suction pressures than the safety recommendations.

Review of Literature

A computerized search of CINHAL Plus with Full Text was performed using the key terms oropharyngeal suction, bulb, newborn, neonate, and birth. The search included the years 1971-2015 and was limited to articles in English, which resulted in the identification of twenty-six relevant articles. Included in this review of literature is a summary of the 2010 neonatal resuscitation guidelines for suctioning, twelve primary studies that investigated the effects of suctioning at birth, and a theoretical framework connecting suctioning practices to new parents’ knowledge attainment.

Effects of Suctioning

Four studies compared the effects of suctioning and no suctioning immediately following birth. Kelleher et al. (2013) investigated the question, “is wiping alone sufficient to clear the
airways and provide stimulation to initiate respiration without the potential adverse effects associated with suction?” and hypothesized that respiratory rates would differ by fewer than four breaths per minute between suction and wiping groups. Suctioning or wiping was performed by the resident physician immediately after the cord was cut and nurses documented respirations within the first hour and at eight, sixteen, and twenty-four hours after birth. The researchers concluded that wiping the newborn’s mouth and nose yields equivalent clinical results to oronasopharyngeal suctioning at birth in regard to respiratory rate in the first twenty-four hours (Kelleher et al., 2013).

Waltman et al. (2004) hypothesized that there is no significant difference between suction and no suction groups in Apgar scores, heart rate, and arterial oxygen saturation in first twenty minutes of after birth. Infants were randomized to the suction or no suction group shortly before birth by researcher and the resident physician was informed. The nursery nurse present at the birth recorded the Apgar scores and minute-by minute heart rate and oxygen saturation were recorded for first twenty minutes after birth with a reusable neonatal saturation sensor and electrodes to verify heart rate reading on sensor. The results showed statistically, but not clinically significant differences between the two groups in heart rate and oxygen saturation because both were within normal limits. The suction group took longer to reach 92% oxygen saturation, but at ten minutes, the trend reversed and the suction group showed higher saturation. The differences in the outcomes of suctioned and non-suctioned infants is not clinically significant to warrant the routine intervention of bulb suctioning.

In Gungor et al.’s (2005) study of normal, term, vaginally born infants, he investigated the effects of oronasopharyngeal suctioning compared to no suctioning. The suctioned group took longer to attain an Apgar score of 10 and an oxygen saturation of 92%. Oxygen saturation levels
gradually increase in the first minutes of life regardless of suctioning, which could be a result of the persistence of the right-to-left shunt of blood through the heart. The findings of this study seem to indicate that rapid removal of fluid is not necessary for timely transition from placental to lung perfusion. The researchers concluded that no statistical or physiologic basis exists for routine suctioning in healthy, term, vaginally born infants.

Gungor et al. (2005) also conducted a study concerning suctioning in normal, term infants born by elective cesarean section. This study asked, “Does oronasopharyngeal suction lead to an improvement in respiratory function of healthy, term newborn infants delivered by cesarean section compared with the outcomes of no suction?” (Gungor et al., 2005). The infants were randomized to oronasopharyngeal suction or no-suction group by random numbers in a sealed envelope in the operating room following onset of maternal general anesthesia. No suction resulted in achieving 92% oxygen saturation and an Apgar score of 10 sooner than the suctioned group. The conclusions of this study support that newborns are oxygen desaturated immediately following birth regardless of suctioning. Higher Apgar scores in the no-suction group than the suction group may indicate that peripheral perfusion is more rapid in the no suction group. Results from this study are consistent with previous studies of vaginally born infants, which indicate that birth method does not affect oxygen saturation right after birth (Gungor et al., 2005), so differences in oxygen saturation may be relevant to the suctioning procedure. It would seem that suctioning would afford a greater advantage to infants born by cesarean since they have not undergone the process of labor to remove fluid from potential airspaces, but no studies have supported this view (Gungor et al., 2005).
Physiologic Outcomes of Suctioning on the Newborn

Foundational research on neonatal suctioning was completed in 1971 by Codero and Hon. They made the connection between nasopharyngeal suctioning and vagal-induced bradycardia. Comparing nasogastric suctioning (n=46) with the bulb syringe (n=41), no infants suctioned with only the bulb syringe experienced bradycardia since “the bulb cannot usually reach the larynx and trachea, areas recognized as very sensitive triggers of vagal responses” (Codero & Hon, 1971). At one minute some of the infants experienced bradycardia with nasogastric suction, but at five minutes, none of the infants had a vagal response, suggesting that they were more physiologically stable at five minutes than at one. This study was the first to investigate vagal-induced bradycardia from suctioning. It is still being cited as evidence for bulb suctioning.

Pocivalnik et al. (2015) studied the effect of oropharyngeal suctioning on cerebral and peripheral tissue oxygenation. The researchers hypothesized that oropharyngeal suctioning impairs the increase of cerebral and peripheral tissue oxygen saturation during immediate transition after birth by elective cesarean with obstructive matter in the airway (Pocivalnik et al., 2015). There were no significant differences in cerebral or muscle tissue oxygenation values and no periods of bradycardia or apnea in suctioned group. Previous studies found higher heart rates and faster increase of oxygen saturation in non-suctioned infants, but this study only used oral suctioning, not nasal, which could account for the difference. Pocivalnik et al. (2015) concluded that even though no differences in oxygenation were found, infants should not be routinely suctioned, in accordance with the neonatal resuscitation guidelines.

Carrasco et al. (1997) examined the effectiveness of oropharyngeal suctioning at birth with a bulb syringe on arterial oxygen saturation. The oxygen saturation was measured by pulse
oximetry for the first twenty minutes of life and the umbilical cord was clamped before the first
breath so umbilical artery blood could be collected and measured. The average oxygen saturation
in the suction group was lower than the no suction group and took longer to reach 92%, but no
differences in the pH or umbilical arterial blood gases was noted. Unlike the Gungor et al. (2005)
study, Carrasco et al. (1997) proposed that suctioning was beneficial in the presence of
meconium-stained amniotic fluid, but the two agreed that suctioning was of no benefit as a
routine practice for vigorous newborns.

Suctioning Debate

Intrapartum bulb suctioning is a common occurrence, but some nurses and researchers
question the practice. Czarnecki and Kaucic (1999) noticed that bulb suctioning is often left to
the discretion of the nurses without guidelines for when and how often suctioning should be
performed. They investigated parameters nurses identified as indications for suctioning,
 improvement of these parameters following suctioning, and whether there was a relationship
between the two. The results of the study showed that nurses most often identified audible
secretions, presence of visible secretions, and decrease in pulse oximeter readings as indications
for suctioning, and these three were the only parameters that significantly improved post-
suctioning (Czarnecki & Kaucic, 1999). The findings “suggest that nurses are correct in the
assessment data they use when deciding whether or not to suction an infant,” (Czarnecki &
Kaucic, 1999), yet standardization of indications is still needed. Members of the Perinatal
Nursing List electronic forum voiced concern that “evidence to support the efficacy of suctioning
is not available in the literature” (McCartney, 2000). They also expressed a desire that parents
receive education when given a bulb to take home on when and how to suction and how to clean
the bulb.
Theoretical Framework

In 1982 Patricia Benner published her theory of how nurses learn and progress through the levels of clinical decision making. The ideas presented in her article *From Novice to Expert* (Benner, 1982) apply to anyone making decisions regarding another person’s healthcare, including nurses, physicians, and respiratory therapists. The theory states that nurses progress through five levels of clinical proficiency: novice, advanced beginner, competent, proficient, and expert. Benner’s theory relates directly to how nurses make clinical judgements regarding indications that a newborn requires suctioning. Novice and advanced beginner nurses would need a list of indications to suction and would only do so if it was included in their list of tasks. Oronasopharyngeal bulb suctioning “has been a routine part of the initial management of the normal, term newborn for many years” (Waltman et al., 2004, p. 32), and as a result, many competent level clinicians and nurses may continue to use suctioning in practice, merely as a matter of habit, even though it is not evidence-based. At the competent level of nursing, reverting to the standard routine feels safe and right. Proficient and expert nurses would rely more heavily on their own experience as to whether a newborn should be suctioned. The level of practice of the nurse will largely influence her or his decision of when a newborn requires suctioning.

Benner’s theory also applies to how parents learn about suctioning for their infant, since they are essentially performing the same functions as a nurse at home related to choices of when and how to suction. At first they need very clearly delineated guidelines for the indications for suctioning, the proper method for how to suction, how to clean the bulb, and where to store it. They can gain this knowledge by watching nurses in the hospital setting as well as written and verbal instruction. As parents reach the competent level, they understand to suction under a certain set of circumstances, but as they become more proficient, they are able to use experience
when the infant needs suctioning or could benefit just as much from wiping the nose or thinning secretions with saline. First-time parents would fall under the categories of novice and advanced beginners initially, and with time and subsequent children, move toward the levels of competent, proficient, and expert.

Parents’ Learning Needs

In a study by Svensson, Barclay, and Cooke (2006), expectant and new parents were asked to identify some of their concerns and interests regarding caring for their newborn infants. They reported “perceiving achievement or failure,” “needing to know what is normal,” and “needing help to perform well” (Svensson, Barclay, & Cooke, 2006, p. 21) as three of their concerns. The researchers specifically applied these areas to prenatal education classes, but they are also applicable to education parents receive regarding bulb suctioning. Parents need to know what normal secretions from an infant’s mouth and nose look like in order to distinguish from excessive secretions to determine when suctioning is needed. They need to know the proper procedure for suctioning in order to perceive that they have achieved the desired results and performed it well.

A review of infant care books available to parents at a national bookstore showed that parents have very little information about the bulb syringe and suctioning, and the information that is available is often contradictory (O’Neal et. al., 2016). Some books advocated loosening secretions with saline and suctioning every few hours, while others warned that excessive suctioning could cause irritation to the mucus membranes in the nose. Books that did contain information on suctioning had only a few sentences and none had a full section devoted to its use, and several contained no information on suctioning at all. Babies 411 (Fields & Brown, 2013) advocated “leaving the bulb at the hospital,” and personal communication with the author
revealed that this recommendation was based on “twenty years personal experience in general pediatrics.” Ari Brown, MD, FAAP (personal communication) felt that suctioning could become “a minor obsession with parents who are continually trying to remove snot from a child's nose.” She reported an instance of an apneic event in a child whose mother had “shot air INTO the infant’s nose when she failed to depress the bulb syringe and remove the air prior to trying to aspirate the infant's nasal secretions.” One of the top results when searching “bulb syringe” on the Internet is Dr. Nasal Aspirator.com (drnasalaspirator.com). The site contains various articles related to suctioning indications, methods, and cleaning. When asked for sources, Dustin Robins, CEO of Dr. Nasal Aspirator (personal communication), replied that he was a father of four, has been selling nasal aspirators for six years, and has friends who write content for his site. As the aforementioned examples indicate, parents are not receiving consistent, reliable information regarding the bulb syringe and suctioning of their infants.

**Summary**

After completing the review of literature, it was evident that while some research exists on suctioning in the intrapartum setting, no studies were found involving parents in the home setting. This discovery was surprising since new parents are sent home from the hospital with a bulb syringe without standardized instructions for its use. The gap in the literature regarding parent’s knowledge of suctioning their newborns with the bulb syringe prompted the development of this study. The goal of the present study was to ascertain what parents already knew about suctioning and what they learned following an interactive instructional session regarding proper indications, use, cleaning, and storage of the bulb syringe.
Methods

The research question that guided this study was “what is the relationship between scores on pre-test and scores on post-test in first-time parents’ of newborns when instruction related to bulb suctioning indications, methods, cleaning, and storage is provided?” Participants for the study were recruited at a community-based breastfeeding support group and education class. Criteria for participation included first-time parents between the ages of 19 and 50, male or female, able to speak and read English, any ethnicity, any educational level, and any socioeconomic status. The target sample size was between 8 and 24 participants. The study was conducted in a metropolitan city in the southeastern United States at a privately owned infant supply store where a breastfeeding support and education group meets bi-weekly.

After obtaining consent (Appendix A, Consent Form), participants were given a twelve-item multiple choice, multiple response pre-test (Appendix B, Pre-test). The test included a demographics section and then a section on indications, methods, cleaning, and storage of the blue bulb syringe, with each section containing three questions. Following completion of the pre-test, the principle investigator presented a short lesson on each of the four topics covered on the pre-test (Appendix C, Teaching Outline). At the end of the class, participants were given a flyer (Appendix D, Post-test Flyer) and asked to go to the website listed to complete the post-test electronically (Appendix E, Post-test). The post-test included the same twelve questions as the pre-test, excluding the demographics section.

Instrument Development

The researcher developed a twelve-item, multiple-choice instrument to use as a pre- and post-test. A database of seventeen nursing and midwifery texts was compiled that contained any information presented in the text on indications, method, cleaning, or storage of the blue bulb
syringe or other suctioning device. The researcher also made a database of eighteen infant care books sold at a national retailer with the same categories as the nursing texts database. Since no objective research exists on these topics, the consensus of the information from the databases was used in outlining the teaching script used in the study. The pre- and post-test instrument was designed to assess the participants’ knowledge and learning. Each item had one or multiple answers that were considered “correct” based on the information from the nursing texts and infant care books presented in the teaching. The instrument was reviewed by a team of seven pre-nursing, experienced nurses and nursing faculty for content clarity and appropriateness.

Research Design

The twelve-item, multiple-choice instrument was used as both a pre- and post-test. The instruments included sections on indications, methods, cleaning, and storage with each section containing three questions. The pre-test was administered to each participant on paper, but since the breastfeeding education class only met once, the post-test was administered electronically in hopes to capture the essence of learning and not short term memory. The questions on the instrument were designed to assess what the parents learned in the teaching session. The options included recommended suctioning behaviors as well as commonly held misconceptions concerning use of the bulb syringe (Appendix B, Pre-test; Appendix C, Post-test). The study was approved by the Institutional Review Board at the University of Alabama in Huntsville (Appendix F).

Results

Demographics

All participants (n=7) met the inclusion criteria of the study, having only one infant. The participants for the study ranged in ages from 21 to 30 years old, with modes of 24 and 29, and
all were female, with the exception of one. Caucasians made up 85% of the sample. Three participants were expectant first-time parents and were between 36 and 39 weeks gestation. Four participants already had one child ranging in ages from 20 to 30 months. All participants had at least a high school diploma or GED, five had associates or bachelor degrees and one held a masters’ degree. Only one participant had prior training in healthcare. Five participants had previously attended a childbirth (n=4), parenting (n=1), or breastfeeding class (n=3).

Pre- and Post-Test

All participants completed the pre-test (n=7), but only five completed the electronic post-test (n=5). On the pre-test, no participants indicated they would suction if the infant was choking, but after teaching, 43% said they would suction in this scenario. Slow breathing and difficulty breathing were selected as indications for suctioning 14% and 29%, respectively, before teaching, but on the post-test 43% selected suctioning for slow breathing and 57% for difficulty breathing. No participants initially reported that they would suction their infant if he or she displayed a change in skin coloring, but after teaching, 43% indicated that infant cyanosis would lead them to suction their child. When asked about how long they planned to suction on the pre-test, 14% indicated they would suction only as long as the infant would tolerate it, but on the post-test, those selecting this response increased to 57%. Before teaching, 43% of participants knew to suction the infant’s mouth before the nose, but following instruction, 100% indicated they knew to suction the mouth first. Initially 14% thought that one nostril should be occluded to suction the other nostril and that they should suction the back of the infant’s throat, but after teaching, no participants indicated they believed these were appropriate action. On the pre-test, 57% chose to position the infant on his or her back for suctioning, but after teaching, all participants chose this position.
When asked about indications for cleaning the bulb syringe on the pre-test, 43% responded they would clean the bulb when the infant had been sick and was now well and 29% would clean when the bulb was visibly soiled, but on the post-test all participants selected both of these options as indications for cleaning. If the bulb was dropped on the floor, 29% indicated on the pre-test that they would clean it, but on the post-test, this number increased to 80%, and if the bulb had been in the bottom of the diaper bag, 29% initially indicated they would clean it, but following teaching, all participants chose this option as a reason to clean the bulb. Prior to instruction, 86% of respondents chose to clean the bulb with water only, while 29% chose to clean with soap and water. After teaching, the numbers reversed and 60% indicated they would clean with water only and 100% said they would clean with soap and water (Figure 1).

Limitations

This study was a pilot and feasibility study. Along with measuring parents learning, it began validity testing of the instrument developed by the researcher and determined how feasible it is to use the instrument as a pre- and post-test along with a teaching intervention. The sample size in the study was very small, only consisting of seven participants. With this sample size, it is impossible to run t-tests to determine significant differences between pre- and post-test results. Criteria for participation included first-time mothers and fathers, but only one father participated, causing the results to heavily reflect the knowledge of first-time mothers. There was also only one study participant who was not white/Caucasian, causing the results to not be generalizable to a diverse population.

The response rate for the pre- and post-tests was unequal. Seven participants completed the pre-test, but only five completed the post-test. One reason for this lack of completion could have been the different format of the post-test. It was administered in an online format and
required participants to remember to access it after leaving the class, since the class only met once. Ideally, the post-test would be administered on paper just like the pre-test at a later date.

**Discussion**

**Instrument Development**

The principle investigator developed the twelve-item, multiples choice instrument used for the pre- and post-test in the study. Participants completed the demographics portion only once, on the pre-test. The purpose of the demographics section was to determine the participants’ background, from which they gained prior knowledge. Specifically, the education portion of the demographics section was to evaluate where participants existing knowledge of suctioning practices had been acquired. The majority of the subjects were female, Caucasian, with at least a high school diploma and had given birth to only one child.

The second section of the instrument consisted of questions regarding indications and methods for suctioning and, cleaning and storage of the bulb syringe. The item choices that were considered “correct” in data analysis were compiled from the consensus of infant care books and nursing texts reviewed by the principle investigator. One example is the depth to insert the bulb into the infant’s mouth or nose. No specific recommendation exists in the literature, but the consensus from the books is to insert it no further than 1 inch into either side of the mouth and ¼ inch into the nostrils. It is important to note that patient teaching remains inexact and variable when a standardized set of practice guidelines do not exist for neonatal suctioning.

**Major Findings**

**Indications.** This population determined that the main use of the blue bulb syringe is for clearing secretions from the infant’s mouth and nose. The majority of participants responded that they would use the bulb syringe until the infant could blow his or her own nose or when the infant is having difficulty breathing due to nasal congestion. Interestingly on the pre-test, no
participants selected choking as an indication for suctioning, but on the post-test, 60% selected choking, indicating a change in knowledge. This response is different from what the investigators expected since they thought of choking as a main indication for oral suctioning. It is important to note that all participants of this study could have been provided instruction regarding newborn suctioning during hospitalization for childbirth. However, if this teaching occurred, appropriate information was either not communicated or maintained. In future studies, it will be important to capture demographic data regarding place of birth and teaching by nursing staff during hospitalization regarding newborn suctioning.

The teaching intervention made a definite impact on the participants’ knowledge of indications for suctioning, with an increase in participants from the pre- to the post-test responding that they would suction in the event of bradypnea, dyspnea, and cyanosis. On the post-test, twice as many participants selected dyspnea as an indication and 60% selected cyanosis, compared with 0% on the pre-test.

Methods. The teaching intervention was effective in educating the participants to suction the mouth before the nose. The mnemonic “‘M’ before ‘N’, mouth before nose” was utilized in teaching and its effectiveness in helping the participants remember the correct order was demonstrated on the post-test with 100% responding that they would suction the infant’s mouth first. On the pre-test only 57% of participants chose to position the infant on his or her back for suctioning, but on the post-test, all participants responded that they would place the infant on his or her back. Even though the teaching intervention did not specifically include any direction on positioning, the change in responses on the post-test could be related to the principle investigator’s demonstration of suctioning on an anatomically correct model infant, with the infant lying on his back in the investigator’s lap.
**Cleaning.** Even before teaching, all participants responded that they would clean the bulb immediately following using it to suction the infant, and the majority indicated they would use plain water to clean the bulb. Based on the consensus of the infant care books, the teaching intervention recommended using soap and water, so the number of participants who selected that they would use soap and water for cleaning increased on the post-test. On the pre-test, 86% of participants indicated they would clean the bulb with clean water, and only 29% said they would use soap, but on the post-test, the trend reversed and 100% of participants responded that they would use soap, while only 60% would use water alone. During the teaching intervention, the primary investigator stated that no firm evidence exists in the best way to clean the bulb syringes and stated that most sources instruct to clean the bulb with soap and water. The overlap in responses on the post-test most likely reflects the ambiguity presented in the teaching. However, teaching was effective in educating parents that the current recommendation for cleaning the bulb syringe is using soap and water.

The indications for when to clean the bulb, including when the infant had been sick and was now well, when the bulb was visibly soiled, when the bulb was dropped on the floor, and when the bulb had been in the bottom of the diaper bag, were specifically addressed in the teaching intervention. On the post-test all participants selected all of these options as proper indications that the bulb needed to be cleaned, except that only 80% indicated they would clean the bulb after it was dropped on the floor. The participants showed an increase in knowledge following the teaching intervention in this category.

**Storage.** The study participants selected fewer locations in which to keep the bulb syringe on the post-test. The majority on both the pre- and post-test reported that they planned to keep a bulb syringe in the bedroom, presumably so it would be near the infant. The teaching
intervention mentioned possible locations for keeping a bulb syringe including the infant’s room, the diaper bag, the medicine cabinet, bathroom, or kitchen. It was recommended to keep a bulb near the infant at all times, but left it up to the parent how many bulbs to have. However, if parents understood the importance of suctioning in preventing choking, they would likely have more bulb syringes to keep near the infant at all times. The population sees the main purpose of suctioning is for clearing secretions and not for relieving choking behaviors. It is important for larger studies to be performed to better determine the indications for newborn suctioning. Once these indications are better identified, the prenatal teaching provided to new parents can be standardized and more effective.

**Practices which could cause newborn harm corrected in teaching.** Following the teaching intervention, that included the instruction, “do not close one nostril while suctioning the other,” no participants indicated that they would perform this action. Since newborns are obligate nose-breathers (Olds’, 2016), they have little means of respiration if both nostrils are occluded during the suctioning event. “Although many term newborns can breathe orally when nasally occluded, nasal obstructions can cause respiratory distress” (Olds’, 2016, p. 654-655).


The teaching intervention also included instruction against suctioning the back of the infant’s throat since it could cause a vagal response with resulting decreased heart rate and blood pressure. Once again, on the post-test, no participants indicated they would suction the back of the throat. These findings indicate that teaching was effective in educating these parents to avoid unsafe practice.
Implications for Nursing Practice

The results of this study have direct implications on nursing practice regarding what parents need to be taught about the indications for suctioning, and the use, cleaning, and storage of the blue bulb syringe. It appears that parents keep only one or two bulb syringes on hand because they are cleaning and reusing the bulb. With the research currently lacking on how to clean the bulb and how long parents can safely keep and reuse it, the importance of cleaning the bulb after every use is the priority to teach parents. New research by Hanson (2016) suggests that triclosan, the active ingredient in some liquid dish detergents, is not effective at killing bacteria found in the bulb syringe, including *E. coli* (Leahy, O’Neal, & Adams, 2015). This finding “suggests [that the] current protocol of washing the bulb syringe in warm soapy water may not be sufficient” (Hanson, 2016, slide 14).

Parents need to understand the importance of keeping a bulb near the infant at all times in case of a choking event, not only at home but also when traveling. In order to emphasize this importance, parents must first understand that choking is a primary indication for using the bulb syringe.

Following teaching, 80% of participants indicated that they planned to suction until their infant would no longer tolerate it. This change is directly correlated to the recommendation in the teaching intervention. Nurses need to teach parents that it is never appropriate to forcibly hold their infant down for suctioning because the process of restraining the infant holds the potential to cause more harm than the good the suctioning would accomplish. Knox (2011) stated that trauma can occur if the child is allowed to struggle during the suctioning episode. During the study, one participant demonstrated how she holds her infant on his back on the floor between
her knees. This participant had creatively found a method of restraining her infant without forcibly holding or hurting him.

**Implications for Future Research**

**Strengthening the instrument.** The present study was a pilot study for the instrument developed by the principle investigator. As a result, in the course of completing the study some areas of the instrument were identified as needing improvement. In the demographics section, there is a select-all-that-apply item regarding the participants’ level of prior education. In the future, it would be clearer to simply ask the participants to report their highest degree completed, which would eliminate misreading and confusion. Several participants verbally reported while completing the pre-test that they had used another suction device instead of the bulb syringe. For greater specificity in the future, an item asking what suctioning device the first-time parent plans to use or uses currently needs to be added. One item addresses whether or not the participant has any previous medical training to identify possible sources for where he or she could have gained knowledge about suctioning. In this study, only one participant answered in the affirmative to this question, but in the future it would be useful to ask specifically what type of training the participant has, such as physical therapy, nursing, dentistry, etc. These modifications would serve to strengthen the demographics portion of the instrument.

A few of the items on the instrument need refining as well. Some of the terms in the indications for suctioning section, need clarification to be more easily understood by parents. “Difficulty breathing,” which meant retractions, grunting, and nasal flaring, should be enumerated in laymen terms as “the skin between the ribs pulling inward during breathing, noisy breathing, and nostrils flaring outward.” Parents may not have understood what was meant by “skin color change,” so the answer choice should read “a change to blue/gray skin tone.” No
participants selected this option on the pre-test and only 60% selected it following teaching. The option to suction when the infant was “sick” was too general, since the intended meaning was when the infant has “a runny nose and congestion.” In the section regarding cleaning of the bulb syringe, two items both contain the answer choices of “clean bulb after each use” and “clean bulb when visibly soiled.” These choices either need to be replaced with other options or removed completely.

**Refining the teaching script.** The script used by the principle investigator during the teaching intervention needs improvement to maximize the participants’ potential for learning. The teacher needs to emphasize that infants only breathe through their noses, so it is dangerous to occlude one nostril in order to suction the other. Children cannot blow their noses until 24 months, but the infant care books indicate that many infants will only tolerate suctioning until around 6 months (Ball & Bindler, 2008). These ages leave a gap where the infant would need to be restrained in some fashion for suctioning. Teaching should ensure that parents understand it is inappropriate to forcibly hold the infant down, since this practice could potentially cause harm.

On one of the cleaning items on the pre- and post-test, an answer option is wiping the outside of the bulb with alcohol. The instruction needs to be added to the teaching script that if alcohol is used for cleaning, the bulb should be thoroughly rinsed with water before using on the infant again. Isopropyl alcohol is irritating to oral and nasal mucosa and should only be used on surfaces that will not directly contact mucous membranes (WHO, 1990; Rutala, 1996).

In future presentations to first-time parents, the teacher should point out that babies could require suctioning at any time and stress the importance of having a bulb syringe near the infant in case of a choking event. The diaper bag is an especially important place to keep a bulb syringe since it would likely be near the infant even when traveling out of the home. Providing a variety
of suction devices on the market for examples and demonstration during the teaching 
intervention could improve the parents’ ability to relate to the information on suctioning. 
Discussing the proper use of each device could help parents more safely use whatever device 
they choose to suction their infant.

Future studies. To refine the instrument, focus groups of first-time parents need to be 
conducted to identify meanings of terms to this population, such as “difficulty breathing,” “sick,” 
or “skin color change.” This measure would help to ensure that the intended meaning was the 
same as what the participants read and understand. The focus group could also aid in refining 
what items need to be included on the instrument. The next step would be to repeat the study, 
using the improved instrument, with a larger sample size so that validity and reliability statistics 
could be determined.

Conclusions

Suctioning is performed for the purpose of clearing infants’ airways. If performed 
incorrectly it can potentially cause harm to the infant. The correct indications, methods, cleaning, 
and storage of the bulb syringe cannot be presumed to be self-evident. New parents need 
instruction in each of these categories. Further research is needed to determine best practice and 
to develop standardized guidelines on proper use to give to parents following the birth of a child. 
This pre- and post-test study with a teaching intervention provided validation that a short 
instructional session was useful in improving first-time parents’ knowledge of newborn 
suctioning.

Dissemination

The review of literature and study development of this honors research was presented at 
the Research and Creative Experience for Undergraduates (RCEU) poster presentation at the
University of Alabama in Huntsville in September, 2015. The complete findings were presented at the National Conference for Undergraduate Research (NCUR) in Asheville, North Carolina, in April 2015 and Research Horizons Day at The University of Alabama in Huntsville, April 2015. The findings will be published in the NCUR conference proceedings.
References


Hanson, L.A. (2016). Efficacy of Triclosan and Povidone-Iodine as disinfectants against *Escherichia coli* isolated from neonatal oronasopharyngeal suctioning devices [Powerpoint slides].


O’Neal, P., Adams, E., Norris, C., Ayers, A., Harbin, B., Breland, M., Hanson, L., Stillwell, R., 
& Richardson, F. (2016). The evolution of suctioning practices. Manuscript in 
preparation. The CLEAR Project, College of Nursing, The University of Alabama in 
Huntsville.

Perlman, J., Wyllie, J., Kattwinkel, J., Atkins, D., Chameides, L., Goldsmith, J., . . . Velaphi, S. 
resuscitation and emergency cardiovascular care science with treatment 
recommendations. Circulation, 122(2), S516-S538. 
doi:10.1161/CIRCULATIONAHA.110.971127

Influence on cerebral and peripheral tissue oxygenation. Early Human Development, 91, 


Tactics for teaching evidence-based practice: 'Moo'ving to greener pastures. Worldviews 
On Evidence-Based Nursing, 12(1), 64-66. doi:10.1111/wvn.12073


Oropharyngeal and nasopharyngeal suctioning of meconium-stained neonates before


Appendix A – Consent Form
Consent Form: First-time Parents’ Knowledge of Newborn Suctioning

You are invited to participate in a research study about first-time parents’ knowledge of newborn suctioning. This study is designed to help us to better understand what new parents know related to newborn suctioning with a blue bulb syringe.

The primary investigator is Megan Breland, an Honor Nursing Student, from the University of Alabama in Huntsville, College of Nursing. Faculty Advisor is Ellise D. Adams PhD, CNM. The investigators are in no way affiliated with the recruitment site, A Nurturing Moment, and have no association with any potential participants.

PROCEDURE TO BE FOLLOWED IN THE STUDY: Once written consent is given, you will be asked to complete a written pre-test containing a demographics section and a knowledge of bulb suctioning section. The primary investigator will then present a 15-minute lecture and demonstration on proper indications and method for using bulb suctioning. At the end of the class, you will be given a flyer asking you to complete an electronic post-test of knowledge of bulb suctioning. This study participation time will take 60 minutes maximum.

DISCOMFORTS AND RISKS FROM PARTICIPATING IN THIS STUDY: There is a risk for loss of confidentiality, but measures will be taken to minimize this risk.

EXPECTED BENEFITS: Potential benefits from participating in the study are that the participant will gain knowledge of the proper indications and methods for using the blue bulb syringe and of proper cleaning and storage of the blue bulb syringe. The participant’s confidence related to parenting may increase.

CONFIDENTIALITY OF RESULTS: The number on your pre-test corresponds to the number on the flyer reminding you to complete the post-test, and these numbers will be made available only to those researchers directly involved with this study, thereby ensuring strict confidentiality. This consent form will be destroyed after 3 years. The data from your session will only be released to those individuals who are directly involved in the research and only using your participant number. The consent form will be stored in a secure location accessible only by the
faculty advisor. The pre- and post-tests will be separated from the consent forms, so no data will be associated with any names of participants.

FREEDOM TO WITHDRAW: You are free to withdraw from the study at any time. You will not be penalized because of withdrawal in any form. Investigators reserve the right to remove any participant from the session without regard to the participant’s consent. Your participation in this research is completely voluntary. Your decision to participate or not participate in the study will have no effect on your relationship with or services received from A Nurturing Moment.

CONTACT INFORMATION: If you have any questions about the study, please ask them now. If you have questions later on, you may contact the Principal Investigator, Megan Breland, at 256-609-8991 or at meb0019@uah.edu or Ellise Adams at 256-824-2442 or ellise.adams@uah.edu. If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact the Office of the IRB (IRB) at 256.824.6101 or email Dr. Pam O’Neal at irb.@uah.edu.

If you agree to participate in our research, please sign and date below. If you are under the age of 18, please provide your parent or legal guardian’s signature indicating consent.

This study was approved by the Institutional Review Board at UAH and will expire in one year from October 23, 2015

_______________________________  ______________________________
Name (Please Print)                  Signature                  Date

_______________________________
Parent/Guardian Signature (if younger than 18)
Appendix B – Pre-test

FIRST-TIME PARENTS’ KNOWLEDGE OF NEWBORN SUCTIONING PRE-TEST

Megan Breland, Honors Student and Ellise Adams PhD, CNM
All Rights Reserved
Contact author for permission to use

The First-Time Parents’ Knowledge of Newborn Suctioning Pre-test (FTPKNS-pre) was designed to be paper and pencil instrument to measure the concept: knowledge of parents (caregivers) related to airway clearance of the newborn. The FPKNS-pre consists of 12 quantitative items. Determining the knowledge of new parents can assist administrators, educators and researchers to identify education needs related to airway clearance of the newborn.

*The authors would like to acknowledge the assistance of CLEAR Project team members: Pamela O’Neal PhD, RN, Casey Norris MSN, CNS, Angela Ayers RN, Linda Hanson, Rebecca Stillwell
Section 1:

Demographics

My age is: ______________

My gender is: ___________ Female ___________ Male

My race is: ______ White/Caucasian _____ Black/African American _____ Hispanic/Latino
____ American Indian/Alaskan Native ____ Pacific Islander ____ Two or more races
____ Other

My infant is due in ____ weeks OR My infant is _____ months ______ weeks old

This is my first infant
_____ yes _____ no

Education

Select all that apply. I have completed the following degrees:
____ GED or High School
____ Some College
____ Associate or Bachelor’s Degree
____ Master’s Degree
____ Doctoral or higher

Do you have training in the healthcare field? (Examples include doctor, nurse, nursing assistant, paramedic, dental assistant, occupational therapy, etc.)
_____ yes _____ no

Have you ever attended a childbirth, parenting, or breastfeeding class before this course?
_____ yes _____ no

If yes, which one(s)?
_______ Childbirth
_______ Parenting
_______ Breastfeeding
NEW PARENTS’ KNOWLEDGE OF NEWBORN SUCTIONING PRE-TEST

Section 2:

Review the following statements related to newborn suctioning. Think about your individual practice. Choose the answer(s) that most closely reflect your knowledge of newborn suctioning.

Indications

1. I will use the blue bulb syringe to suction my infant’s mouth and nose when (select all that apply):
   a. The infant is choking
   b. I see secretions in the infant’s mouth or nose
   c. I hear the infant gurgling or gagging
   d. The infant’s breathing is slowed
   e. The infant’s breathing is fast
   f. The infant is having difficulty breathing
   g. The infant’s skin color has changed
   h. Every day
   i. The infant is sick
   j. Other ________________________________

2. I plan to use the bulb syringe until my infant (select all that apply):
   a. Is 3 months old
   b. Is 6 months old
   c. Is 9 months old
   d. Is 1 year old
   e. Can blow his/her nose
   f. Will no longer tolerate it

3. How often will you use the bulb syringe?
   a. Every day
   b. Every other day
   c. Weekly
   d. Monthly
   e. Every time the infant is sick
   f. Only when the infant is having difficulty breathing due to nasal congestion

Methods

4. Will you suction the infant’s mouth or nose first?
   a. Mouth
   b. Nose
   c. It doesn’t matter
5. The method I will use to suction my infant includes (select all that apply):
   a. Squeeze the air out of the bulb syringe before inserting it into the infant’s mouth or nose
   b. Close one nostril to suction the other nostril
   c. Slowly release the syringe to draw secretions into the bulb
   d. Insert the bulb 1 inch into either side of the mouth
   e. Suction the back of the throat
   f. Insert the bulb ¼ inch into the nostrils

6. When I am preparing to suction my infant, I will position him/her (select all that apply):
   a. On his/her back on my lap
   b. Head slightly below body
   c. On his/her side
   d. Sitting-up or vertical

Cleaning

7. What signs will you use to tell when the bulb syringe needs to be cleaned (select all that apply)?
   a. I have just used it to suction the infant’s mouth and/or nose
   b. The infant has been sick and is now well
   c. The bulb is visibly soiled
   d. The bulb was dropped on the floor
   e. The bulb has been in the bottom of the diaper bag
   f. The bulb has been put away and I have not used it in awhile

8. The process that I will use for cleaning the bulb syringe includes (select all that apply):
   a. Squeeze the bulb and discharge contents until they are no longer present
   b. Clean the bulb after each use
   c. Clean the bulb when visibly soiled
   d. Use clean water to clean the bulb
   e. Use soap and water to clean the bulb
   f. Wipe the outside of the bulb with alcohol
   g. I do not clean the bulb
   h. Other, describe

______________________________________________________________
9. How often will you clean the bulb syringe?
   a. After each use
   b. Daily
   c. Weekly
   d. Monthly
   e. Less than monthly
   f. I don’t plan to clean the bulb syringe

Storage

10. How long do you think you will keep the bulb syringe prior to discarding it?
   a. 1 week
   b. 1 month
   c. 3 months
   d. 6 months
   e. 1 year or more

11. How many bulb syringes do you plan to have?
   a. 1, the one provided by the hospital
   b. 2
   c. 3
   d. 4
   e. 5 or more

12. In which of the following locations do you plan to store a bulb syringe (select all that apply)? If you only plan to have one bulb syringe, select the one place you plan to store it.
   a. Beside the infant’s bed/crib
   b. In the diaper bag
   c. In the bathroom/medicine cabinet
   d. In the kitchen
   e. Other ________________________________

Contact information:
Megan Breland, Honors Student
meb0019@uah.edu
256-609-8991

Ellise Adams PhD, CNM
CLEAR@uah.edu
256-824-2442
Appendix C – Teaching Outline

First-Time Parents’ Knowledge of Newborn Suctioning Teaching Outline

- **Indications for suctioning**
  - Learning objective: Participant will be able to list three proper indications for suctioning.
    - Infant is choking
    - I hear the infant gurgling or gagging
    - The infant’s breathing is slowed
    - The infant’s breathing is fast
    - The infant is having difficulty breathing
    - The infant’s skin color has changed (pale, blue, dusky)
    - The skin between the infant’s ribs draws in when he or she takes a breath
    - Just because “boogers” are in the infant’s nose does not mean he needs suctioning
    - The infant does not need suctioning every day, only when he or she is sick. Even this wiping the nose and using gravity to help drain may work just as well.
    - Most babies only tolerate suctioning for about 6 months

- **Method for suctioning**
  - Learning objective: Participant will be able to select a description of the proper method for suctioning.
    - Always suction the mouth first, then the nose
    - Always squeeze the air out of the bulb before inserting it into the infant’s mouth or nose
      - Squeezing the bulb once it is already in the infant’s mouth or nose will drive the secretions farther back and could push them up into the ears, causing an infection
    - Insert the tip of the bulb syringe into the side of the infant’s mouth and slowly release the compressed bulb to draw the secretions into the bulb
    - Remove the bulb and depress contents into a tissue by repeatedly squeezing the bulb
    - Repeat in the other side of the mouth. Never insert the bulb directly to the back of the infant’s mouth. This could cause the infant’s heart rate to suddenly drop or the infant could gag and choke
    - If the infant’s nose needs suctioning, compress the bulb then insert the tip no more than ¼ inch into one nostril. Do not close the other nostril while suctioning. Slowly release the bulb to draw out secretions. Repeat on the other nostril, if necessary

- **Cleaning of suctioning device**
  - Learning objective: Participant will be able to identify the proper procedure for cleaning the bulb syringe.
- The bulb syringe should be cleaned following every use
- Compress the bulb in warm, soapy water and release to draw soapy water into the bulb
- Rinse the outside of the bulb. Draw clean water into the bulb and depress to rinse. Repeat until water is clear.
- Wash thoroughly before storage following an illness or discard and replace

**Storage of suctioning device**
- Learning objective: Participant will be able to list three locations in which the bulb syringe should be stored.
  - The bulb syringe should be stored in close proximity to the infant
  - Possible storage locations could include in the infant’s room, in the diaper bag, in the medicine cabinet or bathroom, or in the kitchen
  - It is up to the parent how many bulb syringes to have on hand
  - The bulb syringes should be replaced periodically, especially following any major or prolonged illness, contamination (mud); No official recommendation
Appendix D - Post Test Flyer

Please complete the Post-test!

Go to:
https://uah.co1.qualtrics.com/SE/?SID=SV_4lpHw98rUot4qvX

Thank you for your participation!
Your response is vital to the completion of this study!

If you have questions, please contact
Megan Breland, UAH Nursing Honor Student
meb0019@uah.edu

Ellise Adams PhD, CNM
ellise.adams@uah.edu
The First-Time Parents’ Knowledge of Newborn Suctioning Post-test (FTPKNS-post) was designed to be paper and pencil instrument to measure the concept: knowledge of parents (caregivers) related to airway clearance of the newborn. The FPKNS-post consists of 12 quantitative items. Determining the knowledge of new parents can assist administrators, educators and researchers to identify education needs related to airway clearance of the newborn.

*The author’s would like to acknowledge the assistance of CLEAR Project team members: Pamela O’Neal PhD, RN, Casey Norris MSN, CNS, Angela Ayers RN, Linda Hanson, Rebecca Stillwell
NEW PARENTS’ KNOWLEDGE OF NEWBORN SUCTIONING POST-TEST

Review the following statements related to newborn suctioning. Think about your individual practice. Choose the answer(s) that most closely reflect your knowledge of newborn suctioning.

Indications

1. I will use the blue bulb syringe to suction my infant’s mouth and nose when (select all that apply):
   a. The infant is choking
   b. I see secretions in the infant’s mouth or nose
   c. I hear the infant gurgling or gagging
   d. The infant’s breathing is slowed
   e. The infant’s breathing is fast
   f. The infant is having difficulty breathing
   g. The infant’s skin color has changed
   h. Every day
   i. The infant is sick
   j. Other _________________________________

2. I plan to use the bulb syringe until my infant (select all that apply):
   a. Is 3 months old
   b. Is 6 months old
   c. Is 9 months old
   d. Is 1 year old
   e. Can blow his/her nose
   f. Will no longer tolerate it

3. How often will you use the bulb syringe?
   a. Every day
   b. Every other day
   c. Weekly
   d. Monthly
   e. Every time the infant is sick
   f. Only when the infant is having difficulty breathing due to nasal congestion

Methods

4. Will you suction the infant’s mouth or nose first?
   a. Mouth
   b. Nose
   c. It doesn’t matter
5. The method I will use to suction my infant includes (select all that apply):
   a. Squeeze the air out of the bulb syringe before inserting it into the infant’s mouth or nose
   b. Close one nostril to suction the other nostril
   c. Slowly release the syringe to draw secretions into the bulb
   d. Insert the bulb 1 inch into either side of the mouth
   e. Suction the back of the throat
   f. Insert the bulb ¼ inch into the nostrils

6. When I am preparing to suction my infant, I will position him/her (select all that apply):
   a. On his/her back on my lap
   b. Head slightly below body
   c. On his/her side
   d. Sitting-up or vertical

Cleaning

7. What signs will you use to tell when the bulb syringe needs to be cleaned? (select all that apply)
   a. I have just used it to suction the infant’s mouth and/or nose
   b. The infant has been sick and is now well
   c. The bulb is visibly soiled
   d. The bulb was dropped on the floor
   e. The bulb has been in the bottom of the diaper bag
   f. The bulb has been put away and I have not used it in awhile

8. The process that I will use for cleaning the bulb syringe includes (select all that apply):
   a. Squeeze the bulb and discharge contents until they are no longer present
   b. Clean the bulb after each use
   c. Clean the bulb when visibly soiled
   d. Use clean water to clean the bulb
   e. Use soap and water to clean the bulb
   f. Wipe the outside of the bulb with alcohol
   g. I do not clean the bulb
   h. Other, describe

_________________________________________________________
9. How often will you clean the bulb syringe?
   a. After each use
   b. Daily
   c. Weekly
   d. Monthly
   e. Less than monthly
   f. I don’t plan to clean the bulb syringe

**Storage**

10. How long do you think you will keep the bulb syringe prior to discarding it?
    a. 1 week
    b. 1 month
    c. 3 months
    d. 6 months
    e. 1 year or more

11. How many bulb syringes do you plan to have?
    a. 1, the one provided by the hospital
    b. 2
    c. 3
    d. 4
    e. 5 or more

12. In which of the following locations do you plan to store a bulb syringe (select all that apply)? If you only plan to have one bulb syringe, select the one place you plan to store it.
    a. Beside the infant’s bed/crib
    b. In the diaper bag
    c. In the bathroom/medicine cabinet
    d. In the kitchen
    e. Other ____________________________

Contact information:
Megan Breland, Honors Student
meb0019@uah.edu
256-609-8991

Ellise Adams PhD, CNM
CLEAR@uah.edu
256-824-2442
October 23, 2015

Ms. Megan Brelan and Dr. Dr. Ellise Adams  
College of Nursing  
University of Alabama in Huntsville  

Dear Ms. Brelan and Dr. Adams,

The UAH Institutional Review Board of Human Subjects Committee has reviewed your proposal First-time Parents’ Knowledge of Newborn Suctioning, and found it meets the necessary criteria for continued approval. Your proposal seems to be in compliance with this institution’s Federal Wide Assurance (FWA) 00019998 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Please note that this approval is good for one year from the date on this letter. If data collection continues past this period, you are responsible for processing a renewal application a minimum of 60 days prior to the expiration date.

No changes are to be made to the approved protocol without prior review and approval from the UAH IRB. All changes (e.g. a change in procedure, number of subjects, personnel, study locations, new recruitment materials, study instruments, etc) must be prospectively reviewed and approved by the IRB before they are implemented. You should report any unanticipated problems involving risks to the participants or others to the IRB Chair.

If you have any questions regarding the IRB’s decision, please contact me.

Sincerely,

David Berkowitz, PhD  
IRB Chair  
Dean Graduate Studies

OFFICE OF THE VICE PRESIDENT FOR RESEARCH  
Von Braun Research Hall M-17  
Huntsville, AL 35899  
T 256.824.6100  
F 256.824.6783
Figure 1

Pre- to Post-test Response Changes

- Use soap and water to clean
- Use water to clean
- Clean after being in diaper bag
- Clean after dropped on floor
- Clean when visibly soiled
- Clean on recovery from illness
- Baby on back
- Back of throat
- Close one nostril to suction other
- Mouth before nose
- Until not tolerated
- Color change
- Difficulty breathing
- Slow breathing
- Choking

Post-Test | Pre-Test
---|---
0% | 20% | 40% | 60% | 80% | 100%