2006

Nurses' opinions of speech pathologists working in neonatal intensive care units

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DOI: <https://doi.org/10.31979/etd.k6k4-27bc>
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**NURSES' OPINIONS OF SPEECH PATHOLOGISTS WORKING
IN NEONATAL INTENSIVE CARE UNITS**

A Thesis

Presented to

The Faculty of the Department of Communicative Disorders and Sciences

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

By

Lisa Ann Medina

May 2006

UMI Number: 1436935

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ABSTRACT
NURSES' OPINIONS OF SPEECH PATHOLOGISTS WORKING
IN NEONATAL INTENSIVE CARE UNITS

by Lisa A. Medina

The role of the speech-language pathologist (SLP) has expanded to include working in the neonatal intensive care unit (NICU) addressing feeding and swallowing issues of premature infants. An eight item questionnaire was distributed to NICU nurses to determine prevailing opinions concerning speech-language pathologists working in the NICU setting. One hundred and forty NICU nurses from 15 Northern California hospitals volunteered to participate by completing the questionnaire. The results revealed that the majority of the NICU nurses were unfamiliar with the role of the SLP in the NICU setting and most had not had opportunities to collaborate concerning feeding and swallowing of premature infants. The majority of NICU nurses were supportive of sharing responsibilities for patient care, and allowing the SLP to counsel parents and coordinate follow-up care for premature infants after discharge from the NICU provided the SLP received specialized training.

Acknowledgements

I would like to dedicate this thesis to my husband, William Medina, for enduring hours of my study time and helping raise our three wonderful children while I attended school. I would also like to thank my parents, Daniel and Irene Tupper, for their never ending support. I also thank my twin sister, Laura Lee Pier, for her constant love and encouragement. A special thanks to all the neonatal nurses who elected to participate in the study since their responses form the foundation for this thesis. Lastly, I would like to thank God for the strength to accomplish my educational goals.

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Introduction

The purpose of this study is to contrast the roles and responsibilities that are recommended by the American Speech-Language-Hearing Association (ASHA) and speech-language pathologists working actively in the neonatal intensive care unit (NICU) with the neonatal intensive care (NICU) nurses' perceptions and acceptance of the speech-language pathologist (SLP) in this specialized setting. How familiar are NICU nurses and other hospital personnel of the speech-language pathologist's expanded role in the NICU? How accepting are NICU nurses in including SLPs in patient care for premature infants? These are some of the pertinent questions which will be addressed in this thesis. It would be advantageous to the patients for NICU nurses to understand how the SLP can be an asset to the NICU medical team and what can be done by the SLP to help with the smooth transition into discharge planning and early intervention.

The hypotheses for this study were:

- ❑ Neonatal intensive care nurses are unfamiliar with the role of the speech-language pathologist in the neonatal intensive care unit when the SLP is not employed to work in that setting.
- ❑ Neonatal intensive care nurses state that speech-language pathologists should be team members in the NICU.
- ❑ Neonatal intensive care nurses are hesitant to collaborate with SLPs in sharing patient care and parent counseling.

An eight-item questionnaire was developed to determine the acceptance of certain roles adopted by the speech-language pathologist for which the NICU nurses and others on the NICU team would need to adjust to and collaborate with when the SLP is employed in the NICU setting. The questionnaire and consent form to participate in the study are included in Appendices A and B.

A sampling of 15 hospitals was used to achieve a representative viewpoint of NICU nurses from smaller to larger hospitals in varying regions in the San Francisco Bay Area and Central Valley region of California. The data was then interpreted as a whole as well as by each hospital individually.

As a preview to more quickly identify the roles and responsibilities for the speech-language pathologist working in the NICU setting, an outline was developed. The American Speech-Language-Hearing Association's ad hoc committee (2005) established these guidelines. These roles and responsibilities include:

1. Communication evaluations and interventions in context with developmentally supportive and family-focused care.
2. Feeding and swallowing evaluations and intervention including:
 - a. Pre-feeding assessment and promotion of readiness for oral feeding,
 - b. Evaluation of breast and bottle-feeding ability,
 - c. Completion of instrumental swallowing evaluations.
3. Parent/caregiver education and counseling.
4. Staff (team) education and collaboration, that includes information regarding:
 - a. Developmental expectations,

- b. Communication interaction patterns,
 - c. Feeding and swallowing behaviors.
5. Quality control and risk management (which is not emphasized in this thesis).
 6. Discharge/transition planning and follow-up care.
 7. Professional education and supervision.
 8. Public education.
 9. Advocacy.
 10. Research.

These roles and responsibilities are addressed further in the literature review to greater understand the NICU nurses' responses to the questionnaire, and to delineate what specifically the SLP does for assessments and routine treatment of infants in this specialized setting. Many NICU nurses may not understand the SLP's role in this setting nor would speech-language pathology students unless instructed. Since there are few SLPs working in this setting, many of these roles and responsibilities are completed by the NICU nurses, occupational therapists, or physical therapists.

As a profession, it may be necessary to educate the NICU nurses and hospital administration of the importance of the role as speech-language pathologists in the NICU since they stated that SLPs may be duplicating services provided by other team members working in the NICU.

Literature Review

“Of all the medical and allied health care professionals, SLPs [speech-language pathologists] are best trained to understand the intricacies of infant oral anatomy and swallowing function.” (Fletcher & Ash, 2005, p. 8)

Wilson, Corbin, Usher-Aston and Mullis (2002) stated that the role of the NICU SLP is to screen for oral-motor and swallowing function. The American Speech-Language-Hearing Association: ad hoc committee (2004) described the SLP's role more clearly. The SLP develops a standard pediatric clinical examination that includes a history, a physical examination and a developmental assessment. The SLP conducts instrumental evaluations to assess feeding and swallowing problems which include choosing appropriate testing resources and instrumental techniques, performing instrumental techniques and interpretation, and documenting and communicating these findings to make recommendations for the family, caregivers, and other members of the NICU team.

Communication Evaluation and Treatment

Developmental Assessment and Clinical Observations

The American Speech-Language-Hearing Association: ad hoc committee (2004) emphasized the importance of the SLP having a general knowledge base of normal embryology and infant development before and after birth including understanding infant behavior in reference to research in neurobiology, physiology, and genetics. The SLP must also be familiar with atypical infant development which includes etiologies, medical conditions, and risk factors.

The American Speech-Language-Hearing Association: ad hoc committee (2005) emphasized that children who are born prematurely and have a low birth weight have an increased risk for language and communication problems. These children might be severely affected in the linguistic areas of auditory discrimination, imitation of oral positioning of the articulators, and imitation of sentences. They might also have visual and auditory deficits, lower intelligence quotient (IQ), language and reading difficulties, academic underachievement, and behavioral issues such as hyperactivity and internalizing disorders. Jones, Morgan, Shelton, and McMurray (2002) noted that speech and language delays were prevalent in children with a history of feeding problems because the same muscles used for feeding are also used for speech.

The communication evaluation and intervention included giving developmentally appropriate assessments of pre-linguistic and socio-communicative interactions and neurodevelopmental assessments. The SLP's first step for a developmental assessment of premature infants is to review charted medical history and prior evaluations so that this knowledge can be compared to current clinical observations. This enables the SLP to identify performance patterns and potential disorders based on developmental expectations for the premature infant. The communication evaluation is conducted for the purpose of establishing early treatment and sending timely referrals to other health professionals when disorders affecting communication were identified (The American Speech-Language-Hearing Association: ad hoc committee, 2005).

Jones and McMurray (2001) recommended that high risk infants be assessed by multidisciplinary health professionals four or five times during the first year to determine

their neurologic, sensory, developmental, and behavioral status, identify any potential problems and refer for remedial care. They stressed the importance of correcting for the difference between chronological age and gestational age determined by taking the infant's chronological age and then subtracting the months or weeks that the infant was born early. The corrected gestational age is tracked for the first 18 months to 2 years of age.

Assessing infant behavior.

The American Speech-Language-Hearing Association: ad hoc committee(2004) stated that one of the responsibilities of the SLP would be to document the progress of the premature infant's readiness for feeding, establish feeding goals, and chart communicative interactions.

What is meant by "communicative interactions" since infants in the NICU do not talk? What specifically is being observed and documented that reveals the meaning behind infant behavior? Rickard, Cowen, and Ankenmann (2003) noted that the SLP observes premature infant behavior patterns to determine "prelinguistic intent" which they defined as the infant's attempts to communicate his or her needs.

Lemons and Loughhead (2001) stated that each infant gives to the care provider cues which signal a willingness to continue an activity (engagement cues) or to take a break from the activity (disengagement cues). "These observable changes in state, attention, posture, and movement always precede a change in the infant's physiologic status. Altering the timing and the pace of feeding in response to these behavioral cues promotes homeostasis [proper balance]." (p. 9)

The premature infant can give two types of behavioral cues: active stress cues and passive stress cues. Active stress cues are: gagging, choking, tachypnea (rapid breathing), gulping, emesis, facial grimacing, crying, thrusting, arching, pushing bottle away, turning hands out, and turning head away. Passive stress cues are: feeding-induced apnea, decelerations (drop in heart rate), bradycardia, oxygen desaturation, color change, flaccidity (limp, low muscle tone), eye rolling, diffuse sleep state, and fatigue (Rickard et al., 2003).

McGrath and Medoff-Cooper (2002) stated that the infant's behavioral state is an important variable in routine caregiving interventions in which the SLP would have a part. Alertness is critical for interacting with the environment and linked to cognitive learning and development. The premature infant's alertness often requires full-body involvement to achieve focused attention, quiet inactivity, and modulated tone. Premature infants go through periods of brief alertness interspersed with periods of non-alertness of non-predictable duration. As they mature, the infants are able to stay alert for longer periods of time. McCain (2003) explained that from 32 weeks gestational age to term age (40 weeks), the brain structure is maturing with improved motor organization and a more organized awake behavior, which are important milestones for oral feeding.

Developmental infant care.

Rickard et al. (2003) recommended that the SLP modify the environment of an infant less than 32 weeks gestation to make it similar to the womb. They also advised using deep, firm pressure and containment (head support and blanket support) when the infant is handled, monitoring the infant's physiological state (heart rate, respiration,

oxygen saturation, and skin color) carefully, responding to the infant's cues rather than giving care on a schedule for suctioning or diaper changes, and teaching the parents how to interact with the infant so they understand their infant's needs which fosters early bonding. These infant cues and possible interventions for the SLP to incorporate for patient care is provided in Appendix C.

Rickard et al. (2003) also encouraged the SLP to provide stimulation to the infant that is greater than 36 weeks gestation through eye contact and facial expression since the infant would be able to cope with stress better than infants with fewer weeks of gestation. Closing the infant's eyes to shut out the visual stimuli is recommended if another type of stimulus is used. The SLP can offer a finger for hand grasping during a feeding, and respond to the infant's care eliciting behaviors which develop trust. They also encouraged the SLP to communicate with the infant by establishing and maintaining joint gaze, talking to the infant, and imitating infant sounds and facial expressions.

Feeding and Swallowing Evaluation

Criteria for Feeding Readiness

To determine the infant's oral feeding stage, it is important to consider the infant's developmental level and adjust for premature birth (Jones et al., 2002). Pickler (2004) developed some criteria for bottle feeding readiness that would be useful for the SLP based on interrelated neurologic maturation, severity of illness, and pre-feeding autonomic, motor, and behavioral state organization that influence the infant's need to self-regulate.

Jones et al. (2002) further emphasized the importance of decreasing the stimuli around the premature infant so he or she would be in an appropriate state of alertness or readiness for feeding. “Be aware of each infant’s stress and avoidance cues/signals, such as agitation, gagging, finger splaying, and arching.” (p. 56) These are signs of over-stimulation which distract the infant’s alertness needed for feeding.

Dysphagia and Oral Aversion

The SLP must determine if the feeding problem is a motor issue or a sensory issue. If it is a motor problem, the infant could not use the tongue, lip, and jaw muscles to safely eat. If it is a sensory issue, the infant tends to show a negative reaction to textures, temperatures, and tastes, but he/she would be able to swallow safely (Wilson, et al., 2002).

The SLP is trained to assess difficulties with feeding that might indicate an underlying physiological problem with swallowing. Coughing and choking with feeding, respiratory compromise, apnea (temporary breath stoppage) and bradycardia (slow heart rate) during feedings are signs that the infant might have a feeding problem (Fletcher & Ash, 2005). Jones et al. (2002) explained that a feeding problem in an infant could be caused by dysphagia, oral aversion, behavior problems, or a combination of these three factors.

Neurological Assessment of Feeding

Daily and Ellison (2005) reported that the neurologic assessment reassured

clinicians and parents of the infant's neurologic integrity, identified the infants that need intervention services, and determined what type of intervention is needed for the infant in the NICU and at discharge.

The American Speech-Language-Hearing Association: ad hoc committee (2005) stipulated that the SLP make careful observations of non-nutritive and nutritive sucking and swallowing to ascertain if these motor patterns were developmentally and functionally appropriate. The SLP must consider the input from parents, nursing staff, and other medical team members to determine the infant's readiness for oral feedings. The SLP diagnoses the suck/swallow of the infant and determines if there are abnormal anatomy and physiology associated with the infant's feeding or swallow.

According to Pickler (2004), a healthy 36-37 week premature infant could achieve a suck-swallow-breath pattern ratio of 1:1:1 or 2:2:1. A less coordinated feeding pattern was indicated by more sucking and less breathing with a ratio of 2:1 to 4:1. These were important diagnostic factors for SLPs to consider when monitoring feeding progress.

The American Speech-Language-Hearing Association: ad hoc committee (2005) recommended the use of sucking scales to assess the developmental stages of sucking in premature infants since as infants' sucking skills mature, feeding performance improve. Thus, the sucking scales could facilitate the management of oral feeding for these premature infants.

Formal feeding assessment.

Assessing the infant's neurological status may detect brain injury before it is

detected by technology. The average assessment should take 16 minutes and is defined subjectively as normal, questionable, or abnormal. The assessment can be given to infants 23- 37 weeks of age (Jones & McMurray, 2001). Daily and Ellison (2005) suggested that a neurological test should be scheduled 1/2 hour to 1 hour before a scheduled feeding.

The American Speech-Language-Hearing Association: ad hoc committee (2005) suggested that the SLP administer the Systematic Assessment of the Infant at Breast (SAIB), the Preterm Infant Breastfeeding Behavior Scale (PIBBS) or the Breastfeeding Evaluation to assess observations of infant and mother breastfeeding. When the premature infant was bottle fed, either expressed (pumped) breastmilk or a special premature infant formula, the SLP used the Neonatal Oral Motor Assessment Scale (NOMAS) to describe the tongue and jaw movements during suckling behaviors to determine the infant's feeding pattern.

Hawdon, Beauregard, Slattery and Kennedy (2000) stated that the Neonatal Oral Motor Assessment Scale (NOMAS) is a popular assessment used by experienced SLPs to differentiate these feeding patterns. It identified three distinct feeding patterns of oral feeding ---normal, disorganized, or dysfunctional. It was recommended to administer the NOMAS when oral feeding is introduced at 6 months and 12 months post-conceptual age to track feeding patterns over a long term period.

Feeding Flow Sheets are helpful to document feeding observations for neurological/behavioral state, respiratory rate, heart rate, nipple type, form of nutrition, infant position, suck/swallow/breath coordination, support strategies, quantity of intake,

and duration changes over time. The SLP can use the Infant Feeding Evaluation to chart observations of health professionals caring for the premature infant, and include the infant's response to attempted interventions (The American Speech-Language-Hearing Association: ad hoc committee, 2005).

Formal instrumental assessment.

The premature infant might be referred for an instrumental swallowing study that is carried out by a radiologist and an SLP if the infant has difficulty coordinating their suck-swallow-breathe cycles while feeding or has gastrointestinal disorders such as reflux or necrotizing enterocolitis (Fletcher & Ash, 2005; Rickard et al., 2005). Wilson et al. (2002) suggested that the SLP should refer infants for a Modified Barium Swallow (MBS) if the infant exhibits the following problems: poor intake, coughing or choking, abnormal sucking patterns, poor growth, fussing during feedings, poor consecutive swallowing, regurgitation, avoidance, or poor respiratory condition.

The American Speech-Language-Hearing Association: ad hoc committee (2005) stressed that when a videofluoroscopic swallow study, an endoscopic assessment or an ultrasonography is necessary, the homeostasis and respiratory status of the infant, gestational age, positioning, bolus presentation and its viscosity, and swallow variability must be considered. They also recommended that the infants be examined only by instrumental assessment when they are physiologically stable, when clinical findings or history and aspects of swallowing physiology can not be determined by clinical observation, and when needed to guide management decisions.

Treatments to Develop Oral Feeding

The manner in which the premature infant is fed is also important to consider. The SLP can help with the transition from gavage (or tube feeding) to breast-feeding and/or bottle-feeding as soon as medically possible to facilitate an earlier discharge from NICU to the parent's home environment. The SLP can use infant behavioral cues, gestational age, and weight criteria to make feeding decisions (The American Speech-Language-Hearing Association: ad hoc committee, 2005).

Gavage to Oral Feeding

McCain (2003) noted that premature infants were ready to self-regulate feedings at 32 to 35 weeks PCA. She defined self-regulatory feedings as feeding the infant according to the infant's ability to tolerate the feedings without distress or fatigue and progressing or ending oral feeding sessions based on the infant's awake or restless behavioral cues.

Infants less than 32 weeks gestation should receive orogavage or nasal gavage [tube] feedings because of their increased risk of aspirating on milk during oral feedings due to decreased coordination of the suck/swallow/breathe pattern. The SLP must understand how much to feed the premature infant since feeding more than can be digested can lead to increased bacterial growth and the development of necrotizing enterocolitis (Anderson & Loughhead, 2002).

McGrath and Medoff-Cooper (2002) estimated that the transition from gavage to oral feeding takes 10-14 days, but it could take longer for sick or younger premature

infants. Then the focus of care shifts from keeping the infant alive to identifying and initiating normal feeding skills when the premature infant matures closer to 40 weeks gestational age. This requires the support and knowledge of a specialist such as an SLP to facilitate the transition from intubation and tube feeding to breastfeeding and bottle-feeding. Successful initiation of oral nipple feeding and nutritive sucking competence are the primary determinant for readiness to discharge from the NICU.

Rickard et al. (2003) provided an excellent overview of feeding guidelines for the SLP to use with the normal premature infant. They recommended clustering infant care activities, modifying the infant's environment as needed, arousing the infant gently, and watching feeding posture and swaddling. Wilson et al. (2002) also explained positioning concerns when feeding the infant, which considered the infant's head position, flexed and relaxed hips, and a straight back during feeding.

Rickard et al. (2003) recommended that the SLP start feeding intervention with non-nutritive sucking. Begin feeding with nipping, and develop a gradual steady progress in nipping for optimum feeding to prevent back-sliding of oral feeding ability.

The Breastfed Infant

The American Speech-Language-Hearing Association: ad hoc committee (2005) stressed the importance of the SLP having a basic understanding of the mechanics and physiology of breastfeeding and encouraged the collaboration with an international board-certified lactation consultant (IBCLC) when available. This collaboration between the SLP, IBCLC, and parents should continue after hospital discharge through home

visitation and early intervention services in the early months to determine when the infant is ready for spoon-feeding.

Speech-language pathologists must encourage mothers of premature infants to pump their breasts even when the infant is being tube fed, since the mother's breast milk is specially suited for her infant developmentally and can be frozen in storage until the infant is ready to use it (Fletcher & Ash, 2005). Evans and Thureen (2001) explained that breast milk is uniquely suited for the premature infant through increased bioavailability of its nutrients and immunologic properties, and the presence of hormones, enzymes, and growth factors. Preterm breastmilk also adapts to the needs of the premature infant by providing higher concentration of protein, sodium, and chloride, lower lactose, more calorie dense than does mature breastmilk. These differences between preterm and term breastmilk persisted until after the first month following birth.

The Bottle-fed Infant

Rickard et al. (2003) stated that a calm care provider calmed the infant. They recommended that the SLP should not interact with the infant during feeding to reduce environmental stimuli. They also suggested the SLP elicit a root reflex by stroking the infant from nose to mouth, select the bottle's nipple flow rate that is safe and efficient, determine when to stop feedings based on behavioral cues and physiologic signs, and note the suck/swallow/breathe pattern (the pattern of sucks and swallows per breath).

The SLP can find the bottle nipple that best suits the infant's sucking patterns by trying different bottle nipples and adjusting to the need of each individual premature

infant based on the observed infant's behavioral cues and physiological signs. Avoid the use of fast flow nipples since the flow of the feeding begins without an active suck and the infant may not be prepared to swallow causing aspiration (The American Speech-Language-Hearing Association: ad hoc committee, 2005).

Lemons and Loughhead (2001) stated that gulping, coughing, choking, upper airway congestion, and apnea are symptoms of poor airway management and signals the care provider (or SLP) to promptly interrupt feeding. Reducing the flow rate of milk delivery through the nipple actually resulted in more milk consumed per feeding than did infants who were offered a faster flow nipple. This indicated that infants did not have significant difficulty with swallowing and breathing with slower flow rate nipples.

Wilson et al. (2002) described swallowing compensations such as modifying the temperature and/thickness of the formula to use during feedings, and provided feeding care resources for the SLP to share with parents and caregivers. Jones et al. (2002) prescribed thickened feedings for infants who aspirate thin liquids or for infants with GERD and recommended the use of a special nipple that allows the infant to take in the thickened liquid.

Caregiver Counseling and Follow-up Care

The American Speech-Language-Hearing Association: ad hoc committee (2005) stated that the SLP contributed to the NICU team's developmental care plan with a focus on communication and feeding/swallowing issues. The SLP must help foster a supportive and nurturing environment in the NICU for the parents and for the health professionals caring for the premature infants.

Counseling and Parental Support

The American Speech-Language-Hearing Association: ad hoc committee (2005) explained that families often have limited opportunities or delayed access to interact with their infants in the NICU because of medical conditions, geographical locations, work patterns, and family obligations to spouse and other children. SLPs and other NICU team members work with the infant's family to provide parent education for feeding and care protocols and apply the principles of family-centered, and culturally appropriate care. SLPs inform parents regarding their infant's gestural and vocal communication patterns, and demonstrate developmentally supportive practices that support infant self-regulation and communication skills. They also assist in preparing families for the infant's discharge from the NICU.

The SLP identified the educational and counseling needs of the infant's families and caregivers and provided them with education, counseling, support and empowerment strategies. The importance of adapting the content and delivery of services given based on the family's cultural values was also emphasized (The American Speech-Language-Hearing Association: ad hoc committee, 2004).

Doering, Moser, and Dracup (2000) reported that the parents' needs were important to address. Parents need assistance in identifying and using supportive relationships and in finding ways in which to feel more control during their infant's hospitalization in the NICU. They reported that there were great differences in how parents respond to the NICU experience so the SLP should conduct a complete assessment of the infant's parents based on their individual needs and circumstances. The SLP that supports the

active search for information gives a high priority direct intervention for the parents that allows them a sense of control and reduced stress (Loo, Espinosa, Tyler, and Howard, 2003).

The SLP could educate the family about the monitoring devices used in the NICU and explain how and why they are used. When the premature infant is hooked up to the NICU's technological equipment, this can be frightening and overwhelming to parents (Rickard et al., 2003). Parents coped better with the stress of the NICU environment when they knew and understood more about their infant's condition and care.

Rickard et al. (2003) further explained that the parents may not be emotionally invested in the infant. The medical circumstances can affect the parent-infant relationship so much that the parents may be leery of forming a relationship with a medically fragile infant. They may not be ready for parenting yet because they are going through a grieving process of wishing circumstances were different and may have difficulty accepting the responsibility and commitments necessary in caring for a premature infant.

Health professionals such as SLPs can become supportive providers that model ways for parents to interact with their infant and to develop a relationship with them with confidence (VandenBerg, 2000).

Rickard et al. (2003) encouraged SLPs to establish parents as primary caregivers with only a few nurses as primary nurses. They encouraged frequent parental visits and rooming in, breastfeeding, kangaroo care for both parents, contingent care-giving appropriate to infant's behavioral responses, and consistent information communicated between caregivers and hospital team members.

Discharge Planning

The American Speech-Language-Hearing Association: ad hoc committee (2004) delineated that discharge, transition planning, and follow-up care are to be important roles for SLP in the NICU. The SLP identified discharge criteria, and the infant's and family's needs. The SLP participated in discharge planning and identified the appropriate follow-up care to meet the family's needs. Furthermore, the SLP documented the discharge criteria, discharge plan, and the follow-up care. Rickard et al. (2003) recommended that the SLP give careful instructions at discharge from the NICU, and that parents should be visited in the home to help the parents establish a home routine with their infant.

SLP's Collaboration with the NICU Team

The SLP's role when working with other health care professionals in the NICU setting is to become familiar with the team-based process involved in ethical decision making, understand the interactions, and respect differences within multiple disciplines. The SLP must know the staffing patterns and the parenting setup in the NICU. The SLP must become familiar with the foundations of developmental supportive care, the medical complications that might affect infants, as well as familiarity with the medical equipment and procedures used in the NICU (The American Speech-Language-Hearing Association: ad hoc committee, 2004).

Collaboration and Referral

The American Speech-Language-Hearing Association: ad hoc committee (2004) explained the collaboration process with other NICU team members. The SLP would

“identify the roles of all the health professionals on the NICU team, identify the need for additional assessments and consultations, initiate timely and pertinent referrals, use appropriate referral procedures, participate with other professionals in interpreting information and planning culturally appropriate interventions.” (p.163) The SLP must respect and acknowledge the professionals perspectives of all disciplines represented in the NICU team. A solution-focused approach is encouraged to resolve conflict and differences among the NICU team members.

Advocacy and Research

The American Speech-Language-Hearing Association: ad hoc committee (2004) encouraged SLPs working in the NICU to be active in training other SLPs and students in training in this role by identifying their educational and clinical needs and applying education techniques for optimum learning. In addition, it is important for the SLP to provide public education and advocacy for serving infants and families in the NICU, and to conduct research in this specialized setting to improve understanding of neonatal development and developing functional and effective treatments.

Method

Participants

The NICU nurses that participated in the study were randomly selected for the study and worked at Bay Area and Central Valley Hospitals which had neonatal intensive care units. The NICU nurses were selected based on their voluntary participation, and consent to complete a short 8 item questionnaire regarding their opinions of speech-language pathologists working in the NICU.

Design and Procedure

The purpose of this study was to discover the opinions of the NICU nurses regarding their openness to accept speech-language pathologists in this specialized setting as well as their awareness of the roles and responsibilities of speech-language pathologists that contribute to patient care in the NICU.

Six hundred questionnaires were distributed to NICU Nurses from 15 Bay Area and Central Valley hospitals in California that had a neonatal intensive care unit to determine how accepting these nurses are of SLPs in the NICU and how familiar the NICU nurses are of the SLP's roles and responsibilities within this specialty.

The questionnaires were left for a period of one to two weeks with approval and distributed by Neonatal Intensive Care Unit (NICU) Nurse Managers at participating hospitals so the nurses could complete the questionnaire at their convenience and be submitted by a specified date.

The questionnaire was constructed with 4 possible choices given and was generally rated 1 as a poor response to 4 being the most favorable response. However, the responses were specific to the question asked so interpretation of results could be evaluated subjectively for each question, rather than by rank.

The questionnaire contained the following items:

1. Are NICU nurses familiar with the role of the SLP in the NICU setting?
2. Have NICU nurses had opportunity to collaborate with a SLP on feeding or swallowing goals for the infants in their care?
3. Would the members of the NICU team be willing to include the SLP to facilitate and support feeding or swallowing goals for medically fragile infants at this hospital?
4. Provided the SLP has specialized training to work in the NICU, are NICU nurses willing to share some of the responsibility for assessing and treating premature infants?
5. Would the SLP be the appropriate person to educate and counsel the parents regarding feeding development, potential difficulties, and integrating physiologic and behavioral cues as infant communication?
6. Do NICU nurses think SLPs should do follow-up care for infants in the NICU and those infants recently discharged from the NICU?
7. What is the NICU nurse's opinion regarding why more SLPs in California do not work in NICU settings?

8. Do NICU nurses have any reservations or concerns for SLPs working in this specialized setting provided that the SLPs have received training to work in the NICU?

The hypotheses were:

1. Neonatal intensive care nurses are unfamiliar with the role of the speech-language pathologist in the neonatal intensive care unit when the SLP is not employed to work in that setting.
2. Neonatal intensive care nurses ascertain that speech-language pathologists should be team members of the neonatal intensive care unit.
3. NICU nurses are hesitant to collaborate with SLPs in sharing patient care and parent counseling.

It was the goal of the investigation to determine the prevailing opinions and concerns of the neonatal nurses regarding the addition of the speech-language pathologist in the routine care of medically fragile infants in the NICU.

Results

Of the 600 questionnaires delivered to the NICU nurse managers for distribution, 141 questionnaires were completed. One questionnaire was discarded due to inaccurate completion. See Table 1 for the listing of participating hospitals and the number of participants at each site.

Table 1

Participating Hospitals

Children's Hospital of Central California	Madera	15
Dameron Hospital	Stockton	7
Doctor's Medical Center	Modesto	13
Dominican Hospital	Santa Cruz	11
El Camino Hospital	MountainView	8
Good Samaritan Hospital	San Jose	23
Kaiser Permanente Hospital	Santa Clara	16
Memorial Hospital	Modesto	6
Mercy Hospital	Merced	7
O'Connor Hospital	San Jose	4
Regional Hospital	San Jose	7
Santa Clara Valley Medical Center	San Jose	7
San Joaquin County General Hospital	French Camp/Stockton	8
Sequoia Hospital	Redwood City	3
Washington Hospital	Fremont	6

The questionnaire was scored in two ways: 1) all responses per question for all NICU nurses participating, and 2) all responses per question for NICU nurses for each individual hospital. This allowed for interpreting the data for all the nurses as a whole group as well as for individual distinctive patterns noted by hospital or region. The first analysis was performed by counting the total number of responses per choice and converting to percentages. The second analysis required a rating score (1 poor to 4 very supportive) for each response at each hospital and converted into averages to determine patterns in the nurses' responses per question. Some distinctions arose when evaluating the questionnaire's results for certain questions in this manner.

For ease of reading, each question will be stated individually then the choices given for each question. This will be followed by the NICU nurses' responses and an analysis for each question. A pie graph is also included for each question.

Question 1: *Are NICU nurses familiar with the role of the SLP in the NICU setting?* The choice of responses for the first question were: (1) not familiar, (2) somewhat familiar, (3) familiar, or (4) very familiar.

Ninety-four of 139 responses (68%) stated that they were not familiar with the role of the SLP working in this setting. Thirty-one of 139 (22%) were somewhat familiar, 8 of 139 (5%) were familiar, and 6 of 139 (4%) were very familiar with the SLP's role in the NICU. See Figure 1.

Figure 1. Familiarity with the role of SLP in the neonatal intensive care unit.

While most of the NICU nurses were not familiar with the role of the SLP in the NICU setting, responses varied by hospital. The NICU nurses at San Joaquin General Hospital, and Dominican Hospital reported to be more familiar with working with SLPs. At Dominican hospital, 3 of 11 NICU nurses were very familiar, and 4 of 11 were somewhat familiar. At San Joaquin General Hospital, 1 of 8 NICU nurses were very familiar, 3 of 8 nurses were familiar, and 3 of 8 nurses were somewhat familiar.

Question 2: Have NICU nurses had opportunity to collaborate with a SLP on feeding or swallowing goals for the infants in their care? The choice of responses for the second question were: (1) not at all, (2) on one occasion, (3) frequently, or (4) regularly.

One hundred and four of 139 responses (75%) of the NICU nurses have not had opportunities to collaborate with a SLP on feeding or swallowing issues for infants. Twenty of 139 (14%) of the NICU nurses collaborated with the SLP on at least one occasion, 10 of 139 (7%) of the NICU nurses had collaborated with the SLP frequently, and 5 of 139 (3%) collaborate with the SLP regularly. See Figure 2.

Figure 2. NICU nurses' opportunity to collaborate with SLPs.

The NICU nurses at San Joaquin General, and Dominican Hospitals reported the most collaboration with SLPs on feeding and swallowing goals on at least on occasion. Three of 11 of the NICU nurses at Dominican hospital reported they collaborate with a SLP regularly, and 2 of 11 of the NICU nurses collaborated on one occasion. At San Joaquin General Hospital, the NICU nurses reported that 1 of 8 nurses collaborate

regularly, 2 of 8 nurses collaborate frequently, and 3 of 8 nurses had collaborated on one occasion.

Question 3: *Would the members of the NICU team be willing to include the SLP to facilitate and support feeding or swallowing goals for medically fragile infants at this hospital?* The choice of responses for the third question were: (1) not at all, (2) would consider, (3) would support, or (4) very supportive.

The responses to this question were distributed more evenly. Nine out of 139 (6%) of the NICU nurses reported that they did not want to include SLPs at all on the NICU team when treating medically fragile infants. Forty-nine of 139 (35%) of NICU nurses would consider it, 45 of 139 (32%) of NICU nurses would support it, and 32 of 139 (23%) of the NICU nurses would be very supportive. See Figure 3.

Figure 3. Willingness to include SLP on NICU team.

When evaluating the data using rank for responses from each hospital, with 1 being the less favorable response and 4 being the highest response, one-half of the hospitals would support having a SLP on the NICU team to support and facilitate feeding or swallowing goals. Listed are the seven hospitals with the highest means (with 4.0 being the highest average): O'Connor Hospital (3.5), Mercy Hospital (3.33), San Joaquin General Hospital (3.25), Dameron Hospital (3.25), Kaiser Santa Clara (3.06), Sequoia Hospital (3.0), and Dominican Hospital (2.9).

Question 4: *Provided the SLP has specialized training to work in the NICU, are NICU nurses willing to share some of the responsibility for assessing and treating premature infants?* The choice of responses for the fourth question were: (1) not at all, (2) with reservation, (3) in some capacity, or (4) full collaboration.

The highest number of responses with 65 of 140 responses (46%) was that the NICU nurses would be willing to share responsibilities with the SLP in some capacity. Fifty-seven of 140 (41%) of NICU nurses would fully collaborate with the SLP for assessing and treating premature infants and providing counseling and support for parents. Thirteen of 140 (9%) of NICU nurses have some reservation working with SLPs in the NICU even when the SLPs have received specialized training. Four of 140 (3%) of the NICU nurses reported that they did not want to share responsibilities at all with SLPs in the NICU. See Figure 4.

Figure 4. Willingness to share responsibilities with SLPs.

Question 5: *Would the SLP be the appropriate person to educate and counsel the parents regarding feeding development, potential difficulties, and integrating physiologic and behavioral cues as infant communication?* The choice of responses for the fifth question were: (1) not at all, (2) not certain, (3) supportive, or (4) very supportive.

The responses showed that the NICU nurses on this question were mostly positive. Fifty-six of 140 (40%) of the NICU nurses were supportive of the SLP's role as parent educator and planning discharge care, and 38 of 140 (27%) of the nurses were very supportive of SLPs in this role. Thirty-seven of 140 (26%) of the NICU nurses were not certain and 8 of 140 (6%) of the NICU nurses reported that SLPs should not be educating and counseling parents at all. See Figure 5.

Figure 5. SLP counseling parents of premature infants.

The eight hospitals with the highest means of NICU nurses who were supportive of SLP counseling and educating parents as well as doing follow-up care were: San Joaquin General Hospital (3.5), O' Connor Hospital (3.25), El Camino Hospital (3.25), Dominican Hospital (3.09), Good Samaritan Hospital (3.0), Doctor's Medical Center (3.0), and Washington Hospital (3.0), and Kaiser Santa Clara (2.94).

Question 6: *Do NICU nurses think SLPs should do follow-up care for infants in the NICU and those infants recently discharged from the NICU?* The choice of responses for the sixth question were: (1) not at all, (2) not certain, (3) supportive, or (4) very supportive.

The responses were very similar to the response to question five. The results showed that 6 of 139 (4%) of the NICU nurses did not want SLPs doing follow-up care with premature infants and 35 of 139 (25%) of the NICU nurses were uncertain. However, 61 of 139 (44%) of the NICU nurses would be supportive of SLPs doing follow-up care and 36 of 139 (26%) of the NICU nurses would be very supportive of SLPs in this role. See Figure 6.

Figure 6. Follow-up care for discharged infants provided by SLPs.

The hospitals with the highest means of NICU nurses who think SLPs should do the follow-up care for infants recently discharged from the NICU were O'Connor Hospital (3.25), Dominican Hospital (3.18), San Joaquin General Hospital (3.13), Doctor's Medical Center (3.08), Memorial Hospital (3.0), Kaiser Santa Clara (3.0), and Good Samaritan Hospital (2.91).

Question 7: *What is the NICU nurse's opinion regarding why more SLPs in California do not work in NICU settings?* The choices of responses for the seventh question were: (1) not accepted, (2) not trained, (3) no opportunity, and (4) not interested.

This question is an indirect question since most SLPs don't work in the NICU setting. It was intended to determine the NICU nurses' opinion regarding why more SLPs do not work in this setting.

Their responses were insightful. Twenty-two of 140 (16%) NICU nurses reported that SLPs would not be accepted to work in this specialized setting. Forty-nine of 140 (35%) NICU nurses stated that the SLPs were not working on the NICU because they are not trained adequately. Sixty-one of 140 (44%) NICU nurses said that SLPs were not working in the NICU due to lack of opportunity, and 2 of 139 (1%) suggested that the SLPs were just not interested. Several nurses chose more than one response for this question. See Figure 7.

Figure 7. Why most SLPs do not work in NICU.

Question 8: *Do NICU nurses have any reservations or concerns for SLPs working in this specialized setting provided that the SLPs have received training to work in the NICU?* The choice of responses for the last question were: (1) discourage it, (2) cautious, (3) some reservation, or (4) no concerns if trained.

The NICU nurses were encouraged to explain any concerns on the back of the questionnaire. Most of the nurses did not to write comments, but those who did gave tremendous insight to underscore their reasons for concern. These comments will be shared later in the discussion section.

Eighty-two of the 139 (59%) of the NICU nurses had no concerns as long as SLPs were trained to work in the NICU. Thirty-six of the 139 (26%) of the nurses had some reservation while another 16 of the 139 (12%) were cautious about allowing SLP to work

in NICU. Four of the 139 (2%) of the nurses reported that they would discourage SLPs from working in the NICU setting. See Figure 8.

Figure 8. Concerns about SLPs working in NICU setting.

The hospitals with the highest means from NICU nurses who had no concerns if the SLP has specialized training were Sequoia Hospital (4.0), Doctor's Medical Center (3.9), El Camino Hospital (3.75), San Joaquin General Hospital (3.75), Good Samaritan Hospital (3.64), and Dameron Hospital (3.58).

Discussion

Upon review of the research questions and the results of the study, it is now possible to address whether the hypotheses were rejected or not rejected.. The first hypothesis stated that NICU nurses in facilities in which SLPs are not employed in the NICU tend to be unfamiliar with the role of the SLP in this setting. The first hypothesis was not rejected since the results of the study revealed that not only are NICU nurses for the most part unfamiliar with the role of the SLP in the NICU, they also have limited opportunity to collaborate with them in the northern California hospitals which were surveyed.

The NICU nurses revealed some interesting reasons why some NICU nurses have reservations about SLPs working in the NICU as well as why more are not employed in these units. At nearly all the hospitals, the NICU nurses revealed that occupational therapists and/or specially trained physical therapists are currently conducting feeding assessments and treatment for premature infants. They indicated that the role of the SLP would be redundant to these other health professionals.

Another issue raised by concerned nurses was cost. If the service can be provided by existing personnel, administration is not likely to hire SLPs to work exclusively in the NICU. Some nurses questioned whether the health insurance companies would reimburse for services given by a SLP in this specialized setting. Although these concerns were addressed by the minority, they are valid.

The second hypothesis was that the NICU nurses state that the speech-language pathologist should be part of the NICU team. This hypothesis also was not rejected since

the majority of the nurses stated that they would be supportive of the SLP as part of the NICU team as long as the SLP has specialized training for working in the NICU.

There were several comments generated by concerned nurses regarding the adequacy of training to work in the NICU. One factor mentioned was the uniqueness of each NICU setting and whether it was a level II or level III care nursery. Other factors mentioned were about the SLP's scope of practice working in this setting, and privacy and security of patients.

There appears to be doubts concerning the extent of the SLP's training. One nurse said, "The SLP would also have to be an RN [registered nurse] with NICU experience to care for babies." Another nurse stated that a significant amount of time is needed to evaluate and treat premature infants and stressed that training needs to contain a significant amount of hands-on experience with a NICU nurse and not just theoretical training.

Since extensive training is not readily available to speech-language pathologists in their formal training at the academic level even when the American Speech-Language and Hearing Association theoretically delineates the roles and responsibilities for speech pathologists who choose to work in this setting, it stands to reason that extensive hands-on training needs to be made available. If it is available, it needs to be advertised and promoted in the speech-language pathology profession as well as in the NICU community to foster greater awareness of such opportunities.

The third hypothesis was that NICU nurses are hesitant to collaborate with SLPs in sharing patient care and parent counseling. The results of the study reveal that the

majority of NICU nurses would accept and support SLPs as part of the NICU team provided they have specialized training. The third hypothesis was rejected because the majority of the nurses reported that they would accept the expertise of the SLP, and support sharing patient care and parent counseling.

Many of the nurses, however, would prefer that the SLP focus on assessment and remediation after the infant has been discharged from the NICU and needs follow-up care. Other nurses stated that fewer people working with the infants is preferred to reduce over-stimulation of the premature infants. Another nurse was concerned that the SLP would give conflicting counsel to the parents and cause more confusion than assistance. Yet another nurse stated that the SLP is more greatly needed post-NICU discharge and that SLPs need to “get the word out to the public and pediatricians about speech and language delay in infants and toddlers.”

Every study has its limitations. This study could have been improved by doing an extensive search and only including hospitals that employ SLPs to work exclusively in the NICU. The research questions could then be more specific such as: (1) discovering how they actually collaborate with the NICU team, (2) determining which responsibilities are relegated to the SLP as routine care for the infant, and (3) what level of involvement is the SLP in parental education and counseling, as well as discharge planning and follow-up care and early intervention services is provided by the SLP in those hospitals.

Summary

This study was conducted to determine NICU nurses' perceptions of the roles and responsibilities of the SLP working in the NICU since speech-language pathologists would be working closely with these nurses for optimum patient care. Of the roles and responsibilities stipulated by the American Speech-Language-Hearing Association, it would be interesting to discover how the NICU nurses would respond to sharing some of these responsibilities for which they routinely provide in patient care as well as the awareness of how the SLP can assist them.

An eight item questionnaire was distributed to NICU nurses at 15 northern California hospitals with 140 NICU nurses participating in the study. The nurses' responses were interpreted by gathering the data as a whole group as well as each specific hospital.

The results of the study suggest that the NICU nurses would accept the expertise of the SLP as part of the NICU team. However, the lack of awareness of how speech pathologists would benefit the NICU as well as the limited number of SLPs hired to work in this setting, suggest that occupational therapists, physical therapists, and of course NICU nurses will continue to fulfill the roles and responsibilities stipulated by ASHA that can be accomplished by extensively trained SLPs who enjoy working with this population.

The role of the SLP continues to broaden requiring greater education in a widening scope of practice encompassing general speech and language difficulties as well as many specialties including feeding and swallowing assessment and treatment for infants, children, and adults with neurological deficits. Early assessment and treatment for

patients of all ages will improve their quality of life and may prevent or alleviate feeding, swallowing, and even speech or language problems.

Convincing hospital administrations, health insurance companies, and/or the NICU team that the services of a SLP are an asset and that well-managed care is actually less costly due to reduced hospital stays may take time. Since few SLPs venture into this specialty, it is likely that only progressive hospitals and well-informed communities will incorporate the speech-language pathologist in the NICU setting exclusively. There still exists a lack of awareness of what a SLP does outside the classroom to improve the quality of life for people of all ages and the variety of medical conditions the speech pathologist can assess and treat.

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Appendix A

Questionnaire for NICU Nurses Regarding Working with Speech Language Pathologists in the NICU

Please rate responses from 1 to 4 with 4 being the highest rating and 1 being the lowest.

1. How familiar are you with the role of the speech-language pathologist (SLP) in the NICU setting?
(1) **not familiar** (2) **somewhat familiar** (3) **familiar** (4) **very familiar**

2. Have you had opportunity to collaborate with a SLP on feeding or swallowing goals for the infants in your care?
(1) **not at all** (2) **on one occasion** (3) **frequently** (4) **regularly**

3. In your hospital, would the members of the team be willing to include the SLP to facilitate and support feeding or swallowing goals for medically fragile infants?
(1) **not at all** (2) **would consider** (3) **would support** (4) **very supportive**

4. Provided the SLP has specialized training to work in the NICU, would you be willing to share some of the responsibility for assessing and treating premature infants in pre-feeding skills, referring and interpreting instrumental swallowing studies, recognizing physiological and behavioral signs, progressing goals for gavage feeding to oral feeding and providing parent counseling and support?
(1) **not at all** (2) **with reservation** (3) **in some capacity** (4) **full collaboration**

5. Do you think that the SLP would be an appropriate person to educate and counsel the parents regarding feeding development, potential difficulties, and reading physiologic and behavioral cues as infant communication, and do follow-up with the infants under your care, and those recently discharged from the NICU?
(1) **not at all** (2) **not certain** (3) **supportive** (4) **very supportive**

6. Do you think SLP should do follow-up care for infants under your care or those recently discharged from the NICU?
(1) **not at all** (2) **not certain** (3) **supportive** (4) **very supportive**

7. In your opinion, why do you think most SLPs in California do not work in NICU settings?
(1) **not accepted** (2) **not trained** (3) **no opportunity** (4) **not interested**

8. Do you have any reservations or concerns for SLPs working in this specialized setting provided they have received training to work in the NICU? If so, explain on the back side of the questionnaire.
(1) **discourage it** (2) **cautious** (3) **some reservation** (4) **no concerns if trained**

Thank you for completing this questionnaire.

Subject initial_____

Appendix B

Agreement to Participate in Research

Responsible Investigator: Lisa Medina

Title of Protocol: Questionnaire for NICU Nurses Regarding SLPs in NICU

1. You have been asked to participate in a research study investigating the perspective of neonatal nurses in the Neonatal Intensive Care Unit regarding their opinions of a speech-language pathologist working with them in this specialized setting.
 2. You will be asked to fill out an questionnaire during a prearranged time at the hospital in which you are employed.
 3. There are no risks or discomfort anticipated for the subjects participating in the study.
 4. There are no discernible benefits expected for subjects participating except for a possible indirect benefit of a general feeling of reward from being of help to research.
 5. Although the results may be published, no information that could identify you will be included.
 6. There is no compensation for participation in this study.
 7. Questions about this research may be addressed to Lisa Medina, (209) 862-4590. Complaints about the research may be presented to Gloria Weddington, Department Chair, Dept. of Communicative Disorders and Sciences (408) 924-3688. Questions about research subjects' rights, or research- related injury may be presented to Pamela Stacks, Ph.D., Interim Associate Vice President, Graduate Studies and Research, at (408) 924-7029.
 8. No service of any kind, to which you are otherwise entitled, will be lost or jeopardized if you choose to "not participate" in the study.
 9. Your consent is being given voluntarily. You may refuse to participate in the entire study or in any part of the study. If you decide to participate in the study, you are free to withdraw at any time without negative effect on your relations with San Jose State University or with any other participating institutions.
 10. At the time you sign this consent form, you will receive a copy of it for your records, signed and dated by the investigator.
- **The signature of a subject on this document indicates agreement to participate in the study.**
 - **The signature of a researcher on this document indicates agreement to include the above named subject in the research and attestation that the subject has been fully informed of his or her rights.**

Signature

Date

Investigator's Signature

Date

Appendix C

Interventions Based On Infant Behavior

Infant's Behavior	Parent's Observation	Intervention
Squirming Straining Grunting Turning Away Red Face, bug eyes Arching Pulling off nipple Gagging	Baby needs to burp, Pass gas or poop! Reflux (GER)	Burp baby Wait, then resume feeding
Head bobbers	Reaction to normal apnea	Allow less sucks per burst. Decrease milk flow
Multiple swallows/chin movements Blinking/eye rolling Backing up Apnea Decelerations/bradycardia	Difficulty with bolus control	Pacing (giving a breathing break) a. tip nipple up b. tip baby up c. pat shoulder or head gently
Sleepy	Shutting down Feeling full All done!	Burp Increase flow initially Nipple traction Change diaper Oral stimulation Stop feeding
Tongue pops	Flaccid tongue Hypertonic posterior tongue	Palate placement of nipple to ensure proper suction (roof of mouth) Nipple traction Tongue base support
Apnea Bradycardia Desaturation	Immature airway defense reflex Laryngospasm	Vigorous stimulation to expel penetrated fluid Give blowby O2 prn
Gagging Thrusting Large Excursions	Oral aversion	Quiet presentation Palate placement
Diffuse sleep state Hypotonia Fingersplay/salute Gaze aversion/irritability	Overstimulated	Swaddle Cradle Firm, deep touch Environmental modifications Firm nipple contact

Created from the handout by Rickard, Cowan, and Ankenmann (2003)