2013

Standardized Care of the Late Preterm Infant in Upper Midwest Hospitals

MIchelle Susanne Foy
Minnesota State University - Mankato

Barriers to Standardized Care of Late Preterm Infants in Upper Midwest Hospitals

By

MICHELLE SUSANNE FOY

A THESIS SUBMITTED IN

PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE

MASTER OF SCIENCE

IN

NURSING

MINNESOTA STATE UNIVERSITY

MANKATO, MINNESOTA

JULY, 2013

Date: July 15, 2013

This thesis page been examined and approved.

Examining Committee:

Donna Brauer, PhD, RN

Sandra Eggenberger, PhD, RN

Abstract

Barriers to Standardized Care of Late Preterm Infants in Upper Midwest Hospitals

Foy, Michelle, MS. Minnesota State University, Mankato, 2013.

Standardizing care or critical pathways have delivered evidence-based care in adult medicine and have positive patient outcomes. Some aspects of standardized care have been used in neonatology, but less often in caring for the late preterm infant (gestational week 34-37 weeks). With each level of care nursery, Level-I, level-II or level-III, there can be a wide range of how to care for the late preterm infant. The purpose of this study was to determine if nurseries or various levels of care had established standards of care specific to the late preterm infant and what barriers existed that prohibited standards of care. A 10-questions survey was sent out to nurse leaders in Mid-western states and a follow-up interview of self-report responses was conducted on a random selection of the participants. Data revealed that standardized care for late preterm infants, including where the LPI gets admitted, use and discontinuation of thermoregulation, feedings, car seat testing and follow-up occurs more often in level-III nurseries and less often in level-I nurseries. Finding suggest that barriers to standardizing care for late preterm infants is often because of physician preferences, nursing staff attitude and experience level and facility constraints.

Table of Contents

Page

Chapter

Chapter I

I. Introduction to the Problem:

1.1 Background

The field of neonatology has grown in the past two decades; advanced technology, improved health outcomes, "saving" babies as young as 22 weeks gestation. Despite all of these developments, the near preterm baby, often called the *late preterm infant,* has been increasing in numbers. According to researchers at Loyola University Medical Center in Illinois, there had been an increasing number of preterm births in the past 15 years for a variety of reasons (Engle et al., 2007). The late preterm infant makes up 70% of all preterm births (McLaurin K. et al., 2009).

The late pre-term infant (LPI) is often close to the size of full term infants and is treated by parents, caregivers and health care workers as developmentally and a low risk morbidity the same as full term infants. They are at higher risk for developing complications and despite the higher rates of morbidity and mortality the late pre-term infants are usually managed in newborn level-1 nurseries or remain with their mother after birth (Stark, 2005). Compared with term infants, LPI have higher frequencies of respiratory distress, temperature instability, hypoglycemia, kernicterus, apnea, seizures, and feeding problems, as well as higher rates of re-hospitalization (Raju T., 2008)

Late preterm infants have a unique set of challenges due to being born several weeks early. When the gestational age of a baby is known, an assessment is done on the baby and a decision is made as to where it will be admitted. Level-1 nurseries have the least amount of nursing care and support. Often there is no nursery and the baby stays with its mother and is in the care of its mother the majority of the time with occasional nurse assessments and teaching. A

level-II nursery is for the stable preterm and full term infants and has a 1:3 patient ratio and is cared for completely by nurses with occasional visits and cares from the parents. There is intravenous therapy, respiratory support and treatment, and infant medication administration. Level-III nurseries are the highest level of nursing care and have a 1:1, 1:2, or 1:3 patient to nurse ratio. A level-III can care for micro preemies and the most acute full term infants through a variety of modalities such as critical care respiratory support, critical medication administration, and surgical procedures.

Some hospitals keep the LPI with its mother on the post partum floor which is cared for by a maternal-newborn nurse and some transfer the baby to the level-II or level-III nursery which is cared for by a neonatal team. Each type of nursery has a different approach in caring for the late preterm as well as differing lengths of stay. The care a late preterm baby receives can be minimal such as in a nursery and coupled with its mother or it can receive care in a neonatal intensive care unit.

One of the last things to mature in a developing fetus that is prevalent in many late preterm infants is the developing skill of safe and efficient feeding. This skill is one of the most challenging milestones for all infants. Infants develop at different rates and ages. A late preterm infant needs to transition from a feedings tube to independently sucking, swallowing and breathing during feedings, all the whole taking enough volume to gain weight each day without tiring out. The immature feeding patterns and ability of many late preterm infants put them at risk for taking inadequate volume, have poor growth, develop dehydrations and have complications of hyperbilirubenia. Poor feedings can prevent a timely discharge with its mother or can develop after a couple days after discharge and lead to poor outcomes and morbidity.

The average length of hospital stay for a term infant is 2.2 days costing an average of $2,061. Comparatively, the average hospital stay for a late-preterm infant is 8.8 days and the average cost is $26,054. (McLaurin, et al. 2011) There is a differing amount of post discharge care that can affect outcome of weight gain and feeding success for the baby as well as risk for re-admission. In the same study, there is also a higher re-admission rate for the late preterm infant- 15.2% vs.7.9%for the full term infant (McLaurin, et al. 2011).

There has been a call by the IOM for more standardized care for the late preterm infants. Standardizing care is a management plan with goals for patients and a sequence of interventions that are necessary to achieve the goals. Critical pathways is another term for standardized care and has been embraced by some areas of medicine, such as cardiovascular medicine to help contain the high cost of cardiovascular care. Decreasing costs and improving quality of care are the overall goals. The concerns of standardizing care or following a critical pathway are the variations in patients. The individual variations cannot or should not always be controlled.

There is limited research on the standardization of care of the late preterm infant (34-37 week gestation) in various health care settings. There is a lack of a standardized care using pathways that a late preterm infant. A clinical pathway, or standardized care for the late preterm infant may promote the best outcomes, decrease length of stay and decrease re-admissions. Health care providers, the baby and the parents would all benefit from having an evidence-based pathway of care for the hospitalized late preterm infant. For the remainder of the paper, the terms standardized care and critical pathways will be used interchangeably.

II. Problem Statement:

The lack of clinical pathways or standardized care for the late preterm infants affects the infants and their parents because of the increased morbidity and possible poor outcomes from unstandardized care. It can also affect medical insurance companies because of the longer length of stay and re-admissions. The lack of a pathway can have an effect on the preterm infant because care could be missed and the infant may not receive best care for the best outcome. The literature shows clinical pathways for the full term infants so they are not affected and do not have the same outcomes. A lack of clinical pathways for LPI is a problem when health care providers treat the LPI as a full term infant with a usual full term discharge plan and little to no plan for nutrition support, parent education or a immediate follow up plan. A recent study from Loyola University Medical Center, IL says that late pre-term babies who are treated as full term babies have a twice as high emergency room visit in the first month of life than full term babies (Q. Agency, 2011). This can be a problem in any hospital that delivers late preterm infants; in a newborn nursery, level-II, level-III or a birth center. All delivering facilities should know the risks associated with late preterm infants and what is the evidence-based best care for the late preterm infant and it's family.

III. Purpose of the Study:

This study determined if hospitals have a standard of care for the LPI born at 34-37 weeks gestation and the barriers that may exist in creating standards for care. Literature revealed that having a standard of care is best care for the late pre-term infants and it will produce optimal outcomes. Best outcomes for the late pre-term infant result in healthier babies, less resources used, better prepared parents and few re-admissions.

IV. Research Objectives, Research Questions, and/or Hypothesis:

1.1 The objectives of this research is to determine if urban and rural hospitals of varying size and level of nursery care had barriers for a standardized plan for caring for the late preterm infants.

1.2 Questions to consider from this research are:

a. Do level one newborn nurseries care for their late preterm infants or do they transfer the infant to a level-II or level-III nursery?

b. Do the level-I, II or level-III nurseries have a clinical pathway or standardized care for the late preterm infant?

c. Do late preterm infants that have a standardized feedings plan and nutrition support while hospitalized have improved growth and development?

d. Do all late preterm infants go through car seat testing prior to discharge?

e. Does nursing parents receive additional education on caring for the late pre-term infant? Is there opportunity for parent to board in with their infant prior to discharge?

1.3 Hypothesis:

The majority of hospitals in the sample study have barriers to standardizing care of the late pre-term infant during hospitalization and thus the infants are not achieving the best outcomes.

V. Definition of Terms:

The American Academy of Pediatrics and the American College of Obstetricians and Gynecologists define "'**preterm infant** as one who is born before the end of the 37th week (259th day) of pregnancy, counting from the first day of the last menstrual period. There are many terms other than the late pre-term to describe this subset of preterm infants. "Near term," "marginally preterm," "moderately preterm," "minimally preterm," and "mildly preterm" have been used to describe this period of gestation prior to term infants This study will define the **late preterm infant** as any infant born at 34 0/7 weeks to 36 6/7 weeks gestation (Raju T., 2008).

There have been designated levels of nursery care since 1976. All hospitals which deliver babies have a minimum of a **level-I nursery** which is basic neonatal care coupled with maternity care. There is a minimum requirement of nursing care Personal are trained in neonatal resuscitation and will stabilize infants and transfer them out. All babies staying in a level-I nursery must be stable and healthy. A **level-II nursery** has basic neonatal care also specialty care for moderately ill infants who are expected to recover quickly. A level-II nursery is for the stable preterm and full term infants and has a 1:3 patient ratio and is cared for completely by nurses with occasional visits and cares from the parents. There is intravenous therapy, respiratory support and treatment, and infant medication administration. Short-term ventilation and continuous positive airway pressure is found in many level-II nurseries. There must be equipment and personnel available to address emergencies in these nurseries. **A level-III nursery** is neonatal care for the extreme premature, critically ill or infants who require surgery. Various types of ventilation, critical medicines and drips, dialysis and often surgical procedures are some types of care an infant in a level-III nursery can receive.

Research outcomes are defined as the desired end result of having standardized care for the late preterm infant in hospitals. These outcomes include optimal weight gain 10 days after discharge and a decrease in re-admission rate.

Standardized care for nurseries caring for the LPI includes: nutrition support, thermal regulation, use of kangaroo care, car seat testing, pre- and post- breastfeeding weights, education for staff and parents, follow-p with primary care physician and lactation support.

Summary:

The pre-term birth rate has been increasing by 31% over the past two decades (Adamkin, 2006) which has led to questioning if standardized care of the late preterm infant would lead to improved outcomes. Many of these babies have early discharges with their mothers, which set them up for an increase in morbidity and re-admissions for additional medical care. It is important that hospitals have standardized care for the LPI so that there can be optimal outcome after the initial hospital discharge. Outcomes that could be studies should be the hospital re-admission rate and weigh trends of a LPI who was care for in a standardized way.

Chapter II

REVIEW OF THE LITERATURE

Prematurity is a major cause of neonatal mortality and morbidity, even in 2011. There has been a 31% increase in preterm births in the United States in the past twenty years (Adamkin, 2006). The biggest segment of premature infants in the late preterm infant (LPI), which is 34 0/7 and 36 6/7 weeks gestation.

Description of Literature Methods Used

A careful review of the literature has resulted in the research findings in the area of a pathway of clinical care for the LPI. An electronic database search was performed to indentify the literature: Specifically, MEDLINE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and the Cochrane Library were searched for journal articles written and published between 1990 and December 2010. The keywords used in the searches were late preterm infant, prematurity and term infants and was cross-referenced with, NICU (neonatal intensive care unit), Kangaroo Care, nursery, standardized care and pathways. Three hundred to six hundred articles were found when searching for adult articles related to clinical pathways or standardized care, but only six to twenty-five articles were found in the area of a neonatology clinical pathway and less written on a clinical pathway for the late preterm infant.

Themes of a Neonatal Clinical Pathway for the Late Preterm Infant

A committee made up of Association of Women's Health, Obstetric, and Neonatal Nurses - Professional Association has developed guidelines for acute care of the late preterm infant. There are several aspects in the guidelines related to initial care, transitional care and discharge:

- gestational assessment

- feeding challenges
- thermoregulation issues
- hypoglycemia
- respiratory assessment
- sepsis
- jaundice and hyperbilirubenia
- parent teaching and support (www.guidelines.gov)

Implementing best practice and evidence-based guidelines can be done through clinical pathways.

There are many themes in neonatology that have been partially standardized or could benefit from standardization of care of the late preterm infant. This paper will review four themes for the purpose of developing a future clinical pathway for the LPI in comparison to adult clinical pathways.

I. Nutrition

Adequate nutrition can be a challenge to the late pre-term infant. There is a lot of literature on managing nutrition of the very low birth weight infant, but little is researched on the nutritional management of the LPI. There is substantial nutritional risk for the LPI because they are often viewed as newborns and treated in the maternal-newborn nursery. A recent study previously published Moderately Premature Infant Project found variations in nutritional practices that influenced weight gains. All of the babies in the study were admitted to a neonatal intensive care unit (NICU). The range of infants who received total parental nutrition was 5%-66%. There was also a large range of infants 4%-72% discharged with advice from the health practitioners to be fed with a high calorie formula (McCormick M. et al., 2006). One recent

study states that 27% of all late preterm infants required intravenous therapy compared to only 5% of all term infants (Wang et. al, 2004).

The late preterm infant has been called the "great pretender" because they masquerade the term infant on the basis of chubby appearance and behaviors. This masquerading puts the baby at risk for breastfeeding failure; dehydration and feeding problems that can delay discharge and extend post discharge. Immature infants are less able to be effective at sucking and swallowing, especially with breastfeeding (Meier P., 2010).

There is an increased risk from lactation in the preterm and late preterm infant. Benefits of breastfeeding and exclusive breast milk are well documented but there are some poor outcomes poor preterm infants who breast-feed. The morbidities directly related to lactation are poor growth, jaundice, and dehydration. Breast-feeding can exacerbate the preterm to develop temperature instability, hypoglycemia, respiratory distress, jaundice, feeding problems and re-hospitalization within the first two weeks post birth (Meier P., 2007). Delayed lactogenesis and the effectiveness of milk removal from the breast by the late preterm infant contribute to the risks associated with breastfeeding. Because of this, the clinician who cares for the LPI should not assume that breastfeeding will proceed effectively, but should approach lactation with caution and intervention, both during the hospital stay and have a discharge plan for the mother and baby.

Some nurseries allow LPI to initiate breastfeeding if they are showing cues during a kangaroo care session. Other nurseries hold off any breastfeeding, despite baby's cues until they reach 36 weeks gestational age. Some level 3 nurseries utilize "*feeding readiness scales"* which objectively give a score to the baby on his or her readiness cues and they initiate oral feedings based on those scores. The feeding readiness scales are an infant-driven feeding score based on

infant behaviors observed by the nurse or parent to determine if oral feedings will be attempted. Feeding readiness scores in an objective way for nursing staff to determine if LPI babies would be ready to try oral feeding. "Feeding readiness is often evaluated by an infant's display of non-nutritive sucking and oromotor patterning," (Lau, 2006). *Appendix 1.* There is a "*feeding quality scale"* used to determine the quality of the infant's ability to suck and swallow the feeding and sustain the oral feeding. *Appendix 2.* Feeding readiness and quality feeding scales are considered a part of a clinical pathway for late preterm infants. The earlier research on feeding readiness (Kirk, 2007) found some late preterm infants have feeding readiness as early as 32 weeks and by using a standardized feeding pathway, babies can be at full feedings six days earlier than not using standardized pathways.

Supplementing breastfeeding is often necessary for the preterm infant because of delayed lactogenesis, inadequate milk supply, jaundice, hypoglycemia, and the weakened and immature sucking quality of the late preterm. One study conducted showed evidence that the LPI had a poor ability to "extract milk from the breast even when it is available. Even with milk available, only 30% of daily intake from the breast during the first week at home, and gradually increased to 52% of daily intake during breastfeeding over week 4" (Meier P., 2007). To ensure the infant is adequately fed, a supplement of expressed breast milk, or formula given in a bottle or a supplementary milk delivery system.

Slow flow nipples are used in many nurseries for all breast fed babies who are taking a bottle and often with all late preterm infants. This type of nipple slows the flow of milk out if it so the infant can coordinate the milk bolus and reduce the risk for aspiration. The slow flow nipple has been increasing in popularity as a standard practice for all breastfeeding late preterm infants (McCair, 2003).

Nipple shields are used to facilitate milk transfer for the LPI both in the hospital and after discharge. The nipple shield compensates for the weak suction and allows for the preterm infant to latch on the nipple and prevents "slipping off," or falling asleep after a few minutes of sucking (Meier, 1994). Supplementation of breastfeeding and the effectiveness of milk transfer can be assessed by test weights, both pre- and post-breastfeeding.

Test weights, using a commercial BabyWeigh (Medula, Inc., McHeanry,IL) scale can be performed in the hospital and just as importantly, after discharge at home by the mother, to detect inadequate infant intake and weight gain for the late preterm infant (Meier et al., 1996, 1994). Pre and post weights are an objective way to determine of the LPI baby has taken enough volume at breast to be sufficient for growth and can guide the clinician or mother on how much to supplement to ensure adequate caloric intake. It also eliminates the need for the family to go to the pediatrician or lactation specialist's office for a costly "weight check."

I. Thermal Regulation

Thermal regulation of the LPI could benefit from standardization in neonatal care. Preterm infants become cold stressed during and after birth, and the separation of the mother and infant after the birth, a common practice in the Western culture, can contribute to hypothermia in the infant. All preterm infants, including the late preterm, is at risk for hypothermia because of their immature skin, the high ratio of surface area to birth weight, less brown fat in the preterm infant's body, environmental conditions of the delivery room. Approximately 50% of newborns experience some degree of cold stress after birth. (Viral D., 2010). Keeping a preterm warm and dry initially after birth and warm during the transition period is important since hypothermia can cause hypoglycemia, respiratory distress, metabolic acidosis, energy expenditure and signs of sepsis (Viral D., 2010).

Thermoregulation is used in neonatal care when babies have a difficult time maintaining their temperatures 97.6 degrees Fahrenheit. Late preterm infants are particularly susceptible to unstable temperature regulation because of their smaller size and lesser amount of brown fat than a full term infant. Brown fat is in abundance in full term infants and is responsible for generating heat production in a newborn's body. A LPI has a lesser amount, which can cause heat loss and thus a LPI may need to utilize thermoregulation. Radiant heat by use of an infant warmer or an enclosed isolette with servo control or air control temperature regulation is the primary ways thermoregulation is delivered to infants. A newly born LPI may spend less than one day or weeks in thermoregulation. Developmental maturity, size of infant, septic status and environmental factors such as temperature of the room can all affect how long a LPI will require thermoregulation. The goal of thermoregulation is to help the infant maintain a core body temperature of 97.8-99.2 degrees Fahrenheit and wean down the external heat source so the baby can maintain it's own temperature in just linens.

Skin-to-skin contact or "kangaroo care," begins at birth and involves placing the naked baby, covered across the back with a warm blanket, prone on the mother's bare chest (Moore, 2008). A study on kangaroo care determined the stability of a premature infant's vital signs during kangaroo care. Results showed a "mean cardio-respiratory and temperature outcomes remained within clinically acceptable ranges during kangaroo care. Apnea, bradycardia, and periodic breathing were absent during kangaroo care. Regular breathing increased for infants receiving kangaroo care compared to infants receiving standard NICU care (Ludington-Hoe et.al, 2004). The mother of the preterm and LPI are encouraged to regularly participate in kangaroo care for hours at a time, to provide the many benefits including temperature stability.

External heat sources, such as the warmer and isolette are used in level-II and level-III nurseries and the warmer is used in the newborn nursery to provide. Some babies, especially preterm babies, rely on external heat sources to maintain body and skin temperatures especially in the first 12-24 hours. Babies who are very small, ill or have temperature instability require external heat sources longer than 24 hours post-delivery. Isolettes and radiant warmers are used in nurseries to provide heat to the preterm baby and special plastic wraps or bags, plastic caps, heated mattresses are equipment used in the delivery room, along with drying the baby, applying a hat and warm blankets and initiating skin-to-skin with the mother are used in the delivery room. A study showed these interventions were effective in preventing hypothermia in the preterm infants according to the weeks of gestation the baby was born at (McCall E.M., 2010). There was no significance difference in the plastic caps or the wrap/bag comparisons. More research was recommended because of the small sample size.

I. Discharge Criteria

The duration of hospitalization and the amount of care required for the late preterm infant has been debated for years. The majority of LPI do not need intensive care, as they are born healthy in appearance and stable physiologically, but they are not ready to be discharged with their mothers after two days. Prevention of neonatal mortality and morbidity (post discharge hospital admission or observational stay) in the late preterm infant are dependent on good care received in the hospital and adequate discharge plans or guidelines specific to the late preterm infant (Tomashek, et al 2006). Because of the higher morbidity and mortality rates for LPI, the American Academy of Pediatrics (AAP) recommends guidelines for discharge from a hospital all for high-risk babies. Discharge planning is an important aspect of patient care and should not happen until the late preterm infant is al least 48 hours old (U.S. Department of Health and

Human Services, 2013). A basic list was recommended by the Department of Health and Human Services and has been added to by individual facilities. Boarding in with the infant prior to discharge can be a practical and effective means of accomplishing all the discharge teaching and assuring the parents are comfortable with the baby and baby care. Once the baby is stable and is eating well, discharge needs and planning should include teaching the parents about infant temperature, breathing difficulties, skin color changes, successful versus poor feedings breastfeeding and potentially a supplemented feedings plan, infant illness, bathing, suctioning, clothing, environmental factors such as smoke, and humidity, developmental uniqueness of the LPI, output, stooling patterns, follow-up with the provider and when to call the provided for problems.

Infants should meet the criteria by demonstrating a pattern of weight gain, competent suckle feeding by their parent's preferred method with an developed feeding plan for discharge, maintain an adequate body temperature while clothed and without an external heat source, and to be physiologically mature, stable cardio-respiratory function, and the parents need to be able to demonstrate ability to care for the baby at home and social risk factors assessed for and addressed (AAP, 1998).

Guidelines for discharge need to include screening for car seat safety, hearing, sleep positioning, immunizations and metabolic and genetic illnesses. A car seat study completed by a trained health professional observes for apnea, bradycardia and oxygen desaturation while the infant is positioned in the car seat. Many late preterm infants do not have the neurological maturity to maintain their airway while positioned in a car seat. Car seat testing, or an Infant Car Seat Challenge (ICSC) done pre-discharge is recommended by the American Academy of Pediatrics (AAP) for all babies born less than 37 week, the gestational cut-off for pre-term

infants. Car seat testing can also be done on infants > than 37 weeks if there are other problems such as: hypotonia, respiratory issues, history of apnea, chest wall or airway anomalies or intrauterine growth restriction (IUGR) infants. Late preterm infants make up 60% of all car seat testing done and the failure rate of a LPI is 78%. Evidence indicates that babies born before term are at increased risk of adverse cardiorespiratory effects when placed in a semi-upright position, such as that typical with usual infant care seats. Absence of apnea, bradycardia and stable oxygen saturation is criteria for passing the testing.

Hearing assessment is recommended on all newborns, both full term and preterm. The hearing test is preformed by a trained health professional on both ears, results documented and the results discussed with the parents. Sleep positioning, or "Back to Sleep" is taught to parents and their ability to demonstrate safe crib safety and understanding is criteria for discharge (Carrier, 2009). Parent taught and demonstrate competency in basic newborn care, safety issues, illness and infection and expected feeding, urine, and stooling patterns.

The guidelines for discharge of the late preterm infant can vary from hospital to hospital. Since research to this newly defined group of newborns is spares, there needs to be formulating of discharge criteria. A pathway of clinical care would be useful in planning the discharge of the late preterm infant.

The parents of some preterm infants and full term infants who require special care and treatment after discharge need to learn the cares and special uniqueness of their baby. Boarding in with the baby in the parent's room is a way some facilities have helped the transition from hospital to home. Some facilities have special rooms designated for boarding in, while others place the parents and baby in a regular post-partum room. In either case, a nurse is assigned to the baby and family so education and assessments can be provided.

II. Follow-Up

The American Academy of Pediatrics recommends that the late preterm infant receives follow-up care at their primary physician one or two days post discharge. Parents of LPI may need special instruction and guidance so that a closer follow-up is required to ensure the baby is thriving at home. Before the LPI is discharged, the first outpatient visit is pre-arranged with instruction on the importance keeping that appointment so that the baby can have the weight, jaundice and feedings assessed. If a problem has been identified during hospitalization, such as breastfeeding issues of large percentage of weight loss, a home health nurse visit is sometimes arranged in place of a physician visit so soon after discharge. Lactation consultants are offered for phone consultation and/or outpatient visits post discharge where available and if insurance covers their services. Outpatient lactation services are especially needed when the mother is discharged using a nipple shield because of the risk of milk transfer problems (Meier, 2000).

There is a higher rate of re-hospitalization for the late preterm infants than the full term infants. Babies of first time parents, breastfed babies are the most at risk. One California study that spanned from 1992-2000 showed that about "15% of all preterm infants required at least one re-hospitalization within the first year of life with the average cost per readmission 8,468 dollars, average annual cost in excess of 41 million dollars. The largest cohort, infants born at 35 weeks gestation, had the highest total cost of readmission costing 92.9 million dollars" (Underwood et.al., 2007). The most common causes of re-hospitalization are acute respiratory disease, dehydration and hyperbilrubenia.

Clinical Care Pathways in Adult Medicine

Clinical pathways are being generated and implemented in medicine because of health care reform, managed care, and the current outcomes movement is proven to improve outcomes

and decrease cost. Clinical pathways in the field of neonatology are beginning to be developed. Clinical pathways coordinate patient care delivery through standardized, interdisciplinary process. The interventions of the pathway are predictable and sequenced, usually based on a timeline. Clinical pathways are outcome focused. (Schwoebel, 1999)

Standardized care is also called care pathways, clinical pathways, critical pathways or integrated care pathways. It is defined as a "concept for making patient-focused care operational and supporting the modeling of patient groups with different levels of predictability. Pathways are a method within the field of continuous quality improvement and are used in daily practice as a product in the patient record (Vanhaecht K., 2010). Hospitals have developed tools, such as the clinical pathway to improve health outcomes and promote cost-effective care have become critical as health care systems and providers assume more financial risk (Schwoebel, 1999). A clinical pathway (CP) was developed and implemented as a strategic tool to improve treatment outcomes for patients with various medical diagnoses. Pathways have been developed to improve venous leg ulcers, hip fractures, endocrine surgery, oncology care, joint arthroplasty, psychiatric care, coronary disease, asthma, total knee replacement, maternal-newborn care as well as many other disease processes. Clinical pathways are heavily used is some states that are strong in managed care, like Arizona and have been proven to have improved outcomes and a decreased cost for care. One study by Nicasio, et al. 2010, compared ventilator-acquired pneumonia with a historical medical approach and a clinical pathway. "The median VAP length of treatment was 24 days and 11 days for historical and clinical pathway groups, respectively ($p<0.001$). Daily hospital costs were similar for both cohorts over the first 7 days, after which costs declined significantly for patients treated with the clinical pathway ($p<0.001$)." Many comparison studies had similar results in adult medicine.

There is little in the literature on a complete clinical pathway for neonatology although some *aspects* of neonatal care for the very preterm and late preterm infant are standardized. The Pennsylvania Hospital developed "NeoMaps (neonatal multidisciplinary action plans)." (Schwoebel, 1999). A NeoMap contains the key activities that are done to the infant at a specific time frame. Medications, treatments, teaching, diet, are some of the subsets that are determined and ordered for the infant based on their gestational age and stability. The clinical pathways provide a standard for best practice by identifying the interventions and the desired outcomes in a cost effective way. The criticism of pathways or NeoMaps is that many people perceive it as a "cookbook" approach to medicine and nursing (Schwoebel, 1999) that is detrimental to both the patients and the practitioners because the care cannot be delivered individually according to the patient's course. They are to be considered guidelines rather than hard and fast rules of care that will work for the majority, but not all of infants. Schwoebel suggests that 20% of infants deviate from the clinical pathway.

Gaps in the Literature

The following areas are gaps in knowledge, clinical implications, and research implications for late preterm infants and clinical pathways that need to be further researched:

1. Causes for late preterm births and deliveries.
2. Recommendations for discharge, parents boarding in with infant prior to discharge and when to follow-up for best outcome.
3. Comparison of delivery of neonatal care in newborn nursery (level-I), vs. level-II and level-III nurseries.
4. The benefits of in home pre- and post breastfeeding weights.

5. Long-term outcomes of late preterm infants on a clinical pathway versus traditional care in newborn care.

6. Best feedings strategies for late preterm infants, use of feeding readiness scores, when to introduce oral feeding, infant driven feedings versus scheduled feedings.

Conceptual Framework: a nursing model of a clinical pathway for the late preterm infant

The Levine's Model of Conservation is a middle range theory that "promotes adaptation and maintains wholeness using the principle of conservation. It guides the nurse to focus on influences and responses." (Walker& Neuman, 1996) The model allows the nurse to accomplish goals at the structural, personal, and social integrity using either supportive or therapeutic interventions. This nursing model can be applied to neonatal nursing since it is a universal model and has been successfully applied to a variety of patient, ages and various types of nursing.

The model of conservation would be useful to explore the effects of the neonatal intensive care unit (NICU) nurse-parent relationship and the parent's ability to cope with the stressors while their late preterm infant is in the NICU or recently discharged from the NICU. This model's goal is conservation or "keeping together" the wholeness of the individual. The nurse uses therapeutic and supportive interventions with the conservation principles: conservation of energy, structural integrity, personal integrity and social integrity. There is disruption in the health of a neonatal family with the preterm birth or discharge of a preemie that would benefit from nursing interventions aimed at restoring health for the family and the infant. There is disruption in the health of a neonatal family with the preterm birth or discharge of a preemie that would benefit from nursing interventions aimed at restoring health for the family

and the infant (Mefford, 2004). The LPI has a lack of health and the family has interrupted process and stressors from the crises of the birth of a preterm infant. The nurse is instrumental in supporting the infant and parents through their crises so health and stability can be achieved for the family system. A clinical pathway or standardized care is an example of conservation described in this theoretical framework.

A committee made up of Association of Women's Health, Obstetric, and Neonatal Nurses Professional Association has developed guidelines for acute care of the late preterm infant. There are several aspects in the guidelines related to initial care, transitional care and formulating discharge criteria. A pathway of clinical care would be useful in planning the care and discharge of the late preterm infant.

Chapter III

RESEARCH METHODOLOGY

Introduction

There can be barriers to standardizing care using a clinical pathway for an inpatient late preterm infant. Health care providers, the baby, parents and insurance companies would all benefit from having an evidence-based pathway of care for the hospitalized late preterm infant because standardized care can promote best outcomes and decrease re-hospitalizations. The purpose of this study was to determine if hospitals are using clinical pathways to treat late preterm infants.

Research Design

This was a pilot study to further develop a plan for the quantitative and descriptive research. The quantitative aspects consisted of the number of hospitals, which are using clinical pathways to treat and care for the last preterm infant patients. A randomized and voluntary group was used to collect the data. The purpose of a pilot study was to improve the development and implementation for future studies. The strength of a pilot study is that is a key element in the design of a quality research project and that it provides opportunities to correct defects and guide the ultimate research design. A smaller sample size can be used in a pilot study, but if the size is too small, it can cause credibility and validity problems. A weakness was that it will add groundwork to the study time and financial occurrences may increase.

Sample

The random and voluntary sample was obtained by compiling a list of hospitals, which

deliver babies and provide level-I and level-II care and/or level-III care. Subjects in the sample were the acute care setting providing the care for the late preterm infants, specifically the nurseries giving the direct care to the infants. Subjects were from the Mid-west region of the United States. Both private hospitals and teaching hospitals, urban and rural facilities were used. The sample size was 58 nurseries through usable surveys. The sample size was chosen to provide a large enough sample so that the results would be considered credible.

Setting

The setting for this research project was the natural setting or field setting of the hospital environment and the particular unit's processes. The environment and processes was not be manipulated or changed in any way.

Ethical Considerations

Ethical issues are central to nursing practice. In conducting nursing research, ethics need to be taken into consideration. Two important areas of ethical consideration are rights of human subjects and freedom from harm. The factors, which were important regarding the rights of the participants, were confidentiality, anonymity and the voluntary participation. It was be ensured through an informed consent which clearly explains the study's objectives and states participants' right to accept or refuse to participate (Fowler & Chevannes, 2002). There was no harm occurring or human rights being violated it this study. All information will be confidential; and complete anonymity. Names of hospitals and the managers or educators being interviewed were withheld from the study. All interviews were voluntary, and no monetary reward was offered. Lack of monetary reward may have limited the number of respondents for the study.

Instruments Used

Variables: level-I, level-II, level-III nurseries, late preterm infants, written clinical pathway of care.

The tools used to measure the variables of the research study were the common form of measurement: an online questionnaire and telephone interview. An initial phone call to ask for permission to be used in the study was made. There was a scripted introduction email letter with details of questionnaire, and consistency will be used for each interview to ensure validity. The questions were in a consistent order, the answers were limited to a range of responses, and questions were allowed for only a minimum of explanation. An email with the questions was be offered to be sent at the beginning of the interview so the interviewee could review them before giving a response. The interviews were structured self-reports to allow the interviewer control the content of the interview. Although there is no perfect measure (Burns and Grove, 2005), all attempts were made to ensure consistency during the telephone interview. A weakness of the interview was that the information obtained must be assumed to be correct and true.

Data collection method procedure

Telephone calls to nursery and neonatal intensive care units across the country were made to the managers or educators requesting participation in an online survey for a graduate school research study that could enhance care and outcomes for all late preterm infants. If a potential respondent agreed to participate, the online survey, Survey Monkey, as emailed to them with a deadline date of 30 days.

The interviews were determined by randomly choosing the potential survey respondents and via a telephone call, requested a follow-up interview that would last 15-20 minutes. If they

agreed, an interview time was arranged at the interviewee's convenience. The interview was dictated by hand written verbatim notes.

Analysis of Data

The data obtained may have had limited analysis value because of the ordinal nature of the interview. To insure success of the analysis, the analysis of the data happened at four points of the study:

- the design stage
- planning the data collection
- after the data are collected, and
- as the report is being written, looking for weaknesses

Summary

This study tested the hypothesis that there are barriers to standardized care plans for the late preterm infant. Questions are raised if hospitals treating late preterm infants without standardized care are providing best care. More research is needed to analyze the relationship between lack of standardized care and outcomes.

Questions from the survey

1.Which level of care does your facility provide?
Level-I only_____ Level-I and-II only _____ Level-III only_____
Level-I, Level-II and Level-III_____ Level-II and Level-III_____

2. Where are stable and late preterm infants (34-37 weekers) admitted for care in your facility? Level-I_____ Level-II_____ Level-III_____Transferred to another facility _____

3. Does your unit have a clinical pathway or standardized care of the late preterm infant?
Yes_____ No_____ Comments/other_____

4. If you answered "no," what are the barriers for standardizing care for the late preterm infant?
Comments_____

5. Does your nursery have a standardized process for feeding the late preterm infant LPI?
Yes_____ No_____ Comments/other_____

6. What are the barriers for standardizing feedings for the late preterm infant (LPI)?
Comments_____

7. Does your unit have a guideline for use and discontinuation of thermal regulation (isolettes and warmers)? Our nursery has guidelines for use of thermoregulation_____
Our nursery does not have guideline for use of thermoregulation _____
Our nursery has a guideline for discontinuation of thermoregulation_____
Our nursery does not have a guideline for discontinuation of thermoregulation __
Other_____

8. Are the parents required to spend time "boarding in" with the LPI prior to discharge?
Yes, we recommend one night_____
No option for parents to "board in" at our facility_____
It is optional for parents to "board in" if they chose_____
Please comment if there are barriers to parents "boarding in" with their infant._____

9. Does your unit do car seat testing on **all** late pre term infants?
Yes, transitioned to a crib _____
Yes, within one week of discharge _____
Yes, within 24 hours of discharge _____
Yes, but no set day_____
No mandatory testing_____
Comment as to any barriers to standardizing car seat testing_____

10. When is follow-up ordered for the discharging late preterm infant?
1-3 days post discharge_____ 3-6 days post discharge_____
1-2 weeks post discharge_____ It depends on the provider_____

CHAPTER IV

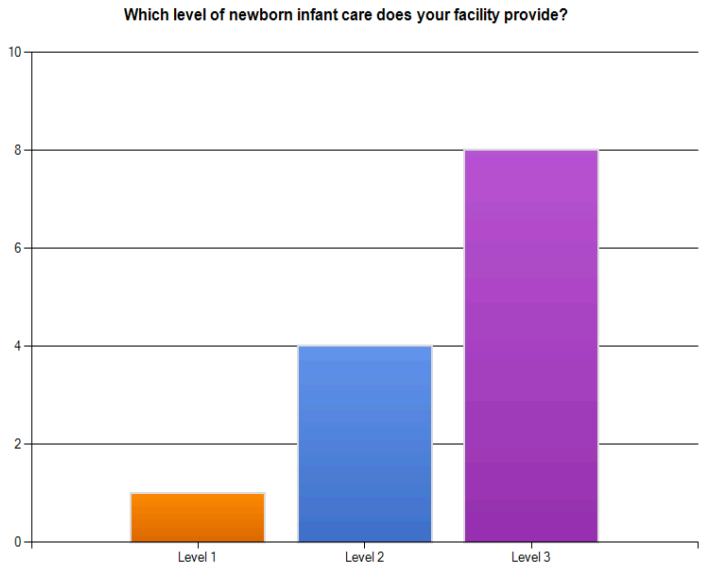
FINDINGS

Sample Description

Fifty-eight electronic surveys were sent out to hospitals in the upper Midwest that have level I, level II and/or level III nurseries. Anonymous surveys were obtained from urban areas, mid-level towns and rural areas. Of these fifty-eight distributed surveys, nine were returned, one hospital had a level-I nursery only, four had level-II nurseries, and eight had level-III nurseries. Each hospital delivers babies and routinely cares for the late preterm infant or transfers them out to a higher level of care facility. All of the respondents were nurse leaders, either a nurse manager, charge nurse or a nurse educator from that nursery. The education level of the respondents ranged from associate degree, bachelor degree and Master's degrees. The age and years of experience of the respondents is unknown.

Table 1

Level of Infant Care Facility

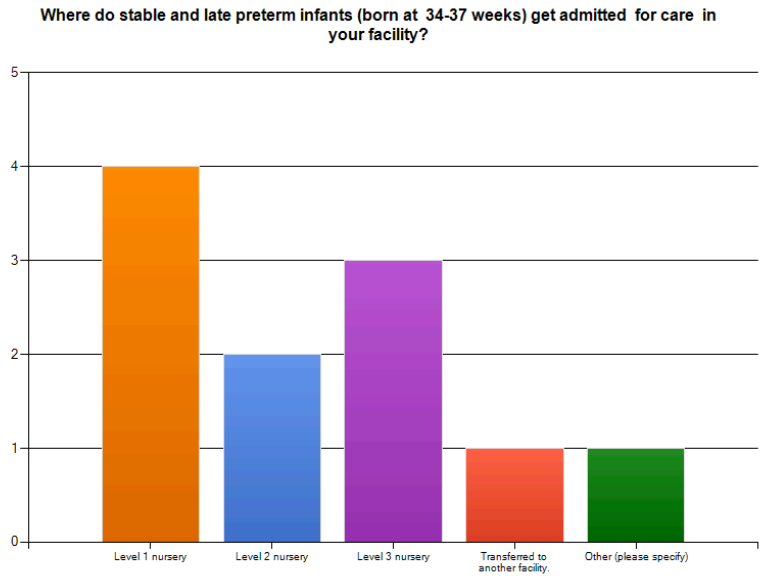


The majority of the respondents were from a level-III nursery. The lowest response was from a level-I only facility. Surveys were sent to an equal percentage of each level nursery. Some facilities had all level-III nurseries, some were only a level-I nursery and a few had both levels-II and -II nurseries.

In multi-level nurseries, babies born at that particular facility or those being transferred from another facility, a baby would get admitted into one particular nursery for the appropriate level of care.

Table 2

Where Stable Late Preterm Infants Get Admitted

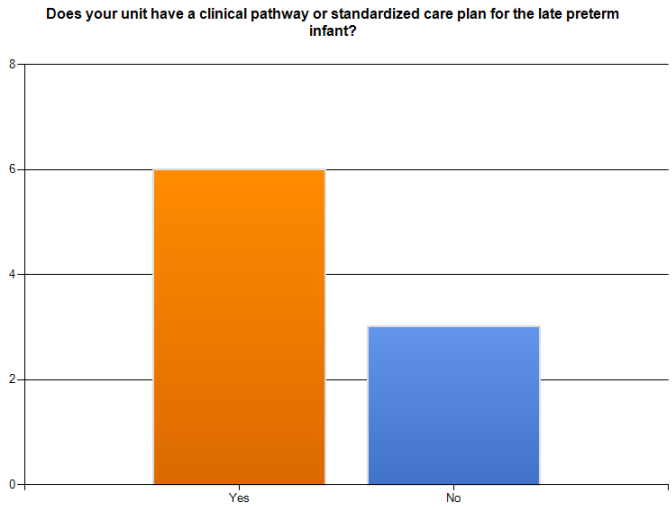


When the gestational age of a baby is know, an assessment is made on the baby in the delivery room and a decision is made as to where it will be admitted to. Level-I nurseries have the least amount of nursing care and support with the much care done by the mother. Level-III nurseries are the highest level of nursing care and have a 1:1, 1:2, or 1:3 patient to nurse ratio.

About half of the respondents admit their late preterm babies to a level one nursery. Three of nine respondents admit their late preterm infants to a level-III nursery. One respondent transferred their stable late preterm babies to another facility because they lacked the ability to care for infants other than stable term infants. One respondent commented that the all 34-week preterm infants went to a level-III nursery and the 35-37 week infants were admitted according to how stable they were. Another respondent stated that late preterm infants were always admitted to the level-II nursery, but they policy had recently changed and LPI 34-37 weeks were now all admitted to level-I unless they were unstable and needed oxygen. Twenty-two percent were automatically admitted to a level-II nursery based on gestational age.

Table 3

Standardized Care



Standardized care included in the survey addressed several interventions:

- standardized feedings (when to begin breast feedings, when to begin bottle feeding, use of slow flow nipples, pre- and post weights for breastfeeding, use of lactation consultant, use of feeding readiness scales)
- standardized thermoregulation for LPI
- car seat testing on all LPI
- discharge criteria specific to LPI
- optional or mandatory parents boarding in with LPI baby prior to discharge
- standardized follow-up with primary care provider.

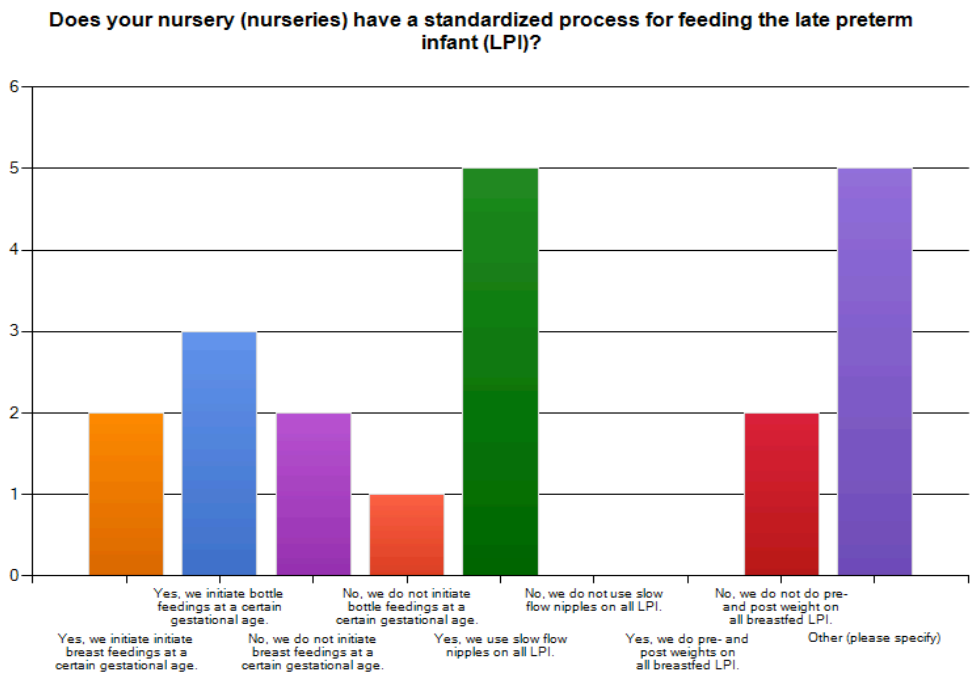
One third of respondents reported that their nursery had standardized care for the late preterm infants (LPI) and two thirds did not have standardized care. Some of the facilities standardized

some of the interventions, while other facilities did not. One respondent said their current standard is a broad guideline "covering preterm infant as a whole" and one respondent was unsure if any such standardized care plan existed for the late preterm infant and relied on the order sets for all babies, preterm and full term.

One of the questions on the survey asked what were the barriers to implementing a standardized care plan and all respondents said there were no barriers. However, when interviewing five of the respondents, all five said in the interview that there were barriers to standardizing cares, particularly feedings. The barriers cited were physicians, nurse's experience and opinions, where the infant was admitted to and the physical space on the unit.

Table 4

Standardized Feedings

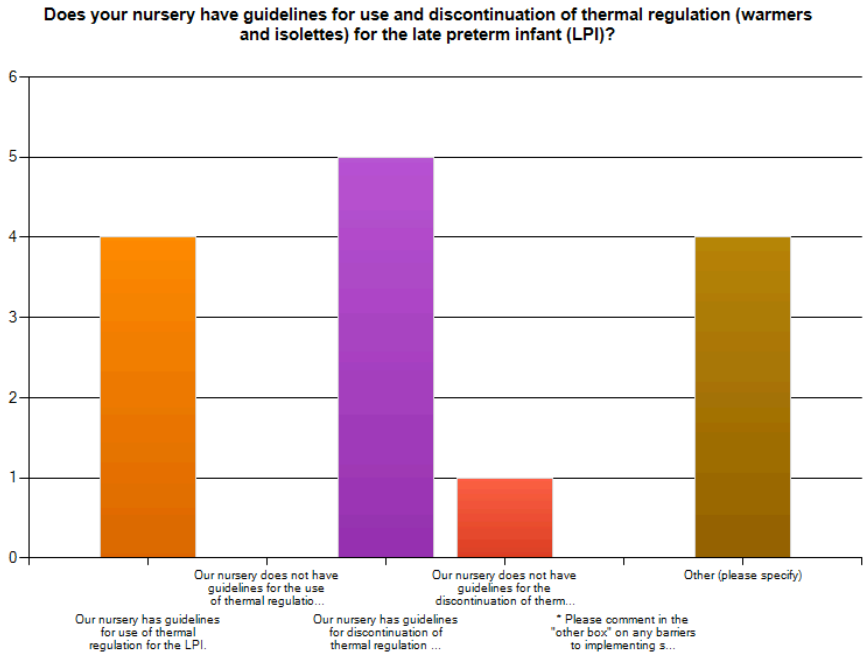


The majority of respondents had a partial standardized feeding regimen for the late preterm infant. The use of the slow flow nipple was the most common standardized practice done and it is widely researched as best nipple for pre-term infants. Fifty-five percent of the respondents used a slow flow nipple on the late preterm infants. The initiation of bottle feedings and breast feedings was low with a frequency of 2 for initiating breastfeeding at a certain gestational age and 3 for the initiating bottle feedings at a certain gestational age. Eleven percent of respondents said they do not limit initiating any type of feeding at any age, but go by the desire and cues of the late preterm infant. Use of pre- and post breastfeeding weights were done in level II & III nurseries, but none of the level-I nurseries used the weights. Some nurseries allow LPI to initiate breastfeeding if they are showing cues during a "kangaroo care" or mother-infant skin-to-skin session. Other nurseries hold off any breastfeeding, despite baby's cues until they reach 36 weeks gestational age. Some level 3 nurseries utilize "*feeding readiness scales"* which objectively give a score to the baby on his or her readiness cues and they initiate oral

feedings based on those scores. The feeding readiness scales are an infant-driven feeding score based on infant behaviors observed by the nurse or parent to determine if oral feedings will be attempted. *Appendix 1.* There is a "*feeding quality scale"* used to determine the quality of the infant's ability to suck and swallow the feeding and sustain the oral feeding. *Appendix 2.* Feeding readiness and quality feeding scales are considered a part of a clinical pathway for late preterm infants. Mostly the level-III nurseries in the survey used clinical pathways or standardized care.

Table 5

Standardized Thermoregulation

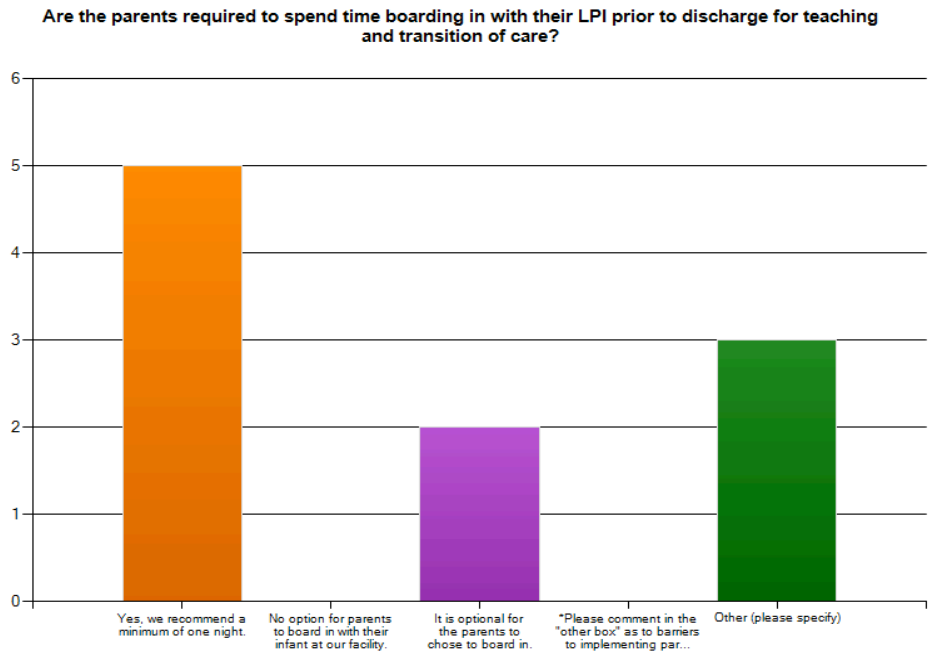


Standardized thermoregulation was used and stated by 44.4% of the respondents and a standard of discontinuing thermoregulation by 55.6% of the respondents. Some facilities have a

standard of care for use of thermoregulation for all babies, and not specific to late pre-term infants. Some level-I nurseries do not use thermoregulation at all and if it is needed after several nursing interventions to warm the baby, the physician is called and the infant is transferred to level-II or III nursery. All of the respondents who have standardized thermoregulation were from level-II & III nurseries.

Table 6

Standardized Boarding In

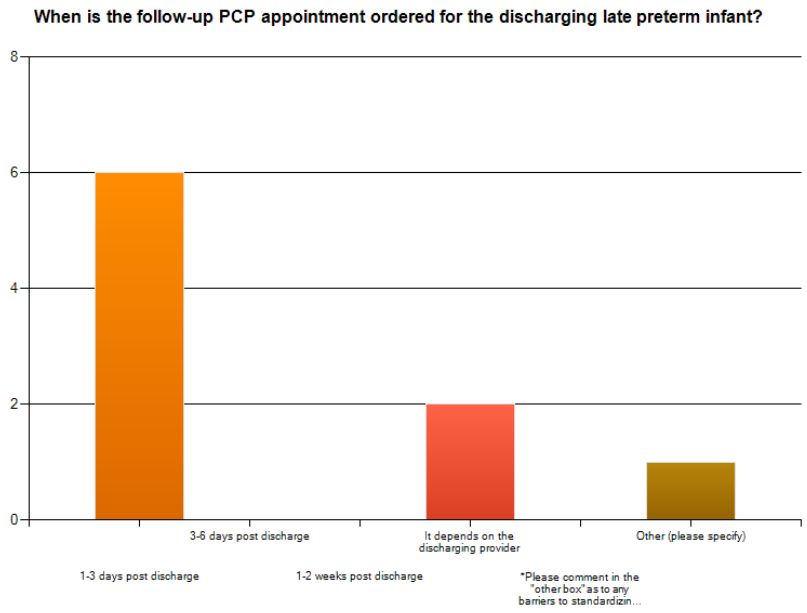


Boarding in with baby prior to discharge as an option for parents to experience caring for their late preterm infant was recommended by 55.6% of the respondents. Twenty-two percent of respondents had boarding in as an option for parents who wish to do so, but it was not recommended by the staff or encouraged. Level-I nursery respondents encourage parent to keep

the baby in the parent's room instead of placing baby in the nursery. One respondent had the option of boarding in available for the parents of the sickest babies only. The stable late preterm babies stayed in the nursery while the parents styed down the hall in a patient room. Some of the interviewed respondents stated that their facility had a space problem and it was difficult to honor the request of parents wishing to stay after discharge if the preterm infant required a longer hospitalization.

Table 7

Standardized Primary Care Provider Discharge Appointment

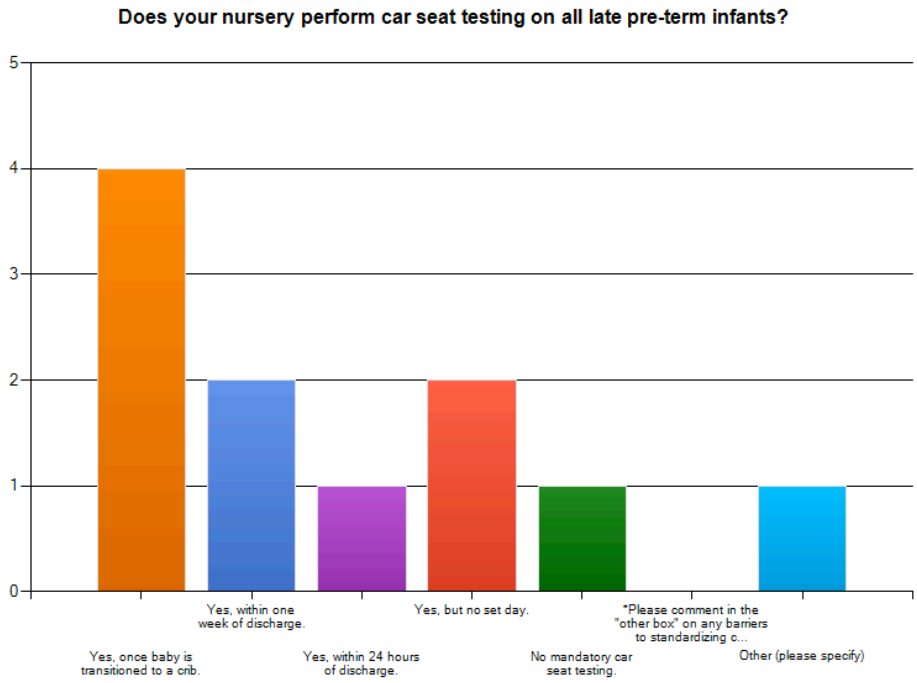


Babies who are ready for discharge from the acute care or intensive care settings are ordered for a discharge follow-up appointment with the primary care provider (PCP). The date of the PCP appointment can vary depending on the status of the baby and the ordering habits or wishes of the provider.

In the survey on late preterm infants, 66.7% responded that the follow-up PCP appointment is always made 1-3 days post discharge. None of the respondents had the follow-up appointments made 3-6 days post discharge. Twenty two percent of respondents make the post discharge appointments based on the physicians, which vary from physician to physician and from baby to baby. One respondent does a weight and bilirubin checks in 2 days (not a physician appointment) and always followed up in two weeks on all late preterm infants.

Table 8

Standardized Car Seat Testing



The survey revealed that 89% of the respondents performed a pre-discharge car seat testing on their LPIs. There were an 11% of respondents who did not perform car seat testing on

their late preterm infants.

The time of when the car seat testing was performed varied. Twenty two percent of respondents had no set day for the car seat testing and was randomly chosen by the nurse. The respondents stated 44.4% performed car seat testing once the baby had successfully transitioned from thermoregulation to a crib or bassinet. The survey revealed that 22.2% were tested within one week of projected discharge and 11.1% were tested within twenty-four hours of discharge. Other criteria that had to be met are: weaned out of the isolette, three days spell free, off oxygen or the removal of a feeding tube. Some facilities, which have level-I, -II and -III nurseries had differing times when the car seat testing was done according to which nursery the baby was in. Most often, there was a set time for a level-III baby (such as within a week), but not set time for a level-I baby.

Interviews of Respondents

As a follow up to the survey, interviews were obtained from five nurse leaders from a level 1 or 2 nursery. One hospital had a level 3 nursery in the facility. One nurse leader was responsible for both a level-I & II nursery and the remaining four nurse leader was responsible for a level one nursery only, but the facility had a as a level-II as well. Interviews were obtains with five of the nurse leaders from the list who were sent a survey. Four of the interviews were done over the phone. One interview was done in person. The length of each interview was between 15-20 minutes and the answers were recoded verbatim.

The interviewees were asked five questions and were their responses were recoded verbatim in Appendix 3. The findings of the interviews revealed some major themes.

- All of the level I nurseries did more frequent vital signs on late preterm infants. They also check the infant's blood sugar at least initially and most of the time would follow-up if the initial blood sugar was low.
- All nurseries performed car seat testing on babies born less than 37 weeks prior to discharge to check for tolerance of positioning in the car seat and apnea, but were varied as to when the testing occurred.
- None of the level-I nurseries had standardized feedings for late preterm infants. Some of the level-II nurseries had partial standardized feedings protocols.
- None of the level-I nurseries performed pre- and post breastfeeding weights to assess for volume intake on late preterm infants.
- None of the level I nurseries utilized "feeding readiness scores" or "feeding quality scores on late preterm infants." None of the level-I nurseries used "feeding readiness scores," but some level-II nurses observed for infant feeding cues.
- 4/5 of the nurseries did not have an automatic lactation consult for mother's of late preterm infants. Although all 5 nurseries had access to lactation services if the mother needed or desired it.
- All the nurseries used thermoregulation as needed for late preterm infants, but none of the level-I or II nurseries had the use or discontinuations standardized.
- All of the level I and some of the level-II nurseries felt physician resistance was a barrier to standardized care.
- 4/5 of the nurseries felt nursing staff resistance was a barrier to standardized care.
- 4/5 of the nurseries did not feel that parent resistance was a barrier to standardized care.

Chapter V

DISCUSSION

The purpose of this study was to describe the use of standardized care pathways for late preterm infants in all types of nurseries. That the majority of survey respondents were nurse leaders at a level-III nursery, suggests nurses who manage or educate staff who provide complex acute care might be more interested in standardizing care for late preterm infants than those who care for stable infants in a level-I nursery. Also, about 44.4% of respondents worked in both the level-I and level-II nurseries at their respective hospital. Since there are many more level-I nurseries in the United States than the more specialized level-III nurseries, it is possible that nurse leaders of nurseries that provide more acute care are more interested in research and therefore wanted to participate in this study.

The survey findings indicate that stable late preterm infants are admitted to a variety of nurseries. A standardized pathway is not used to determine which nursery will receive the infant. Instead that decision is based on the infant's weight, gestational age and/or stability. Also, some facilities have an age cutoff and transfer the baby to another facility even if the infant is stable.

Admitting LPI to a level-I nursery was the most common finding in the survey. Even though it has the least amount of standardized care, the advantage of this procedure is that the infant is not separated from his or her mother and that breast feeding can occur more readily than when the mother-infant couplet is separated on two different units or facilities. A downside to admitting to a level-I nursery relates to the type of care provided. Unless the nursery has staff

trained and educated in late preterm nuances and uniqueness and there are order sets specifically for the LPI, the babies may be treated as a full-term newborn and not receive the care necessary for it's gestational age and development. Also, the infant could be discharged before the risks associated with being born a few weeks early become apparent and lead to compromised outcomes.

One finding is that late preterm infants admission into a level-I nursery may be a barrier itself because the infant is treated and cared for as a full term infant because of the lack of standardized care. Both the survey and the follow-up interview revealed that a level-I nursery has the least amount of standardized care for the late preterm infant and the level-III nurseries have the most standardized care.

The finding that a majority of respondents use a standardized care plan is most likely related to those respondents being from a level-III nursery. Level-III nurseries have many guidelines to direct care because of the acuity level of patients. Given the stated risks for the late preterm infant, the standard should be that all late preterm infants receive the same care. Even though the majority of respondents reported using some aspects of standardized care, many level-I and -II nurseries lack standardized care plans completely. Thus, it seems reasonable to conclude that most late preterm infants probably do not receive care appropriate to their level of development.

Barriers to standardizing feedings from the survey and interview results are discussed. Most of the survey respondents stated they did not think there was any barriers to standardizing feedings and most of the interviewed respondents mentioned that the physicians and nursing staff were barriers. Many physicians manage their own late preterm infants in the various level-I or

level-II nurseries and there were variations between the pediatrician groups and variations within a group. One could conclude that the many variations of care by being admitted to the various level of care nurseries are barriers to standardized care.

Likewise, none of the survey respondents, but 80% of the interviewees said that some of the nurses were barriers to standardizing care because some nurses had less experience or had attitudes that were not open to change. Parents and administration were not cited as a barrier to standardized care for the late preterm infant. The nursery and nursing unit physical space was cited by 40% of the interviewees as a barrier to standardizing a better system of discharge for the late preterm infant.

Only 22% of survey respondents initiate feedings, either breast and 33% initiate bottle feedings at a certain gestational age any where from 34-36 weeks, per the unit guideline. The majority of respondents does not initiate feedings any certain gestational age and do not use feeding readiness scores. The respondents that were from a level-I nursery did not use an objective way of determining if the baby breastfed enough volume, such as the pre- and post weights. They relied on nursing judgment to determine success of feedings. None of the level-I nurseries that cared for late preterm infants used pre- and post weights, but stated they relied on nurse's observation and mother's report of the feeding success. The late preterm has the ability to suck well at the breast but not get enough volume.

The practice of using evidence-based slow flow nipples for all bottle feedings was only practiced by 55% of the respondents showing the high correlation of level-III survey respondents. This could also reflect that level-III nurseries, the majority responders, have

occupational and speech therapists that are recommending slow flow nipples and in level-I and – II nurseries, there is less often feedings specialists to make suggestions.

Feeding readiness scoring was done only by 20% of the respondents and only from level III nurseries. None of the level-I nurseries used either the feedings readiness or the feedings quality scoring as objective tools for standardizing practice of the late preterm infant. With the literature establishing the risk of the late preterm infant in regards to feedings (Thoyer et al., 2005), growth issues and dehydration potential, it is remarkable that level-I nurseries are not practicing objective feedings protocols or are proactive in standardizing their feeding protocols.

The use of thermoregulation on the late preterm infant in nurseries is common, but not an inevitable intervention. The survey suggests that guidelines are seen more often in level-III nurseries, but not as often in level-II nurseries and no guidelines for use or discontinuation in level-I nurseries. About half of the respondents used thermoregulation and did have a guideline or policy for the use of and/or discontinuation of the warming intervention. Without a guideline for using thermoregulation, a conclusion could be made that the use and discontinuation of thermoregulation was based on the subjectivity of the nurse. Having no guideline or standardizing the use and discontinuation of thermoregulation is that some late preterm babies would need thermoregulation, but not receive it causing baby experiences cold stress; and some babies who need thermoregulation stay in it beyond the infant requiring it. The lack of standardization can actually delay discharge for days, successful progression of feedings and potential growth issues in the infant.

Preterm infants, especially late preterm infants are more likely than term infants to develop temperature instability, hypoglycemia, respiratory distress, jaundice, feeding problems,

and to require re-hospitalization in the first 2 weeks post birth. Only about a half of the respondents recommended boarding in at least one night with their late preterm infant. The lack of standardized care regarding discharge could lead to poor outcomes for the infant once they are home.

Two aspects of discharge planning, the follow-up provider appointment and car seat testing were varied. Car seat testing was 100% for late preterm infants across all nurseries. It is possible that because the AAP recommends car seat testing that there is such good compliance. Which begs to ask, if the APA recommended standardizing care for the late preterm infant, would nursery staff and physicians be more apt to act in accordance? Would there be less barriers if the influence of the APA help set care for the late preterm infant?

Summary

The survey and follow-up interviews revealed variation in standardized care for late preterm infants across nurseries. The most frequent barriers cited were physician preference for ordering, nursing staff attitudes and nurses' experience level. Less frequently cited barriers were facility space and parents wishes. The barriers most cited could reflect a lack of knowledge and training specific to the late preterm infant for both the nursing and medical staff. That the majority of level-I and level-II nurseries do not have standardized care or only minimal standardized care, indicates a lack of knowledge about and/or a lack of valuing of the literature on late preterm infants' medical needs and risk for post discharge morbidity among the staff in these institutions.

Limitations

Interpretation of the study findings is limited in several ways. First, the convenience sample is small and the respondents were not equally distributed across level-I, -II and -III nurseries. Since most respondents practiced in a level-III nursery, the sample is not representative of all nurseries that care for late preterm infants. Thus the findings probably only apply to those nurseries caring for the least stable infants.

Second, the items on the survey addressed only six of the thirteen practices recommended for late preterm infant care. Thus, the study findings do not provide a complete description of the care provided to those infants. A comprehensive survey, which addresses each of the recommended care practices for the late preterm infant, would have produced a more complete assessment of care practices in level-I, -II, and -III nurseries.

Third, only nurses in the upper mid-western states were recruited for the study. There can be regional differences in other parts of the country that could affect care practices for late preterm infants. Finally, the survey was sent to nurse leaders in the nurseries instead of staff nurses directly providing the care. These nurse leaders may have a very different perspective on barriers to standardized care than the staff nurses who actually provide the care to the infants and their families.

Implications for Nursing Practice and Education

Despite the limitations, the findings of this study have importance for nurses, educators and researchers. Although the majority of late preterm infants do well, clinicians must recognize that, as a group, these babies have an increased risk of mortality and morbidity post discharge. Pediatricians and nurses involved in discharging these infants and planning their follow-up care,

need to be aware of these increased risks. They need to collaborate and provide the infant's parents/families with care instructions that address these risks. The findings of this study suggest that nurses need to examine the barriers that exist to creating standardized interventions/protocols within their nursery in order to ensure the best care for all late preterm infants.

In addition, nurses, especially nurse leaders, and physicians need to be familiar with and understand current research about preterm care that promotes optimal outcomes. This means increased unit-based annual and/or continuing education of staff. Circulating current research and professional nursing journal articles could be one method of providing such information. Staff development efforts that increase the level of care for newborns in facilities with only a level-I nursery could prevent excessive or unnecessary patient transfers and keep the mother/baby couplet together until discharge. Also, creating a collaborative environment in which nurses and physicians discuss changing practice could improve care for late preterm infants.

Implications for Research

An interesting future study would be to examine differences in educational level or gender differences and their impact on barriers to standardizing care for the late preterm infant. It would also be useful to survey physicians overseeing the care of late preterm infants since they were listed as a barrier to standardizing care.

A number of organizations including The March of Dimes, the Institute of Medicine (IOM), the National Institute of Child Health and Human Development, and the Association of Women's Health, Obstetric and Neonatal Nurses have called for increased research to determine

appropriate management of late preterm infants (Raju 2006, Medoff-Cooper et al 2005, IOM 2006, March of Dimes 2006). Nurses can initiate and participate in research to help overcome barriers that prevent standardized care and best practice from occurring in all nurseries.

References

Adamkin, D. H. (2006). Feeding problems in the late preterm infant. *Clinical Perinatol, 33. 831-837.* Retrieved April 5,2011, from http://www.researchgate.net/publication/6651155

American Academy of Pediatrics. (1998), Committee on Fetus and Newborn: Hospital discharge of the high-risk neonate—Proposed guidelines-*Pediatrics* 102:411. Retrieved May 20, 2013, from http://www.aap.org.

Andriessen, A. E., Polignano, R., & Abel, M. (2009). Development and implementation of a clinical pathway to improve venous leg ulcer treatment. *Wounds: A Compendium of Clinical Research & Practice, 21*(5), 127-133.

American College of Obstetricians and Gynecologists. http://www.acog.org.

Carrier, C. T. (2009). Back to sleep: A culture change to improve practice. *Newborn & Infant Nursing Reviews, 9*(3), 163-168.

Committee on Fetus and Newborn. (2004). Policy Statement: Levels of Neonatal Care. *Pediatrics, 114*(5), 1341-1347. Retrieved April 4, 2011. doi:10.1542/peds.2004-1697.

Engle, W. A., Tomashek, K. M., Wallman, C., & Committee on Fetus and Newborn. (2007). "Late preterm" infants: a population at risk. *American Academy of Pediatrics, 120*(6),1390-1398. Retrieved May, 31, 2011. http:www.apa.org. doi:10.1542/peds.2007-2952.

Engle, W. A., Tomashek, K. M., & Wallman, C. (2007). "Late-preterm" infants: A population at risk. *Pediatrics, 120*(6), 1390-1401.

Feuth, S., & Claes, L. (2008). Introducing clinical pathways as a strategy for improving care. *Journal of Integrated Care Pathways, 12*(2), 56-60.

Fowler, J., Jarvis, P., & Chevannes, M. (2002). Practical statistics for nursing and health care. *European Diabetes Nursing, 3*(1), 27. Retrieved Mar 13, 2011. http://onlinelibrary.wiley.com.

Hubbard, E., Stellwagen, L., & Wolf, A. (2007). The late preterm infant: A little baby with big needs. *Contemporary Pediatrics, 24*(11), 51-58.

Hurst, W. M., Meier, P. P., Engstrom, J. L., & Myatt, A. (2004). Mother's performing in-home measurement of milk intake during breastfeeding of their preterm infants: Maternal reactions and feeding outcomes. *Journal of Human Lactation*, *20*(2), 178-187.http://dx.doi.org/10.1177/089033440264168

Institute of Medicine. Preterm birth: causes, consequences, prevention. Available at: www.iom.edu. Accessed May 15, 2013.

Jones, M., Day, S., Creely, J., Woodland, M. B., & Gerdes, J. B. (1999). Implementation of a clinical pathway system in maternal newborn care: A comprehensive documentation system for outcomes management. *Journal of Perinatal & Neonatal Nursing, 13*(3), 1-20.

Ludington-Hoe, S., Anderson, G. C., Swinth, J. Y., Thompson, C., & Hadeed, A. J. (2004). Randomized controlled trial of kangaroo care: Cardiorespiratory and thermal effects on

healthy preterm infants. *Neonatal Network, 23*(3), 39.

March of Dimes. March of Dimes urges federal support for IOM prematurity report. Available at www.marchofdimes.com. Accessed May 15, 2013.

McCall, EM, Alderdice, F. Halliday H.L., Jenkins J.G., Vohra, S. (2010). Intervention to prevent hypothermia at birth in preterm and/or low birth weight infants. *Cochrane Database of Systematic Reviews,* 2010, 3(1). Retrieved January 30, 2011. DOI:10.1002/14651858.CD004210.pub4.

McCormick, M.C., Escobar, G.J., Zheng, Z., et al. (2006). Place of birth and variations in management of late preterm(near term) infants. *Seminar Perinatol*ogy, 2006;30(1):44-7.

McLauren, K. K., Hall, C. B., Jackson, A. E., & Mahadevia, P. J. (2009, February). Persistence of morbidity and cost differences between late preterm and term infants during the first year of life. *Pediatrics,* 123(2), 653-659. Retrieved May 15, 2013 from http://web.ebscohost.com.ezproxy.mnsu.edu/ehost.detail?hid=106&sid.

Medoff-Cooper, B., Bakewell-Sachs, S., Buus-Frank M.E., Santa-Donato, A. (2005). The AWOHNN near-term infant initiative: a conceptual framework for optimizing health for near term infants. *Journal of Obstetric, Gynecologic and Neonatal Nursing.* (5);34:666-671

Mefford, L. C., (2004). A theory of health promotion for preterm infants based on Levine's Conservation Model of Nursing. *Nursing Science Quarterly, 17*(3), 260-267.

Retrieved February 10, 2011 from Http:// www.nsq.sagepub.com/content.17/3/360

doi:10.1177/0894318404266327

Meier, P. P., Brown, L. P., Hurst, N. M., Spatz, D. L., Enstrom, J. L. & Borucki, L. C. (2000) Nipple shields for preterm infants: Effect on milk transfer and duration of breastfeeding. *Journal of Human Lac*tation.16(3), 106-114.

Meiers, P. P., Furman, L. M., & Degenhardt, M. (2007). Increased lactation risk for late preterm infants and mothers: evidence and management strategies to protect breastfeeding. *Journal of Midwifery Woman's Health*, *52*(6), 579-587.

Nicasio, A. M., Eagye, K. J., Kuti, E. L., Nicolau, D. P., & Kuti, J. L. (2010). Length of stay and hospital costs associated with a pharmacodynamic-based clinical pathway for empiric antibiotic choice for ventilator-associated pneumonia. *Pharmacotherapy, 30*(5), 453-462.

Raju T.N., (2006) Introduction. *Seminar Perinatology.* 30:2-7

Raju, T. N., Higgins, R. D., Stark, A. R., MD., & Levenol, K. J., MD. (2008). Optimizing care and outcome for late-preterm (near-term) infants: A summary of the workshop sponsored by the National Institute of Child Health and Human Development. *Shouxi, 6*(12), 573-582.

Stark, A.R.(2004). American Academy of Pediatrics, Committee on Fetus and Newborn. Levels of neonatal care [published correction appears in *Pediatrics*. 2005;115:1118]. *Pediatrics.*

114:1341-1347.

Schwoebel, A., & Jones, M. (1999). A clinical pathway system for the neonatal intensive care nursery. *Journal of Perinatal & Neonatal Nursing, 13*(3), 60-69.

Tomashek, K. M., Shapiro-Mendoza, C. K., Weiss, J., Kotelchuck, M., Barfield, W., Evans, S. & Declerra, E. (2006). Early discharge among late preterm and term newborns and risk of neonatal morbidity. *Seminars in Perinatology*, *30*(2), 61-68.

Underwood, M. A., Danielsen, B., & Gilbert, W. M. (2007). Cost, causes and rates of re-hospitalization of preterm infants. *Journal of Perinatology, 27*(10), 614-619.

Vanhaecht, K., De Witte, K., Panella, M., & Sermeus, W. (2009). Do pathways lead to better organized care processes? *Journal of Evaluation in Clinical Practice, 15*(5), 782-788.

Vanhaecht, K., Panella, M., van Zelm, R., & Sermeus, W. (2010). An overview on the history and concept of care pathways as complex interventions. *International Journal of Care Pathways, 14*(3), 117-123. Retrieved Mar 15, 201. doi:10.1258/jicp.2010.010019

Viral, D. A., & Campbell, D. E. (2008). Ch 92. In *Care of the Late Preterm Infant* (pediatric care online) [Online textbook]. Retrieved April 5, 2011, from American Academy of Pediatrics website: http://www.pediatriccareonline.org/pco/ub/pview/AAP-textbook-of-Pediatric-Care

Walker, P. H., & Neuman, B. (1996). *Blueprint for Use in Nursing Models: Education, Research, Practice & Administration*. New York, NY: National League for Nursing.

Wang ML, Dorer DJ, Fleming MP, et al. Clinical outcomes of near-term infants. *Pediatrics* 2004;114:2

www.guideline.gov/content.aspx?id=24066&search=preterm+infant National Guidelines Clearing House for Late Preterm Infants. Accessed February, 2012.

Young, P. C., Glascow, T. S., Mstat, X. L., Guest-Warnik, G., & Stoddard, G. (2007). Mortality of Late-Preterm (Near-Term) Newborns in Utah. *Journal of American Academy of Pediatrics*, *119*(3), 659-665. Retrieved February 20, 2012 from http://dx.doi.org/10.1542/peds.2006.2486

Appendix 1

Feeding Readiness Scale

1	Drowsy, alert or fussy prior to care. Rooting and/or hands to mouth, takes pacifier. Good tone.
2	Drowsy or alert once handled. Some rooting or takes pacifier. Adequate tone.
3	Briefly alert with care. No hunger behaviors. No change in tone.
4	Sleepy throughout care. No hunger cues. No change in tone.
5	Needs increased oxygen with care. Apnea and/or bradycardia and/or tachypnea over baseline with care.

Appendix 2

Feeding Quality Score

1	Nipples with a strong coordinated throughout feeding.
2	Nipples with a strong coordinated suck initially, but fatigues with progression.
3	Nipples with consistent suck, but difficulty coordinating swallow; some loss of liquid or difficulty pacing. Benefits from external pacing.
4	Nipples with a weak/inconsistent suck. Little to no rhythm. May require some rest breaks during feeding.
5	Unable to coordinate suck/swallow/breath pattern despite pacing. May result infrequent or significant A/B spells or large amount of liquid loss and/or tachypnea significantly above baseline with feeding.

Appendix 3

Interview

Interview A: Interviewee is the manager of post partum, level I nursery and labor and delivery. She has been employed at that facility for 28 years and has been in her role for 12 years. She has her master's degree. Hospital also has a level 2&3 NICU down the hall. It is a large urban hospital. Pediatrician and a pediatric nurse practitioner write orders for care.

Question #1: Are the late preterm infants treated differently in your unit than the full term infants? If so, how are they cared for differently from the full term infants?

Answer: Our late preterm infants have temperatures checked every 4 hours, they are placed in isolettes for first shift and if they can maintain their temperatures, they get to go to a bassinet. They get blood sugars checked a minimum of three times after birth. They have automatic car seat testing done during their nursery stay Lactation consultant is an automatic referral. There are no special feeding regimes that are different. In every other way, they are treated like the full terms.

Question #2: Standardized care for the late preterm infant involves feedings and use of feeding readiness scores and the pre- &post weights, discharge criteria, car seat testing, thermoregulation, primary care provider post discharge follow-up appointments and boarding in with the infant if baby needs a prolonged hospitalization. Does your unit have a standardized care plan for the late preterm infant involving some or all of these things?

We have standardized car seat testing on all babies born less than 37 weeks gestation. PCP follow-up appointments are generally 1-3 days post discharge, but honestly, there are some exceptions by some physicians. No, for feedings and no, for the "feeding readiness scores." NO for the pre- and post scales although our lactation consultants would love to use them, we have decided to reserve their use for in the NICU only. I think they use them in the NICU, but we don't use them in level I nursery, we do not have a standard of care for feeding late preterm infants. Our discharge criteria are that they are physiologically stable and successfully feeding. Thermoregulation is not standardized, but we do use it if the baby needs it. We try to wean them from it once or twice a day and challenge them if they can stay warm.

Question #3: In my survey, several hospitals responded they haven't they haven't implemented standardized care because of physician resistance. I'm wondering if your unit has experienced physician resistance in term of practice change? Is there other resistance such as nursing staff, administration, facility restraints or parent satisfaction?

Yes, definitely physician resistance and physician agreement on how things should be done. It is political at times. Some pediatricians resist calling the neonatologists and want to manage late preterm babies themselves. There doesn't seem to be resistance from nursing. We have many new nurses who go with the flow, but benefit from a more standardized plan of care. This is a teaching hospital and each patient is cared for in a team approach. There is less continuity in the level one nursery from week to week because of a new rounding physician. We also have facility restraints; space and money restraints mostly. As far as parents go, most want what is

best for their baby, whether is it a prolonged hospitalization or a transfer to the NICU. There are some who do not understand, but most are compliant.

Question #4: Nationally, we know that initially the late preterm baby does well most of the time in the first few days of life, then often cannot sustain with as many as 20% getting re-admitted within two weeks of birth. Are you aware of any post discharge complications for LPI?

I do not believe the re-admission rate is that high, at least with our babies. We make sure they are stable and feeding well before discharge and they get good follow-up. Some are re-admitted, mostly for phototherapy as babies spike their bilirubin levels in 5 days. Some are challenging breast feeders and the mother's may refuse to supplement once at home and those babies get admitted for dehydration. There may be a few who get re-admitted for RSV during the winter months by week two.

Question #5: Do you think your clientele would be opposed to extended length of stay in the nursery for their late preterm or increased follow-up post discharge?

No, our clientele want what is best for their baby. We routinely transfer babies to the NICU if unstable or keep babies in the level I nursery beyond the mother's discharge if the baby needs to stay. We get very little complaints or push back. Our level 2 & 3 nursery is in the same building and down the hall so they feel good about that.

Interview B: Interviewee is a nurse educator on a unit that oversees post partum, level I nursery and labor and delivery. She has been employed at that facility for 12 years and in her role for 3 years. She has a bachelor's degree. There is a level II and level III nursery in the hospital facility. The hospital serves as the only hospital in a mid-sized town and has a rural demographic. Pediatricians write orders for care.

Question #1: Are the late preterm infants treated differently in your unit than the full term infants? If so, how are they cared for differently from the full term infants?

No, the late preterm infant, it they are stable enough to be level I, are treated the same as a full term infant. It they are not as stable as a full term infant, they get transferred to the NICU. We automatically transfer all 34 weekers and below to the NICU. Vital signs are the same on all babies. Every 4 hours for the first twelve hours then they go to BID. If a baby is having a hard time maintaining it's temperature, the nurse will intervene and check the temperature more frequently per our standing order set. Discharge criteria is the same for all babies. If a late preterm baby doesn't feed well, it may end up staying after the mother is discharge. The nursing staff is very good about advocating for poor feeders so that they don't get sent home too early.

Question #2: Standardized care for the late preterm infant involves feedings and use of feeding readiness scores and the pre- &post weights, discharge criteria, car seat testing, thermoregulation, primary care provider post discharge follow-up appointments and boarding in with the infant if baby needs a prolonged hospitalization. Does your unit have a standardized care plan for the late preterm infant involving some or all of these things?

Yes, we definitely have some of the standardized care elements you mentioned. We supplement our late preterm infants with formula if they are showing signs of poor breastfeeding. We do not use the pre- and post weights. They are used in the NICU though on the more unstable late preterm babies. We send parents home with a feeding plan and lactation services support. Our feeding care plans include bottles after breastfeeding for late preterm infants, weekly weights post discharge until full term and feeding well, lactation follow up. We do not use feeding readiness scores.

Question #3: In my survey, several hospitals responded they haven't they haven't implemented standardized care because of physician resistance. I'm wondering if your unit has experienced physician resistance in term of practice change? Is there other resistance such as nursing staff, administration, facility restraints or parent satisfaction?

I wouldn't say there is physician resistance. They will modify order sets as we want, especially when we present evidence supported by the research. We have a good relationship with our PCPs and OBs and also support from the neonatologists from NICU. Besides the general order sets which are standardized, we do not have a special care plan for the late preterm infants. We will individualize care to the needs of the baby or mother. We get some nursing resistance. No facility constraints as we have a very large unit and can handle bed and boarding in. The parents and administration are non-factors. There aren't any barriers because the physicians and staff are in agreement in how to care for the late preterm babies.

Question #4: Nationally, we know that initially the late preterm baby does well most of the time in the first few days of life, then often cannot sustain with as many as 20 % getting re-admitted within two weeks of birth. Are you aware of any post discharge complications for LPI?

Yes, there are re-admits and they always go to our pediatric unit. We don't admit on our unit. And the NICU doesn't like to take outside admissions. The late preterm infants are mainly readmitted for dehydration and phototherapy. Once in a while a respiratory issue or a septic workup. Forty percent sounds high though. If I were to guess, I would say less than 20%. I do not have the data, but I am pretty sure the PCPs have the data.

Question #5: Do you think your clientele would be opposed to extended length of stay in the nursery for their late preterm or increased follow-up post discharge?

Clientele would not be opposed to either. Administration might be opposed to it if it is a cost or staffing issue. I'm not positive on the reimbursement for keeping a baby longer than the mother. It might not be great. Physicians are usually easy to talk into letting a bay stay longer is need be. Some will discharge despite what we say and put in a quicker follow-up. PCP will agree to more follow up, especially a weight check. Home care visits are limited unless there is a problem such as bilirubin or poor latch/feedings. Parents are usually grateful when a baby needs to be transferred to NICU, but we are lucky to have a level III in our facility.

Interview C: Interviewee is a charge nurse of a post partum, level I nursery unit. She has been employed at that facility for 4 years and has been in her role for 3 years. She has a

bachelor's degree. The hospital also has a level 2-2 1/2 nursery on another floor. The hospital is in an outer ring suburb of a large metropolitan area. The demographic it serves is mostly suburban and some rural patients. Pediatricians write orders for care.

Question #1: Are the late preterm infants treated differently in your unit than the full term infants? If so, how are they cared for differently from the full term infants?

Yes. It has changed in the last 3 weeks. We are now taking 35 weekers and older. All the staff was sent to a newborn transition class to learn how to care for the late preterm infant. The babies receive vital every 4-hour, initial blood sugar and two follow-up blood sugars, initial pulse oximetry, and a car seat test. They are treated more alike than differently. They stay with their mother's in the rooms, are placed in a bassinet with the same about of linens, receive the same amount of teaching.

Question #2: Standardized care for the late preterm infant involves feedings and use of feeding readiness scores and the pre- &post weights, discharge criteria, car seat testing, thermoregulation, primary care provider post discharge follow-up appointments and boarding in with the infant if baby needs a prolonged hospitalization. Does your unit have a standardized care plan for the late preterm infant involving some or all of these things?

We do not have a standardized feeding plan for the late preterm babies. We don't use the pre- and post breastfeeding weights, but they use them on any late preterm babies who end up in the level II nursery. No special discharge criteria. We do car seat testing on all babies born less than 37 weeks. The follow-up post discharge PCP appointments are the same regardless of the age of the baby. But they are not standardized. Most physicians see the babies within a couple

of days, but there are a few doctors who order the follow-up for within one week. The nursing staff is great and has a sixth sense about the preterm infants requiring extra care.

Question #3: In my survey, several hospitals responded they haven't they haven't implemented standardized care because of physician resistance. I'm wondering if your unit has experienced physician resistance in term of practice change? Is there other resistance such as nursing staff, administration, facility restraints or parent satisfaction?

Yes, I think so. We have a lot of pediatricians. Not everybody is on the same page. They all seem to do things a little differently. I think that is a barrier to really standardizing infant care for the preterm. I don't believe there are any other restraints. The staff usually doesn't give us a lot of push back. We do a lot of education when we make a practice change which helps get everybody on the same page. Administration looks at the bottom lines, which for our organization are money and patient satisfaction. Parents don't know any different and want the best care for their child so they are cooperative.

Question #4: Nationally, we know that initially the late preterm baby does well most of the time in the first few days of life, then often cannot sustain with as many as 20% getting re-admitted within two weeks of birth. Are you aware of any post discharge complications for LPI?

Some of our late preterm infants and full term infants get re-admitted for phototherapy and or dehydration within a week or so of discharge from our unit. It is probably a slightly higher percentage for the late preterm infant compared to the full term infant. I do not know the data

on that information. It would be interesting to know that information, I wonder if it is kept. I think it is just a much of a PCP issue post discharge than a discharging unit issue. If we need to keep a baby after discharge, we do not have room on our unit or a nursery nurse to assign to the baby. Our new practice as of a year ago is to transfer those babies to the pediatric unit for the remainder of their care. It is less cost to have them in peds than be transferred to the level II nursery.

Question #5: Do you think your clientele would be opposed to extended length of stay in the nursery for their late preterm or increased follow-up post discharge?

Most parents would not be opposed to their late preterm infant staying in the hospital past the mother's discharge because they want what is best for their baby. There are a few who would think the baby would do fine at home, but it is usually because of lack of education on preterm infants and with some education by the physician, they understand and cooperate. I do not think any of our parents would oppose increased follow-up. Whether of not they actually comply with the follow-up plan is another thing. I have not heard form our pediatric providers that it is a problem. Transferring the baby to a facility that has a level III nursery is another issue. This is harder for the parents. We transfer for unstable vented, preemies less than 30 weeks, cardiac problems and surgical candidates. We can certainly handle basic late preterm baby care and I believe we do a very good job with them.

Interview D: Interviewee is a nurse educator of a post partum, level I nursery and labor and delivery unit. She has been employed at the hospital for 6 years and in her present

position for 1 year. The hospital also has a small level II nursery. The hospital serves a mid-level town and surrounding rural communities. Pediatricians write orders for care.

Question #1: Are the late preterm infants treated differently in your unit than the full term infants? If so, how are they cared for differently from the full term infants?

Babies in the level I nursery are treated a like based on our order sets for the newborn admission. We take late preterm babies down to 36 weeks. Anything younger goes to Special Care. The exception is every 4-hour vitals and car seat testing on the LPIs. Some LPIs are of good size and don't need thermoregulation. We use infant warmers for an initial low temperature, but if the baby has a problem maintain, they go to the Special Care nursery for thermoregulation. Some are good feeders, some aren't. You can't predict. We deal with whatever issues they have. We do not do a one size fits all type of care. Our pediatricians have said they don't want to be forced to do cookie cutter medicine, but rather individualize care to the needs of the patient. Any unstable baby automatically goes to Special Care and that unit has a more standardized approach to care. Most are mature enough to be treated like a full term infant.

Question #2: Standardized care for the late preterm infant involves feedings and use of feeding readiness scores and the pre- &post weights, discharge criteria, car seat testing, thermoregulation, primary care provider post discharge follow-up appointments and boarding in with the infant if baby needs a prolonged hospitalization. Does your unit have a standardized care plan for the late preterm infant involving some or all of these things?

We have standardized some of the things you mentioned. Car seat testing, the PCP follow-up appointment is standardized for the late preterm babies. The feedings, thermoregulation and

discharge criteria are not standardized, but we have order sets that help direct the care. We don't use breastfeeding pre and post weights. It is difficult because not all the late preterm infants are alike. Some are unstable, some are very mature and of course there are many in-between. Each baby needs to be assessed for how they are doing and the appropriate care can then be given. Some if it has to be individualized to accommodate for the differences.

Question #3: In my survey, several hospitals responded they haven't they haven't implemented standardized care because of physician resistance. I'm wondering if your unit has experienced physician resistance in term of practice change? Is there other resistance such as nursing staff, administration, facility restraints or parent satisfaction?

Yes, there is some physician resistance to standardizing care. Probably mostly with discharge criteria and follow-up appointments. But a lot of the nursing staff is resistant to change as well. Despite emails, newsletters, and various forms of staff education and reminders, we see quite a bit of resistance. Older, more seasoned staff do what they think is best and would resist attempts to standardize things, especially feedings.

Question #4: Nationally, we know that initially the late preterm baby does well most of the time in the first few days of life, then often cannot sustain with as many as 20% getting re-admitted within two weeks of birth. Are you aware of any post discharge complications for LPI?

I am aware that some preterm babies get re-admitted into our pediatric unit and some end up in urgent care or ER for issues such as hyperbilirubenia, dehydration, breastfeeding complications and maybe some septic work-ups, more so in the winter months. Wow, 30-40%? That is high. Maybe the primary care providers need a standardized plan of care to the late preterm infants

Question #5: Do you think your clientele would be opposed to extended length of stay in the nursery for their late preterm or increased follow-up post discharge?

Absolutely not! The parents would be supportive of anything we felt the baby needed, including extended stays past mom's discharge or a transfer to the NICU. That decision is nurse initiated, but physician driven. Parents trust their pediatrician and will go along with what he or she says.

Interview #5: Interviewee is a unit manager for post partum, level I & II nurseries, and labor and delivery. She has been employed at that facility for 2 years and in her current position for 2 years. She has her master's degree. The hospital is serving in an outer ring suburban area of a metropolitan area. Physicians write orders for care with the special Care nursery in which both physicians and neonatal nurse practitioners write orders.

Question #1: Are the late preterm infants treated differently in your unit than the full term infants? If so, how are they cared for differently from the full term infants?

We take temperatures on our all babies less than 37 weeks gestation. Our level I nursery will admit a stable late preterm baby 35 weeks and older. The get an initial blood sugar and if it is less than 60, they will get two more. If it is 60 or higher, they do not get another blood sugar. We make sure a late preterm baby does not go longer than 4 hours between feedings. We encourage the mother's to supplement formula is the baby is sleepy or does not have a successful breastfeeding. Some of the lactation consultants do not advocate for any supplemental bottle feedings and tend to treat the late preterm infants as a full term infant. We do not have any type

of standardized feeding plan for any of the babies admitted to the level one nursery. They probably do in the level II nursery. I know pre and post weights are done in the level II nursery, but not in the level one. We think that the weights make the mother's anxious.

Question #2: Standardized care for the late preterm infant involves feedings and use of feeding readiness scores and the pre- &post weights, discharge criteria, car seat testing, thermoregulation, primary care provider post discharge follow-up appointments and boarding in with the infant if baby needs a prolonged hospitalization. Does your unit have a standardized care plan for the late preterm infant involving some or all of these things?

I already referred to standardized feedings in the previous question. We do not use a standardized discharge criteria. If the baby is stable and eating, they go home with follow-up. If they are not stable or not feeding well, they get transferred to the Special Care nursery for a prolonged hospital stay and more knowledgeable nurses, but not really standardized in that nursery, either. We do car seat testing on babies born less than 37 weeks whether they are admitted into the level I or level II nursery. Lactation sees any mother who is having trouble, but no specific or different lactation plan for a mother of a late preterm infant.

Question #3: In my survey, several hospitals responded they haven't they haven't implemented standardized care because of physician resistance. I'm wondering if your unit has experienced physician resistance in term of practice change? Is there other resistance such as nursing staff, administration, facility restraints or parent satisfaction?

All of the above. There is some physician and NNP (neonatal nurse practitioner) resistance, especially in the level II nursery. Whether level I or II, each practitioner likes to do thing their own way and have some strong opinions. There is also a lot of nursing staff resistance. Man of the nurses have been here a long time and have developed their own practice in their nursing care. There is administration resistance as the length of stay can be costly to the hospital. There are also facility restraints as our unit is on the small side. There are not extra rooms for "bed and boarding" parents when the preterm baby has to stay longer than the mother. It is a problem when we are full with post partum patients. We sometime will allow a mother to stay on the pediatric unit if their census allows it. In a way, there is parent resistance. We have had a lot of parents who do not want their babies transferred to our special care and have a prolonged hospital stay. We have also see a lot of parents get upset if the baby had to get transferred to another higher level facility. Parents have complained that want the baby to be cared for at their delivering hospital. I know that our health system is looking at different solutions.

Question #4: Nationally, we know that initially the late preterm baby does well most of the time in the first few days of life, then often cannot sustain with as many as 20% getting re-admitted within two weeks of birth. Are you aware of any post discharge complications for LPI?

Really, I am unaware of how many late preterm infants get re-admitted. Very few end up in our hospital's pediatric unit, and I would guess that many go to a Children's hospital. We don't take any back on our unit. Occasionally the Special Care unit will take one back, but they don't like outside admissions.

Question #5: Do you think your clientele would be opposed to extended length of stay in the nursery for their late preterm or increased follow-up post discharge?

I think that some of our parents would be opposed to an increased length of stay, but probably not to increased follow-up. Typically, we do not write a lot of follow-up referrals for homecare unless there are big concerns, mostly social. We offer lactation services for 3 appointments after discharge for the next year. Most discharge patients do not take advantage of their services. The pediatrician handles the post discharge problems including many feedings issues, with the late preterm infants.