Bright beginnings : quick tips for occupational therapists in the level II nursery

Lindsey Bartholomew  
*University of North Dakota*

Lacey Gramstad  
*University of North Dakota*

Follow this and additional works at: [http://commons.und.edu/ot-grad](http://commons.und.edu/ot-grad)

Part of the [Occupational Therapy Commons](http://commons.und.edu/ot-grad)

**Recommended Citation**  
[http://commons.und.edu/ot-grad/168](http://commons.und.edu/ot-grad/168)
BRIGHT BEGINNINGS: QUICK TIPS FOR OCCUPATIONAL THERAPISTS IN THE LEVEL II NURSERY

by

Lindsey Bartholomew
Lacey Gramstad

Advisor: LaVonne Fox, Ph.D., OTR/L

A Scholarly Project
Submitted to the Occupational Therapy Department
of the
University of North Dakota
In partial fulfillment of the requirements
for the degree of
Master’s of Occupational Therapy

Grand Forks, North Dakota
May 2008
This Scholarly Project Paper, submitted by Lindsey Bartholomew and Lacey Gramstad in partial fulfillment of the requirement for the Degree of Master’s of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

Faculty Advisor

Date

April 28, 2008
PERMISSION

Title Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery

Department Occupational Therapy

Degree Master’s of Occupational Therapy

In presenting this Scholarly Project/Independent Study in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, we agree that the Department of Occupational Therapy shall make it freely available for inspection.

We further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised our work or, in her absence, by the Chairperson of the Department.

It is understood that any copying or publication or other use of this Scholarly Project/Independent Study or part thereof for financial gain shall not be allowed without our written permission. It is also understood that due recognition shall be given to us and the University of North Dakota in any scholarly use which may be made of any material in our Scholarly Project/Independent Study Report.

Signature Date 4/23/08

Signature Date 4/23/08
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>vi</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Terminology</td>
<td>3</td>
</tr>
<tr>
<td>II. REVIEW OF LITERATURE</td>
<td>6</td>
</tr>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>Infant’s Needs in the Level II Nursery</td>
<td>9</td>
</tr>
<tr>
<td>Medical Needs</td>
<td>10</td>
</tr>
<tr>
<td>Environment</td>
<td>10</td>
</tr>
<tr>
<td>Parent’s Needs</td>
<td>11</td>
</tr>
<tr>
<td>Role of Occupational Therapy</td>
<td>13</td>
</tr>
<tr>
<td>Educational Preparation</td>
<td>13</td>
</tr>
<tr>
<td>Evaluation</td>
<td>14</td>
</tr>
<tr>
<td>Treatment</td>
<td>14</td>
</tr>
<tr>
<td>Theories</td>
<td>15</td>
</tr>
<tr>
<td>Family Collaboration/Education</td>
<td>15</td>
</tr>
<tr>
<td>OT Educational Needs</td>
<td>15</td>
</tr>
<tr>
<td>Clinical Knowledge</td>
<td>15</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Interpersonal Knowledge</td>
<td>16</td>
</tr>
<tr>
<td>Cultural Competency</td>
<td>16</td>
</tr>
<tr>
<td>Proposed Program</td>
<td>16</td>
</tr>
<tr>
<td>Organizational Design</td>
<td>17</td>
</tr>
<tr>
<td>Theoretical Model</td>
<td>18</td>
</tr>
<tr>
<td>Summary</td>
<td>19</td>
</tr>
<tr>
<td>III. METHODOLOGY</td>
<td>20</td>
</tr>
<tr>
<td>IV. PRODUCT</td>
<td>22</td>
</tr>
<tr>
<td>Model</td>
<td>23</td>
</tr>
<tr>
<td>BRIGHT BEGINNINGS: QUICK TIPS FOR OCCUPATIONAL THERAPIST IN THE LEVEL II NURSERY</td>
<td>1</td>
</tr>
<tr>
<td>V. SUMMARY</td>
<td>25</td>
</tr>
<tr>
<td>Summary of Purpose</td>
<td>25</td>
</tr>
<tr>
<td>Brief Overview of Product</td>
<td>26</td>
</tr>
<tr>
<td>Limitations</td>
<td>27</td>
</tr>
<tr>
<td>Proposal for Implementation</td>
<td>27</td>
</tr>
<tr>
<td>Conclusion</td>
<td>27</td>
</tr>
<tr>
<td>Recommendations</td>
<td>28</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>29</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>32</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

The authors wish to express appreciation to their scholarly advisor: LaVonne Fox, Ph.D., OTR/L

Special thanks to Karli Joy Cool, for being our inspiration for this project
ABSTRACT

In 2004 there were 790 infants born prematurely in Wyoming (Freudenthal, 2006). Currently, the highest level of infant care available in Wyoming is a Level II nursery. In Wyoming, infants born prematurely with special medical needs are typically transported to specialized NICU’s in surrounding states. The limited contact that medical staff, including occupational therapists (OT’s), in rural facilities have with critically or moderately ill infants creates a lack of competency with the unique medical care needs of the infants. According to Gordon (2003) “nearly half of America’s babies start out their lives in a rural community” (p. 3). Furthermore, research indicates that the provision of care in rural areas is substandard to care in urban/suburban areas due to lack of adequate training and resources secondary to a lower population of infants born prematurely. Gordon (2003) also indicated that “such deficiencies in training have less impact in urban and suburban areas, which have seen a proliferation of level II units. Outcomes of infants born in suburban areas are superior to those of neonates born in rural locations” (p 3).

Research supported a need for a resource guide for OT’s who provide care to infants born prematurely in Level II nurseries in rural areas.

The development of the resource guide is based on an extensive literature review; guided visits to a Neonatal Intensive Care Unit (NICU) and a rural Level II nursery; personal experience in NICU and rural Level II nursery environments; and discussions with medical professionals within both settings. The authors were able to identify the areas of need to be included within the product portion of the scholarly project.
Knowles' Theory of Andragogy was used in the development of the resource guide.

Based on the results from the literature review, it was found that OT's possess a need for resource guide to be utilized while caring for infants born prematurely in a rural Level II nursery. Further findings from the literature indicated that the needs of the infant, parent, and therapist require equal consideration in order for care to be most effective (American Occupational Therapy Association, 2006). The specific needs of the infant, parent, and therapist identified within the literature were addressed within the product portion of the scholarly project. *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is intended to be used by the OT throughout the evaluation and treatment process of the infant born prematurely.
CHAPTER I
INTRODUCTION

Over 480,000 infants are born prematurely within the United States each year, which is the equivalent of one in every eight infants (Mazurek Melnyk, B., Feinstein, N.F., Aplert-Gillis, L., Fairbanks, E., Crean, H.F., Sinkin, et al., 2006; Kelly, 2006). The medical needs of infants born prematurely are unique from those born at term. Their shortened time in the womb limits the infant’s ability to fully develop, requiring specialized care to assist in their development. This specialized care is typically received in a Neonatal Intensive Care Unit (NICU) or Level II nursery, depending on the medical status of the infant.

In 2004, 790 infants were born prematurely in Wyoming (Freudenthal, 2006). The highest level of care available in Wyoming is a Level II nursery, which results in infants being transferred out-of-state if they require NICU care (Wyoming Department of Health, 2004). The rate of transfers causes limited exposure for medical staff, including occupational therapists (OT’s), to gain comfort and competency to work with infants born prematurely. The result is that the care received between a NICU setting and a rural Level II nursery is incongruent secondary to limited exposure, funding, and availability of continuing education.

The role of OT’s has evolved in NICU environments within the past 30 years, but has yet to be clearly presented in the care of infants in Level II nurseries (Lainwala, Perritt, Poole, & Vohr, 2007), largely due to the limited number of OT’s who work within a Level II nursery. A majority of infants are transferred back to their birth hospital
when they are no longer considered at a high risk for medical difficulties and require NICU care (American Occupational Therapy Association, 2006). However, there are a variety of developmental areas that still need to be addressed, such as feeding, sensory integration and parental bonding (March of Dimes, 2007).

Findings from the literature indicates a need for a resource guide that OT's can access to bridge the gap between care received in a NICU and Level II nursery. OT's have the general educational preparation necessary to provide effective services to infants in the developmental areas previously identified. Additional training is imperative to increase comfort and competency when addressing the unique medical and developmental needs of these infants born prematurely. This requires an OT to access information and resources to gain competency and comfort with treatment delivery.

Based upon the need for additional training, the resource tool *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* was developed. *Bright Beginnings* is based on a literature review, observation and personal experiences within NICU and Level II nursery settings, as well as discussions with medical professionals who work with infants born prematurely. The intention of this resource tool is to provide the OT with resources they can access to care for infants born prematurely in a Level II nursery. It provides general baseline knowledge and guides the OT’s identification of the necessary steps/goals toward gaining comfort and competency in this practice area.

The theoretical framework used to guide the development of *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is Knowles’ Theory of Andragogy. Andragogy is defined as the methods or techniques used to teach adults (Dictionary.com, 2007). Since the product is intended for occupational therapists, OT's
are the adult learners of this product and eventually their colleagues and parents. Based on Knowles’ Theory, Ross-Gordon (2003) identified five assumptions of adult learners. These assumptions are: self-concept, experience, readiness, orientation, and motivation. Knowles’ theory recognizes the individual’s prior knowledge, skills and accomplishments; promoting an adult approach to learning while facilitating an interest to obtain additional knowledge. Consideration of these approaches to the development of this resource will assist the occupational therapist in acquiring the knowledge and skills in preparation for understanding the role of the OT in the Level II nursery.

The following section identifies and defines the key concepts and terminology used within the scholarly project. The terminology was obtained from various sources including: Hunter (2005), Kelly (2006), American Occupational Therapy Association (2006), Wyoming Department of Health (2004). A full list of references is available in the reference section at the end of the scholarly project.

**Terminology**

**Bonding:** the process of gaining emotional attachment between the infant and parent.

**Developmental Milestones:** the emotional, physical, cognitive, and social skills infants/children obtain as they progress through the lifespan.

**High Risk Pregnancy:** when the mother carrying the infant is at risk for delivering the infant prior to the due date or who possesses medical difficulties during pregnancy.

**Level I Nursery:** provides post-natal care to infants typically born at full-term and who require no extra medical attention. These nurseries are equipped with resuscitation equipment and the staff is aware of stabilization techniques to prepare unhealthy infants for transfer to an appropriate facility. Also referred to as a basic care nursery.
**Level II Nursery:** provides care to infants who are ill, but do not require life-saving interventions. Infants who receive care in this setting require more advanced care than healthy infants, but are expected to improve in a brief time period. Also referred to as a specialty care nursery.

**Low Birth Weight (LBW):** an infant who weighs between 1,500 grams and 2,500 grams (5.5 pounds) at birth.

**Neonatal Intensive Care Unit (NICU):** provides care to infants who are considered to be extremely premature and require extreme medical management and/or surgical interventions. Also referred to as a Level III nursery or subspecialty nursery.

**Parent(s):** the primary caregiver of the infant upon discharge.

**Premature Infant:** an infant born prior to 37 weeks gestation. For the purposes of this scholarly project, the terms infant(s) and infant(s) born prematurely will be used interchangeably.

**Rural:** comprised of open country and settlements with fewer than 2,500 residents.

**Sensory Integration:** the infant’s ability to organize sensory information obtained from the environment. The central nervous system (CNS) is responsible for this process.

The scholarly project and its development will be presented in the following four chapters:

- Chapter II presents a review of the literature with pertinent research information, as well as the problem areas and necessary steps to address the issue.

- Chapter III describes the process used to create the resource guide. Also included within this chapter is a comparison of the product to the needs presented within the literature.
• Chapter IV restates the need for the resource tool, an outline of the content of the product, and the theoretical framework used to develop the final product. *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is provided in its entirety.

• Chapter V culminates with information, recommendations for future modifications and research, and project limitations.
CHAPTER II
REVIEW OF LITERATURE

Introduction

Each year, within the United States, over 480,000 infants are born prematurely, an increase of 27% since 1981 (Mazurek Melnyk, B., Feinstein, N.F., Apler-Gillis, L., Fairbanks, E., Crean, H.F., Sinkin, R.A., et al, 2006). According to Kelly (2006), one in eight infants born in the United States in 2002 was delivered prematurely. An infant born prior to 37 weeks gestation is considered to be born prematurely (Hunter, 2005). Infants who are born prematurely and of low birth weight (LBW) require care unique from infants who are born at full-term. For the purpose of this literature review, the terms infant(s) and infant(s) born prematurely will be used interchangeably. The only exceptions will be a term used in a direct quote.

Throughout pediatric care, three levels of nurseries are available to provide the infant with the appropriate level of medical attention:

1. Level I nurseries, also called basic nurseries, provide post-natal care to infants typically born at full-term and who require no extra medical attention. However, these nurseries are equipped with resuscitation equipment and the staff is aware of stabilization techniques to prepare unhealthy infants for transfer to an appropriate facility (American Occupational Therapy Association, 2006).

2. Level II nurseries, or specialty care nurseries, care for infants who are ill, but do not require life-saving interventions. Infants who receive care in this setting require more advanced care than healthy infants, but are expected to improve in a semi-brief time period (American Occupational Therapy Association, 2006).
3. According to the American Academy of Pediatrics and American College of Obstetricians and Gynecologists (2004) (as cited in AOTA, 2006), Level III nurseries, interchangeable with neonatal intensive care unit (NICU) and/or subspecialty nursery, “provide care to infants who are extremely premature, are critically ill or require surgical management” (p.134). Within each Level III nursery, there are four graduated sections; Level IIIA through Level IIID.

a. Level IIIA nurseries provide the lowest level of neonatal care. Infants who have stabilized from serious medical conditions, possessed at birth, are typically discharged from a Level III B, C, or D nursery to a graduated Level III A nursery and are considered in a state of “feeding and growing” (American Academy of Pediatrics, 2004).

b. Level IIID nurseries provide services to the most medically unstable infants born prematurely (American Academy of Pediatrics, 2004).

Mothers, who are considered to have a high-risk pregnancy, are typically admitted to a hospital with all three levels of nursery care. This reduces transfers between appropriate hospitals, which in turn facilitates immediate care for the infant (American Academy of Pediatrics, 2004). However, there are many times when premature labor occurs unexpectedly and it is impossible for the mother to be transferred to a suitable facility prior to delivery. When this occurs, the infant is provided with necessary health measures and is then transferred to the hospital referred by the infant’s physician. The infant remains at the transfer hospital until he/she becomes medically stable and obtains milestones established by the primary physician and medical care team (American Academy of Pediatrics, 2004).

Once the infant’s condition has stabilized, Level II nursery care is typically suitable for their medical needs, however, they may or may not be transferred to their birth hospital. Studies have indicated an increased mortality rate for infants who are transferred from a NICU to a Level II nursery because of the stress caused by transfer (Cifuentes, Bronstein, Phibbs, C., Phibbs, R., Schmitt, & Carlo, 2002). Furthermore, there is a lack of congruency in care received between the hospital that has the specialty NICU levels
and the hospital with a maximum of a Level II nursery. This creates additional stress for
the infant secondary to a restructured care routine (Gordon, 2003).

In 2004 there were 790 infants born prematurely in Wyoming (Freudenthal, 2006). Currently, the highest level of care available in Wyoming is a Level II nursery. In
Wyoming, infants born prematurely with special medical needs are typically transported
to specialized NICU’s in surrounding states. The limited contact that medical staff in
rural facilities, including OT’s, have with critically or moderately ill infants creates a lack
of competency with the unique medical care needs of the infants.

According to Gordon (2003) “nearly half of America’s babies start out their lives
in a rural community” (p. 3). Furthermore, research indicates that the provision of care in
rural areas is substandard to care in urban/suburban areas due to lack of adequate training
and resources secondary to a lower population of infants born prematurely. As stated by
Gordon (2003) “such deficiencies in training have less impact in urban and suburban
areas, which have seen a proliferation of level II units. Outcomes of infants born in
suburban areas are superior to those of neonates born in rural locations” (p 3).

In Wyoming, there is a limited population of OT’s working within Level II
nurseries. This is attributed to the low population of infants that return to the Level II
nurseries, contributing to the limited awareness of OT’s vital role in this setting.
Continuing education, aimed at the special care needs of the infants is largely unavailable
within Wyoming (Wyoming Department of Health, 2004). This results in the services
and knowledge remaining limited by all healthcare professionals, including OT’s, when
the infants return. Wyoming occupational therapists are in need of additional
training/education and resources on how to evaluate and treat infants while also preparing
the parents for the discharge of their infant.
The goal of this scholarly project is to present the case that OT’s possess the knowledge base and skills necessary to provide early intervention to infants born prematurely. The needs of the infant in relation to areas addressed by trained pediatric OT’s, the needs of the parent(s) regarding support and education that OT’s are trained to address, and the role of the OT within the Level II nursery setting were identified within the review of literature. Specifically, the literature review presents:

1. The experience that rural pediatric OT’s have with infants born prematurely fluctuates due to lower numbers of preterm births in a rural setting (Freudenthal, 2006; Wyoming Department of Health, 2004).
2. OT’s comfort level and competency is limited due to minimal exposure to preterm infants (American Occupational Therapy Association, 2006).
3. There is an inconsistency in care between NICU settings and Level II nurseries due to limited funding, exposure, continuing education courses (Gordon, 2003).
4. OT’s are trained to provide a holistic approach which increases the bonding experience between the infant and the parents (American Occupational Therapy Association, 2006).
5. The needs of the therapist, the infant, and the parents require equal consideration in order to provide optimum care (American Occupational Therapy Association, 2006).

The literature review will culminate with the presentation of a proposed resource guide designed to provide resources and general information. This may contribute to the OT’s competency and comfort level in the evaluation process and provision of interventions in the Level II nursery.

**Infant’s Needs in the Level II Nursery**

In order to provide effective interventions to the infant born prematurely, it is imperative that the OT have an understanding of the infant’s experience. A knowledge base of the medical needs and unique developmental process of the infant is the first step to implementing efficient services.
Medical Needs

A typical pregnancy is between 37 and 40 weeks in length; birth earlier than the typical time frame causes undue stress for the infant due to an interruption in proper development. The primary health concern for infants born prematurely is their ability to breathe independently. Lung development in fetuses occurs between 36-37 weeks gestation, therefore, birth at or before 36 weeks typically indicates some level of lung disease (Bush, 2007). The physician and respiratory therapist determine the necessary interventions for pulmonary care. Once a plan has been established, determining the status of the other major organs occurs. The physician will ensure that the infant’s vital organs are working properly prior to the provision of further services (Kelly, 2006).

Gestational age and birth weight must be considered as they are often a determinant of the level of care required and how well the infant will handle interventions (Kelly, 2006).

The Level II nursery has a significant impact on the infant’s ability to grow and thrive. This is the primary area that OT’s will work with the infant, parents, and other healthcare professionals. Since all intervention occurs within the Level II nursery, the OT’s must focus on how to design the environment to best meet the needs of the infant.

Environment

A NICU or Level II nursery environment is especially traumatic for neonates due to the chaotic atmosphere via various machines, communication devices, and excessive handling by the numerous health care professionals on the infant’s medical team (Johnson & Thornhill, 2006; Levy, Woolston & Browne, 2003). This excessive stimulation is difficult for the infant to process due to an immature sensory system. Within the mother’s womb, an infant is enclosed in warmth and tightness, with light and
noise filtered. It is quite an adjustment to move from that safety and security to an environment that is over stimulating.

Infants often do not have the opportunity to form a typical attachment to their parents due to their vast amount of medical needs and their inability to process sensory stimuli (Hunter, 2005). Within a NICU or Level II nursery setting, there is a set schedule for taking vitals, feeding, changing, daily care, and even when to hold the infant. As the infant progresses and begins to display cues for getting their needs met, the schedule remains. This can contribute to the infant becoming emotionally detached from their parents and make it more difficult for a typical bond to be formed once the infant has been discharged home (Hunter, 2005). It is imperative to understand that although these infants are over stimulated more easily than infants born at term, they still require affection and need their attempts at communication to be acknowledged. A balance must be found between their status as premature with medical needs and the fact that they are human beings (March of Dimes, 2007).

Parent’s Needs

Premature births often come as a shock to parents because of the undetectable nature of the circumstance. Although there are risk factors that may indicate a pre-term labor, they are not applicable in all situations. Many times, there is not a medical-based reason for pre-term labor and it begins without any warning signs (March of Dimes, 2007). Often, during the first days, and even weeks of the infant’s life, the primary focus for the medical staff is stabilizing the infant and determining their primary medical needs. The needs of the parents may not be addressed, which causes an already difficult situation to become even more unbearable. Having to accept the fact that their infant is born early is difficult when there is much uncertainty about what is actually occurring
Furthermore, parents are often unfamiliar with the medical team, terminology, and equipment used within the NICU environment and cannot adequately process the events and information received.

As discussed prior, the “parent-infant bonding process”, which typically occurs within the first few weeks of life, is delayed because of the high-stress environment caused by the early delivery and health conditions of the infant (Dudek-Shriber, 2004, p. 510). When an infant is born at term, the bonding process takes place within seconds of birth due to the parent’s ability to immediately hold their child. However, when an infant is born pre-term, medical attention is received and they are hooked up to the appropriate machines, which do not allow the parent and newborn infant immediate contact.

In rural areas, the bonding process is even more delayed as the infants born prematurely, who require ventilator support and extreme medical care, are transferred from their birth hospital to a facility with a NICU. This creates a long distant relationship between the infant and parent. In Wyoming, the closest NICU’s are typically two or more hours away, which may make it impossible for parents to commute on a daily basis. Parents are often feeling forced to decide between staying with their infants and returning to their home for financial purposes. When the parent is present, physical contact is limited due to the high amount of stimulation already received by simply being in a NICU environment (Cameron, Raingangar, & Khoori, 2007). Parents often feel that their role of primary caregiver has been taken over by the medical staff secondary of the critical needs of their infant.

OT’s can assist the infant in meeting developmental milestones, his or her parents in preparing for their infant’s homecoming, and the medical staff in regard to the developmental needs of the infant in a specialized nursery. Through the provision of an
occupation-based resource program for OT’s in rural hospitals, the care received by infants born prematurely in a Level II nursery may be more congruent with the services in a NICU setting. This will also allow physicians to more readily discharge infants to their birth hospital, while facilitating ease in transition for the parents (Lainwala et al., 2007).

**Role of Occupational Therapy**

The role of OT’s has evolved in NICU environments within the past 30 years, but has yet to be determined in the care of infants in Level II nurseries (Lainwala, Perritt, Poole, & Vohr, 2007). A low population of OT’s work within a Level II nursery since a majority of infants, transferred back to their birth hospital, are no longer considered high risk for medical difficulties (American Occupational Therapy Association, 2006). However, there are a variety of areas which still need to be addressed in order to promote optimal development of the infant, including, but not limited to: feeding, sensory integration, and parental bonding (March of Dimes, 2007). OT’s have the educational preparation necessary to provide effective services to infants born prematurely.

**Educational Preparation**

The Accreditation Council on Occupational Therapy Education (ACOTE) standards ensures that all practicing OT’s have received formal educational preparation for clients across the life span, including pediatrics. This formal training includes evaluation, intervention utilizing occupation based skills and techniques, theories, and family collaboration/education. The application of each of the formal areas of training is based upon the use of evidence-based practice to facilitate the implementation of current and effective interventions. A holistic approach is also essential to identifying and
working to meet the needs of the caregivers, who in this case are the parents. In the following section, each of the formal training areas will be discussed in more detail.

Evaluation

The OT has the knowledge base to evaluate each infant, ensuring that his/her needs are met while assisting the infant in accomplishing developmental milestones. The main priority during all processes and procedures, involving the infants, is their safety and well-being. An important form of assessment is through skilled observation where the OT examines the environment and the behaviors the infant exhibits (Hunter, 2005).

There are several standardized assessments utilized within the Level II nursery to evaluate various aspects of the infant’s overall state. All of the assessments require special training, however, not all require certification in order to be conducted (Hunter, 2005). A complete list of evaluations is presented within the product portion of this scholarly project. The most common areas evaluated include: motor state, muscle tone, neurobehavioral capabilities, stress, sensory integration, and reflexes.

Treatment

Once the evaluation of the infant has successfully been conducted, interventions can then be developed and implemented. The utilization of treatment interventions facilitate the infant’s ability to cope with the stresses of being outside of the womb, thus creating a path for a less complicated start at life for both the infant and parents. Interventions must be provided in a sequential manner, as certain components must be in tact prior to functioning more independently. Treatment ideas are also included, in more detail, in the product portion.
Theories

Various occupation-based theories are available and can be implemented by the OT in order to guide the treatment provisions. There are five main theories identified within the product portion of the scholarly project. This will allow the OT to choose the theory which best matches the needs of the infant and the OT’s therapeutic approach.

Family Collaboration/Education

In order to provide the most effective interventions possible, it is essential for the OT to collaborate with the parents to determine their individual needs, priorities, and goals for their infant. Treatment is more valuable when used as an educational opportunity for the parents. Not only does education decrease the stress levels of the parents, it also reduces the risk of re-hospitalization for the infant due to more competent care received at home (Hunter, 2005). Learning styles differ depending on the individual, so the OT must determine the appropriate means of educating each family.

Although there is considerable formal preparation for OT’s to provide quality and essential services to infants in the Level II and their parents, there are also areas that additional experience and knowledge is necessary. Additional training is imperative to increase comfort and competency when addressing the unique medical needs of infants. The following educational needs will be presented in a brief description.

OT Educational Needs

Clinical Knowledge

As stated prior, the OT has a broad knowledge base and possesses the skills required to provide effective and quality occupation-based services. It is required that the OT has experience within pediatric OT prior to working in a Level II nursery (AOTA, 2006). Additional education is necessary and includes areas regarding the infant’s unique
medical needs. The therapist must possess specific insight regarding NICU equipment, diagnoses, and additional support procedures to ensure that the special needs of the infant are met. Prenatal, perinatal, and postnatal phases need to be known as they influence the infant’s development and impact the parent’s perspective of their infant’s stay in the hospital (Hunter, 2005).

Interpersonal Knowledge

Interpersonal knowledge and skills are a key component due to the close contact an OT has with the infant, family, and members of the medical team (Gordon, 2003; AOTA, 2006; Limperopoulos & Majnemer, 2002; Salokorpi, Rautio, Kajantie, & Von Wendt, 2002). The OT must be able to find a balance between authority and empathy when working with the infant and their family. Often, the family utilizes the OT as their contact person and obtains information and support from them. When communicating with family members it is vital to be professional, upfront, and honest while also maintaining a certain level of compassion (Hunter, 2005).

Cultural Competency

The priorities of each family differ due to cultural diversity. Demographic, socioeconomic, and religion are among the many considerations that must be made when working with families as this alters the type of verbal and nonverbal interaction they prefer. This approach creates a bond between the family and the therapist which allows optimal care for the infant.

Proposed Program

This program was designed as a guideline for OT’s with limited exposure to infants born prematurely. The proposed program, Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery is aimed at increasing the consistency
and quality of care provided by OT’s in Level II nurseries. The goals of this program are to increase the comfort level of OT’s who work with infants born prematurely by:

1.) Providing a resource to OT’s, who may provide care in Level II nurseries, as a tool to provide optimum care to infants born prematurely.

2.) Increasing consistency to the care received between suburban/urban communities and rural facilities via education and/or resources to access additional education.

3.) Providing ideas and resources to strengthen knowledge-base regarding evaluations, treatment design, and implementation while remaining family centered.

Organizational Design

The Bright Beginnings: Quick Tips for Occupational Therapist in the Level II Nursery, was designed based on the needs established within the review of literature. Due to the limited exposure rural OT’s have with infants born prematurely, a resource guide may facilitate an increased level of comfort and competency when working within a Level II nursery. In turn, this may contribute to increasing the quality and consistency of care received between a NICU and Level II setting. The need for expansion of the OT’s clinical knowledge, interpersonal knowledge, and cultural competency are addressed in detail within the product portion of the scholarly project. The resource has been divided into three sections to prepare the OT to meet the needs of the infant and his/her parents. The three sections include:

1. OT in the Level II Nursery: Where to Start

2. Infant Interventions: The Journey

3. Infant, Parent, Therapist: Coming Together
Theoretical Model

The Adult Learning Theory utilized in the design of the program is the Knowles’ Theory of Andragogy. Andragogy is defined as the methods or techniques used to teach adults (Dictionary.com, 2007). Since the product is intended for occupational therapists, OT’s are the adult learners of this product and eventually their colleagues and parents of infants born prematurely. In a discussion of Knowles' theory, Smith (1999) stated the five assumptions of adult learners. These assumptions are integrated in the design of 

*Bright Beginnings: Quick Tips Occupational Therapist in the Level II Nursery* are as follows:

1. **Self-Concept:** As the OT matures, he/she moves from dependency of learning to self-directedness. The resource is intended to provide educational information that OT’s can use to prepare themselves for the role of OT in the nursery. The guide is based on current literature in the field which should be updated as new information and research arises.

2. **Experience:** Adults draw upon their experiences to aid their learning. Due to the OT’s past experience in pediatric OT, they will be able to easily retain new knowledge while building on current practices.

3. **Readiness:** The learning readiness of adults is closely related to the assumption of new social roles. The occupational therapist is engaged in the profession of OT and pediatrics and is ready to learn additional information and expand on his/her current knowledge and understanding. The OT is ready to learn additional and new strategies.

4. **Orientation:** As a person learns new knowledge, he/she wants to apply it immediately in problem solving. Learning about the NICU, Level II nursery, and obtaining resources will allow them to understand the treatment intervention based on past experiences so they can more quickly orient themselves to the new knowledge and resources they are gaining.

5. **Motivation:** As a person matures, he/she receives their motivation to learn from internal factors. The interests in this area are his/her primary motivation.

This theory recognizes the individual’s prior knowledge, skills and accomplishments promoting an adult approach to learning while facilitating an interest to obtain additional knowledge. Consideration of these approaches to teaching will assist
the occupational therapist in acquiring the knowledge and skills in preparation for understanding the role of the OT in the Level II nursery.

**Summary**

Within rural areas, the development of a typical parent-child relationship is delayed as infants, who require unique medical procedures, are transferred to a hospital with a NICU. Currently, the highest level of care for infants born prematurely in rural states, such as Wyoming, is a Level II nursery. Therefore, infants must be transferred from their birth hospital to a facility out-of-state, forcing the role of the parent as caregiver to be minimized even further.

When the infant is ready to transfer back, the knowledge and skills of healthcare professionals between the two hospitals may not be as consistent as needed. The transfer of the infants may cause medical staff in rural facilities, including OT’s, to lack comfort and competency due to limited exposure. It is hoped that the *Bright Beginnings: Quick Tips for Occupational Therapist in the Level II Nursery* may increase the comfort level of OT’s by providing a resource guide to facilitate consistency of care between NICU and Level II nurseries and family-centered care. This, in turn, will increase the comfort and feelings of competency of the parents as well. In addition to the therapists utilizing this resource, it is also recommended that they obtain observational hours with a NICU OT and continuing education. This resource is only one piece in the realm of preparing for competency while working in this practice area. The resource will help the therapists identify their educational needs and provide resources to access the necessary information.

Chapter III will provide the methodology that was used in the development of *Bright Beginnings: Quick Tips for Occupational Therapist in the Level II Nursery*. 
CHAPTER III

METHODOLOGY

Through the utilization of various types of research, the authors gained a dynamic perspective on infants born prematurely in Level II nurseries and the need for a resource guide. The result is the design and development of *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery*.

The methodology used in the development of *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is as follows:

1. An extensive literature review was conducted. Journals, textbooks, databases, and credible websites were referenced. The findings from the literature guided the development and completion of the scholarly project.
2. The authors participated in a guided visit to a Neonatal Intensive Care Unit (NICU) and a rural Level II nursery to gain first-hand experience and knowledge within these settings. A baseline knowledge of equipment, the medical team, and the interactions with the infant and parents were developed.
3. Personal experience in NICU and rural Level II nursery environments inspired the need for a resource guide. One of the authors experienced being a parent in these environments. As an occupational therapist, the need was identified.
4. Discussions with medical professionals within both settings were conducted. The authors were able to identify the areas of need to be included within the product portion of the scholarly project.

Based on the results from the literature review and the above-mentioned experiences, it was found that OT’s possess a need for resources to be utilized while caring for infants born prematurely in a rural Level II nursery.

The resource guide is intended to be utilized as a guideline for OT’s within a rural Level II nursery. As the level of education varies between each therapist and is unknown to the authors, this resource guide provides baseline information and allows the OT to
determine the necessary steps to gain comfort and competency. The intention of this resource guide is to provide resources and tips to the OT, who will in turn teach the parents in caring for the special needs of the infant once discharged. Furthermore, the information presented in the resource may encourage other medical professionals to increase their knowledge of the needs of infants born prematurely, while promoting the benefits of OT as a profession.

The design of *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is based on the research literature which identified the following areas of need:

1. The experience that rural pediatric OT’s have with infants born prematurely fluctuates due to lower numbers of preterm births in a rural setting (Freudenthal, 2006; Wyoming Department of Health, 2004).
2. OT’s comfort level and competency is limited due to minimal exposure to preterm infants (American Occupational Therapy Association, 2006).
3. There is an inconsistency in care between NICU settings and Level II nurseries due to limited funding, exposure, and continuing education courses (Gordon, 2003).
4. OT’s are trained to provide a holistic approach which increases the bonding experience between the infant and the parents (American Occupational Therapy Association, 2006).
5. The needs of the therapist, the infant, and the parents require equal consideration in order to provide optimum care (American Occupational Therapy Association, 2006).

A release form was obtained for the use of the pictures within the resource guide.

The pictures in which a release form was not obtained are not copyrighted and are of public domain.
CHAPTER IV

PRODUCT

According to Gordon (2003) "nearly half of America’s babies start out their lives in a rural community" (p. 3). Furthermore, research indicates that the provision of care in rural areas is substandard to care in urban/suburban areas due to lack of adequate training and resources secondary to a lower population of infants born prematurely. As stated by Gordon (2003) "such deficiencies in training have less impact in urban and suburban areas, which have seen a proliferation of level II units. Outcomes of infants born in suburban areas are superior to those of neonates born in rural locations" (p 3).

Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery was designed to be a resource guide when caring for preterm infants in a Level II nursery. This resource was designed for use as guideline for OT’s when working in the Level II nursery, however, it is urged to not be utilized as a sole reference. In order to provide the most effective services to infants born prematurely and their families, it is advised that further knowledge be obtained through 1) observing OT’s within Neonatal Intensive Care Units (NICU’s), 2) attending courses, and 3) researching current treatment practices.

The resource guide contains current information which is organized to facilitate the ease and effectiveness of the provision of services by the OT. In order to offer quality treatment, the OT must be aware of their level of competency and the requirements for increasing this level. Furthermore, the various needs of the infant and parents must be
considered. The following three sections will supply the OT with guidelines to follow during the various stages of the infant’s hospitalization:

1.) OT in the Level II Nursery: Where to Start
   a. Competency Techniques
   b. Role of the OT
   c. Terms and Definitions
   d. Theory Overview

2.) Infant Interventions: The Journey
   a. Developmental Stages
   b. Evaluations
   c. Assessments
   d. Care Plan/Interventions

3.) Infant, Parent, Therapist: Coming Together
   a. Family-Centered Care Practices
   b. Educational Material

Knowles’ Theory of Andragogy focuses on methods and strategies used to teach adult learners. This theory was chosen since OT’s are the adult learners. The five assumptions of this theory are integrated as follows:

1. Self-Concept: As the OT matures, he/she moves from dependency of learning to self-directedness. The resource is intended to provide educational information that OT’s can use to prepare themselves for the role of OT in the nursery. The guide is based on current literature in the field which should be updated as new information and research arises.

2. Experience: Adults draw upon their experiences to aid their learning. Due to the OT’s past experience in pediatric OT, they will be able to easily retain new knowledge while building on current practices.

3. Readiness: The learning readiness of adults is closely related to the assumption of new social roles. The occupational therapist is engaged in the profession of OT and pediatrics and is ready to learn additional information and expand on his/her current knowledge and understanding. The OT is ready to learn additional and new strategies.

4. Orientation: As a person learns new knowledge, he/she wants to apply it immediately in problem solving. Learning about the NICU, Level II nursery, and obtaining resources will allow them to understand the treatment intervention.
based on past experiences so they can more quickly orient themselves to the new knowledge and resources they are gaining.

5. Motivation: As a person matures, he/she receives their motivation to learn from internal factors. The interests in this area are his/her primary motivation.

*Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* provides the OT with a resource guide to access information and resources in the provision of optimum care for the infant and their families throughout the entire hospitalization. The review of literature guided the development of the resource and serves as a guideline for various areas of care in an easily accessible and user-friendly format. The resource guide is comprised of information regarding the therapist, infant, and parents in order to ensure a holistic approach. Due to the varying needs and developmental patterns of each infant, additional references have been identified within the product.
BRIGHT BEGINNINGS:
QUICK TIPS FOR OCCUPATIONAL THERAPISTS IN THE LEVEL II NURSERY

Lindsey Bartholomew, MOTS
Lacey Gramstad, MOTS
LaVonne Fox, PhD, OTR/L, Advisor
University of North Dakota
Master of Occupational Therapy
INTRODUCTION

As an Occupational Therapist (OT) in a rural setting, you have most likely worked with children who range considerably in age and diagnoses. Although you have treated patients with unique needs, infants born prematurely require interventions which are challenging, but rewarding. It is hoped that this resource guide will be valuable as you transition into being an OT within a Level II nursery. This resource was designed for you to use as a guideline when working in the Level II nursery, however, we urge you to not use this as your sole reference. In order to provide the most effective services to infants born prematurely and their families, it is advised that you gain further knowledge through 1) observing OT's within Neonatal Intensive Care Units (NICU's); 2) attending courses; and 3) researching and staying abreast of current treatment practices.

In order for quality care to be provided to the infant born prematurely; this resource guide has been designed to address the needs of the three primary groups in this treatment process: the OT, the infant, and the parents. The OT’s needs in this process may include learning more about the terms and procedures specific to this practice, as presented in
Section 1. The infants' needs generally include: environmental adaptations, feeding techniques, sensory integration, positioning techniques, and parent involvement. Each of these will be discussed in more detail in Section 2. The parents' needs may include: education, training on how to care for their preterm infant, and coping/stress management skills, as presented in the final section.

A release form was obtained for the use of the pictures within the resource guide. The pictures in which a release form was not obtained are not copyrighted and are of public domain.
# Table of Contents

## Section 1

*OT in the Level II Nursery: Where to Start*
- Section Overview 4
- Establishing Competency 5
- The Role of the OT 6
- Terms/Definitions 8
- Theories 18

## Section 2

*Infant Interventions: The Journey*
- Section Overview 35
- Developmental Stages: Fetal Development 36
- Developmental Stages: Typical Infant Development 37
- Infant States 41
- Evaluations & Assessments 45
- Care Plan & Interventions 53

## Section 3

*Parent, Infant, Therapist: Coming Together*
- Section Overview 84
- Discharge Criteria 85
- Parent Educational Material 86

References 87

Picture Release Forms 107
SECTION 1

OT in the Level II Nursery:

Where to Start
SECTION OVERVIEW

OT in the Level II Nursery: Where to Start focuses on your role as an OT within a Level II nursery. Upon completion of this section, you will have attained knowledge on the various components presented within this section. The following will be included:

1) Establishing Competency
   The authors cannot emphasize enough the importance of researching and using other resources. Recommendations for gaining knowledge and increasing competency are included.

2) The Role of OT
   As an OT in a Level II nursery, you will have several responsibilities to meet the needs of the infant born prematurely and their family. Your role will be fulfilled both individually and in collaboration with the infant’s medical team. The specific areas you will focus on are environmental adaptations, feeding, sensory integration, positioning and parent training. Each of these will be presented in more detail.

3) Definitions:
   • Medical Team
     When working with an infant born prematurely, you will be one of the many individuals on the medical team. A list of the common team members and their essential role is included.
   • Health Conditions
     An infant born prematurely is at risk for various health conditions due to insufficient time in the womb to fully develop. The medical issues the infant possesses will affect the type of treatment interventions you can perform safely. Common health conditions and their treatment options are included.
   • Common Terms & Abbreviations
     The NICU medical jargon and abbreviations used within the Level II nursery is essential for you to understand in order to work effectively in this setting. Common terms and abbreviations are included.

4) Theories
   During treatment interventions, you will choose a theory to guide your practice. An overview of: Canadian Model of Occupational Performance (CMOP), Model of Human Occupation (MOHO), Occupational Adaptation (OA), Ecological Model of Occupation, and Sensory Integration (SI) are presented to assist you in selecting a theory that best fits the infants’ and families’ needs, as well as your therapeutic approach.
ESTABLISHING COMPETENCY

In order to become comfortable and competent while providing services to infants born prematurely in a Level II nursery, it is essential that you use other resources and opportunities. Following are our recommendations:

• Observation of OT's in a NICU
  A majority of the infants you will be caring for will be discharged to your facility from a NICU. Through the observation of their care routines in the NICU, you will be able to provide higher quality and consistent services to the infant. This may ease their transition into your facility and facilitate a more successful recovery.

• Attending courses
  Enrolling in continuing education courses and attending workshops/in-services on topics related to infants born prematurely is an outstanding way to gain knowledge. Attending educational courses also allows you to network with other therapists working in the same field.

• Professional Reading
  Research is essential due to the focus of OT on Evidence-based practice (EBP). In order for your patients to receive the best care possible, staying up to date with new and emerging trends is critical. Data-bases, OT journals, and texts are great tools to use while researching.

On the following page you will find a list of recommended texts and scholarly articles which can be used as references:
Recommended Reference Material


**THE ROLE OF OT**

The infant, born prematurely, presents with various needs. Your role, as an OT in a Level II nursery, may appear vastly different than your past professional roles. Yet, you will find that your responsibilities still include providing care that allows the patient to function at the optimum level while involving the family. The only difference is that now, your patient is much smaller than you may be used to. This section will provide an overview of the various roles needed to care for the infant and their family. Each area of treatment will be discussed further in Sections 2 and 3.

**Environmental Modifications**

As an OT in a Level II nursery there are many environmental modifications you will need to make in order to help the infant adjust to the overwhelming sensory input from the environment. The two main areas include the lighting and noise level within the nursery.

You will need to collaborate with the Level II nursery staff to ensure that the adaptations made to the environment meet the needs of the infant. Many of the modifications cannot be achieved by an individual, but by the whole team, in order to make it effective.
**Lighting:**

The lighting in the nursery is often bright and difficult for the infants to integrate. Common best practice guidelines include:

1) Lower the lights in the nursery for a majority of the day. Many infants sleep eighty percent of the day, which is difficult to do when the lighting is bright. Infants born prematurely are unable to close their eyes tightly until 30 weeks gestation, making it difficult to filter the lights overhead. Dim lights help the retina to develop as well as encouraging the eyes to focus on objects.

2) Turn down the lighting in the nursery by placing shades over the windows, removing bulbs from florescent lights if there is more than one, and using individual bedside lamps so that when the team is working with an infant the other infants don’t have to have the lights shining on them.

3) Place a mask over the infant’s eyes to help protect them if the lighting cannot be dimmed by the infant’s bed. This should not be done for the entire day, but long enough to allow the infant time to sleep. Little amounts of light are important for the infant to promote eye development, sleep/wake cycles, and decrease jaundice. It is critical that they begin to develop their sleep/wake cycles. This is achieved through allowing small amounts of light frequently throughout the day to develop a schedule. This will also help to facilitate weight gain due to the infant being alert and awake during certain times of the day. Natural lighting and lights that do not have ultraviolet lighting will also help to decrease the infant’s bilirubin if they have jaundice.

**Noise Level:**

Noise levels in a Level II nursery can be upsetting for infants. Loud noises can increase the infant’s stress level, decrease their physiologic state,
and change their behaviors. In an ideal nursery, the room would have acoustic ceiling tiles, carpet floors, and no overhead intercoms. Adapting the nursery can be costly and many facilities are unable to afford the extra expenses to change their environment.

Best practice guidelines have identified several tips to decrease the sound in the nursery which include:

1) Having lights on phones so the ringing is lower or non-existent and the blinking light indicates the phone is ringing

2) Have medical staff turn their pagers to vibrate

3) Visual alarms on the machines

4) Consider an isolette cover to reduce the noise around the infant, as well as to limit the amount of light shining on them

5) Educate the medical staff and the parents on how the sound effects the infant and ask that all conversations take place in an area away from the infants within the nursery

Feeding Techniques

As an OT in a Level II nursery, you will assist in providing various feeding techniques to infants born prematurely. You will work with the multidisciplinary team to help develop feeding techniques. Areas for consideration are:
1) Positioning of the infant in a way that facilitates proper feeding which is presented in more detail in the positioning section of the OT's role.

2) When you are feeding the infant, the environment needs to be calm and quiet so that the infant does not become overwhelmed.

3) You need to be aware of the infant’s cues/states that suggest they are hungry and ready to eat. Infant’s cues/states are discussed in further detail within the Infant Intervention section.

4) In order for the infant to begin feeding they need: to have developed a sleep/wake cycle; be able to breathe independently; have the ability to express feeding cues such as crying before eating times and; display the rooting reflex. This typically occurs when the infant is 35 weeks.

There are two types of sucking techniques: nonnutritive and nutritive. Nonnutritive (dry) sucking is when the infant sucks on a pacifier. This assists the infant to develop a sucking pattern when they are ready to begin nursing and is calming to the infant. Nutritive sucking is when the infant has the ability to breastfeed or is beginning to drink from a bottle.

The physician may want to use gavage feeding or nasogastric feeding until the infant is able to express feeding cues or you may recommend it. This method of feeding is when a tube is attached the infants cheek and is ran through their nose to their stomach. Feeding the infant with a
nasogastric tube, will help to decrease the infant’s stress level and conserve his/her energy.

**Sensory Integration**

Infants born prematurely are often unable to process sensory input due to their underdevelopment at birth. This difficulty can often cause stress and discomfort. Many of the sensory adaptations you will perform coincide with environmental adaptations, since most environmental stimuli is over-stimulating to the infant.

When you are integrating new types of sensory, the infant needs to be in a quiet alert state. Textural stimulus is often presented to the infant very early. You will first need to introduce the new texture by first talking to the infant so that they know that you are there. Then gently place the item directly on the infant’s skin and monitor their cues. If the infant becomes stressed during this, you need to remove the tactile stimulus. Some textures, such as sheep skin, may be soothing and may calm the infant when displaying stress signs. As a therapist, you will need to observe to gain an understanding of what types of sensory input is stressful or calming to the infant.
Infant massage has been found to be comforting to the infant and may provide a positive impact on the infant's physiologic status. When massaging the infant, you need to monitor their physiological and behavioral cues to ensure that they do not begin to exhibit health decline during the interactions.

Handling infants during treatments and procedures can cause undue pain and stress to the infant because their tactile system is unable to process all the sensory input that is being applied during that time. Massage is a type of touch to provide them with a feeling of comfort and calmness. Benefits of massage may include:

1.) Decrease tactile sensitivity
2.) Decrease irritability and stress
3.) Is calming
4.) Increase the infant-parent bond
5.) Promote weight gain

Prior to touching or handling the infant, you should talk in a calm quiet voice to allow the infant to recognize that you are there. This allows the infant time to process that you are there and decreases their startle
reaction. Specific massaging guidelines will be discussed further in Section 2 of the resource on pages 69 through 72.

**Positioning Techniques**

Understanding how to position the infant is important for neuromotor control, structural alignment, and to improve their physiological status. Your central goal, when positioning, is to encourage comfort, security, extremity flexion to midline, and to decrease the risk of deformities.

The types of positions that are encouraged most frequently include supine, prone, and side-lying. Each of these positions help provide the infant with different types of input. The infant needs to be repositioned every 2-4 hours at the minimum or if the infant demonstrates the need for a position change before that time frame. Repositioning is important to prevent deformities and sores.

The materials typically used when positioning the infant include blankets with various textures/materials and sheep skin. Often times, the infant is placed in a concaved nest such as a “Snuggly” which supports the infant on all sides. Swaddling the infant in a blanket is also utilized frequently. These techniques provide the infant with security similar to that of the womb. The position that you will use depends on the specific
needs of the infant. For further treatment methods used with these positions, refer to the interventions located in Section 2.

1) Supine position promotes flexion in the extremities. This is when the infant is placed on their back. Supine is typically the only position used during the first few days after the infant is born, because it is easier for the medical staff to access the infant. When you are using this position, it is important to keep the infant’s head in midline. Foam donut-shaped pillows or rolled blankets will help maintain the position of infant’s head. Gel pillows may be used as well to help prevent flattening of the infant’s head. Supine allows the infant to explore their environment visually and increases the parent-infant bond due to the face to face interaction that can take place. Supine is also the recommended position for infants to sleep in once discharged home to prevent Sudden Infant Death Syndrome (SIDS).

2) Prone positioning promotes an increase in oxygen saturation levels and also helps to facilitate flexor tone. This position is when the infant is placed on their stomach. Prone positioning also assists in reduced aspiration risks, decrease in reflux, and facilitates neck extension, weight bearing to the infant’s extremities, and improves gross motor skills. Prone positioning is often used with infants who are born with spina bifida or other spinal cord injuries.

3) Side-lying allows the infant to bring their extremities to midline and promotes hand to mouth movement and activity. Side-lying is useful when the infant is in stress state and is arching their back. This position is also useful for feeding and digestion. Although this position is therapeutic, it is important to note that the side-lying position has been considered to increase the risk for SIDS. As an OT, you will need to educate the parents on carefully positioning the infant at home to prevent SIDS.
Parent Training

When working with the infant you need to collaborate with the families. This is often an extremely stressful time for the parents. You will have to educate the parents on various techniques on how to care for their infant because they require different care. Areas that parents will need to be trained on include:

1) Caring for the infant’s daily needs: how to handle their infant; lifting, carrying, changing diapers, feeding, etc.

2) Taking vitals and monitoring the physiologic state of the infant, which nursing typically teaches, but you need to be informed on in case there are any questions.

3) Additional needs of the infant to be determined on a case-by-case basis.

Educating the parents is important to help them feel ready for the infant’s discharge home. When working with the parents, it is also critical to assess their well being. You will need to discuss with the parents different coping strategies and ways to relieve stress that are available for them. Assisting the parents in finding ways to deal with the experience of having an infant born prematurely will increase their ability to care for their infant once they are discharged home. In Section 3 of the Resource
Guide, there is educational material that will provide the parents with coping strategies and how to care for their infant born prematurely.
**DEFINITIONS: MEDICAL TEAM**

**Case Manager**
Assists in planning, coordinating, and monitoring the infant’s care while also providing education and support to the parents. They may also help the parents with issues regarding insurance, discharge, and referrals.

**Charge Nurse**
The nursing staff will be present at all times during the care of the infant. All general care is provided by the nurses (feeding, bathing, vitals). A typical nursing shift is either 8 or 12 hours.

**Chaplain**
A religious mentor who provides spiritual guidance. Support through counseling may also be provided.

**Neonatologist**
A physician who has specialized knowledge and training to care for infants born prematurely. Depending on the facility, either a neonatologist or pediatrician will be the primary care provider for the infant.

**Pediatrician**
A physician with special training to care for infants, children, and adolescents. If a neonatologist is not at the facility, a pediatrician may be the infant’s primary care provider.

**Physical Therapist (PT)**
Assists with the development of the larger muscle groups in the infant. The primary objectives include: strengthening, increasing endurance, range of motion, and positioning.

**Respiratory Care Practitioner (RCP)**
Provide pulmonary care to the infant as needed. The primary role of the respiratory therapist is to monitor and manage oxygen levels and blood gas acquisition.
Speech and Language Pathologist (SLP)
Professionals who work with patients who have speech and/or language difficulties. Within a Level II nursery, the SLP will primarily work on feeding techniques.

Social Worker
Professional who works very closely with the family and all members of the medical team. The family and social worker build a strong relationship as they provide a scope of services which range from counseling to education to referrals.
DEFINITIONS: EQUIPMENT

"Blender"
A machine which mixes pure oxygen, air, and other gasses in exact increments and delivers it to the infant. A pulse oximeter will measure the amount of oxygen in the infant’s blood, which determines the ratio of oxygen the infant needs.

Continuous Positive Airway Pressure (C-PAP)
A machine that provides a continuous flow of oxygen in order to keep the lung passages open. The oxygen is delivered through small tubes inserted into the infant’s nose (nasal cannula).

Drainage Pump
Prevents the accumulation of secretions and bacteria in the stomach. The pump is attached to the naso-gastic (NG) tube. The pump can be programmed to section continuously or in time-specific intervals.

“Dinamap”
Takes the infant’s blood pressure at specific times, which is programmed into the machine. A plastic cuff is placed around the arm or leg of the infant and automatically inflates.

Intravenous (IV) Pumps
IV lines are inserted into the infant’s veins to directly insert fluid or medications. The pumps regulate the time intervals and amount of fluid received.

Incubator
Is a clear, plastic, crib-like bed that provides a warm, clean environment for the infant. The incubator also protects the infant from excess noise, cool air, infectious objects, and being over-handled. The term “isolette” is often used interchangeably, as it is a popular brand of incubator.

Oxygen Hood
Supplies oxygen to an infant who can breathe on his/her own, but requires extra oxygen. The hood fits over the infant’s head and is clear plastic.
Phototherapy Lights ("Bili Lights")
Utilized when the infant displays a yellow color to skin, which indicates Jaundice. The presence of bilirubin in the blood causes Jaundice. The infant is placed under these lights to help break down the bilirubin. No ultraviolet light is delivered from these lights to protect from skin damage. The infant is given a special set of "sun glasses", which are piece of cloth or material, to ensure vision damage is not evoked.

Physiologic Monitor/Vital Signs Monitor
Provides a constant display of the infant’s heart rate, heart rhythm, breathing rate, and central venous pressure. The monitor is attached to sensors which are securely placed on the infant. Alarms are programmed to sound when the rates go under a certain level.

Pulse Oximeter ("Pulse Ox")
Monitors the oxygen saturation of the infant’s blood. This is done through a light shining through the infant’s skin and then measuring the light color that is transmitted. Blood that is being pumped arterially, or by the heart from the lungs, is red.

Scale
Is used to weigh the infant and is considered to be one of the most important pieces of equipment in a Level II nursery. A routine for weighing is developed as the weight of the infant determines amounts of medication and feeding schedules. The weight is measured in grams; 1 pound is equal to 454 grams.
DEFINITIONS: COMMON HEALTH CONDITIONS

Anemia of Prematurity
This is a low blood cell count. The amount of hemoglobin delivered to the infant’s organs decreases. Anemia is often caused by too much blood being collected for lab work. The most effective treatment is to reduce the amount of blood taken from the infant.

Apnea and Bradycardia (Brady’s)
Apnea is a lapse in breathing for 15 seconds or more. When apnea occurs, it causes the heart rate to decrease. This is called bradycardia. Apnea can be treated by medication to assist with breathing regulation. Most infants will outgrow apnea spells prior to discharge. If apnea still occurs, an apnea monitor will be sent home with the infant.

Chronic Lung Disease/Bronchopulmonary Dysplasia (BPD)
Infants are considered to have this disease when they require oxygen support for a month or more. This disease is treated by providing the infant with the appropriate form of breathing support, whether it is from ventilator or oxygen through a nasal cannula. As the infant grows and the lungs develop, he/she will outgrow the disease.

Fetal Alcohol Syndrome
Caused by the mother’s excessive intake of alcohol during pregnancy. This causes the infant to be small in size and may have a combination of medical anomalies.

Hyaline Membrane Disease (HMD)
Refer to Respiratory Distress Syndrome

Hydrocephalus
Enlargement of the cranium. This is caused by the obstruction of cerebrospinal fluid.

Jaundice
Caused by an immature liver, which is not able to filter out a yellow substance called bilirubin. The liver produces more bilirubin than the liver
is able to filter. An infant with Jaundice will have a yellowish tint to the skin. Placing the infants under special lights will help the bilirubin break down.

**Respiratory Distress Syndrome (RDS)**
Breathing disorder caused by lungs which are not yet fully developed. Surfactant is a liquid that is necessary for lungs to possess elastic qualities and expand easily. This substance is typically not present in infants born prematurely. The absence of the surfactant makes it difficult for the infant to inflate the lungs and they may collapse. The treatment is dependent on the severity of the disease. A respirator is sometimes needed to assist the infant in breathing. Other times, an artificial form of surfactant can be used and the infant’s breathing condition will improve within weeks or even days. Also known as Hyaline Membrane Disease (HMD).

**Respiratory Syncytial Virus (RSV)**
Illness of the lower respiratory tract. RSV may cause apnea (lapses in breathing) or bronchiolitis (infection in the lung’s small breathing tubes), or chronic lung problems. Infants born prematurely are at high risk for developing RSV due to their weak immune systems. Treatment of RSV has not yet been determined. The pediatrician will determine the appropriate course of treatment depending on the infant’s other health factors.

**Retinopathy of Prematurity (ROP)**
An eye disease caused by the under-developed retina. There are various severities of the disorder. Mild cases do not require treatment and will resolve independently. More severe cases may cause eye damage and even blindness and will require surgical intervention. The pediatrician will determine the appropriate course of treatment.

**Spina Bifida**
A defective closure of the neural tube in the spinal column. A cystic lesion forms on the infant’s back, causing paralysis below the unclosed area. There are three types of Spina Bifida and treatment depends on the severity.
DEFINITIONS: COMMON TERMS & ABBREVIATIONS

Apgar Scores (Apgars)
Assesses the condition of the infant at birth and includes: heart rate, respiratory effort, muscle tone, reflexes, and color. This is done 1 minute and 5 minutes after birth. The scale ranges from 1-10, with 10 being perfect and 3 indicating severe health problems.

Appropriate for Gestational Age (AGA)
Weight at birth that is between the 10th and 90th percentile on a standardized growth chart.

Chronological Age
The infant’s age from their date of birth.

Corrected Age
The age of the infant if born on the due date, rather than prematurely. To determine the corrected age, a formula is available. The number of weeks the infant was born prematurely is calculated by subtracting gestational age from 40 (which is a term pregnancy). That number is then subtracted from the infant’s chronological age. Example: an infant born at 32 weeks was born 8 weeks prematurely (40-32=8). On the infant’s 1st birthday, their corrected age would be 10 months (the birth date was 2 months prior to the due date). When assessing developmental status, corrected age is typically used until the infant reaches his/her 2nd birthday.

Extremely Low Birth Weight (ELBW)
Weight less than 1,000 grams at birth.

Gestational Age
The number of weeks the infant was in utero (the time the mother was pregnant) before birth. This is determined based on the mother’s last menstrual period or by results from an ultra-sound.

Large for Gestational Age
Weight at birth that is above the 90th percentile on a standardized growth chart.
Low Birth Weight (LBW)
Weight between 1,500 grams and 2,500 grams (5.5 pounds) at birth.

Small for Gestational Age (SGA)
Weight at birth that is below the 10th percentile on a standardized growth chart.

Ultra-low Birth Weight (ULBW)
Weight less than 750 grams at birth.

Very Low Birth Weight (VLBW)
Weight between 1,000 grams and 1,500 grams at birth.

A: Apnea
ABG: Arterial blood gas
ABR: Auditory brain stem response
AEP: Auditory evoked potential
AGA: Appropriate for gestational age
A-line: Arterial line
AOP: Apnea of Prematurity
APIP: Assessment of Preterm Infant Behavior
AROM: Assisted rupture of membranes
AS: Left ear
As & Bs: Apnea and bradycardia
ASD: Atrial septal defect
AU: Both ears

B: Bilateral, or Bradycardia
BAEP: Brain stem auditory evoked potential
BAER: Brain stem auditory evoked response
BIH: Bilateral inguinal hernia
BPD: Bronchopulmonary dysplasia
BPM: Beats per minute (pulse)
BW: Birth weight

CAN: Cord around neck
CBC: Complete blood count
CDH: Congenitally dislocated hip
CHF: Congestive heart failure
CLD: Chronic lung disease
CNGF: Continuous nasogastric feeding
CNS: Central nervous system
COGF: Continuous oro gastric feeding
CPAP: Continuous positive airway pressure
CPT: Chest physical therapy
C/S: Cesarean section
CSF: Cerebrospinal fluid
CTF: Continuous tube feeding
CXR: Chest x-ray

D5W: 5% glucose solution
D10W: 10% glucose solution
DIC: Disseminated intravascular coagulation
DTGV: Transposition of the great vessels

ECMO: Extracorporeal membrane oxygenation
ELBW: Extremely low birth weight (less than 1,000 grams)

FEN: Fluids, electrolytes, nutrition
FHR: Fetal heart rate
FiO2: Fraction of inspired oxygen (percent of oxygen concentration)
FT: Full term

G: Gravida (pregnancy(ies))
GA: Gestational age
GBS: Group B streptococcus
GER: Gastroesophageal reflux
GERD: Gastroesophageal reflux disease

HAL: Hyperalimentation (same as TPN)
HC: Head circumference
HFV: High frequency ventilation
HFJV: High frequency jet ventilation
HFOV: High frequency oscillating ventilation
HIE: Hypoxic-ischemic encephalopathy
HMD: Hyaline membrane disease
HR: Heart rate
HSV: Herpes simplex virus
HTN: Hypertension
HUSG: Head ultrasound

ICH: Intracranial hemorrhage
ICN: Intensive care nursery
IDM/IODM: Infant of diabetic mother
IDV: Intermittent demand ventilation
IH: Inguinal hernia
IMV: Intermittent mandatory ventilation
I/O: Intake/output
IPRB: Intermittent positive pressure breathing
IRV: Inspiratory reserve volume
IUGR: Intrauterine growth retardation
IV: Intravenous
IVDA: Intravenous drug abuse
IVF: In-Vitro Fertilization, or Intravenous feeding
IVH: Intraventricular hemorrhage

Kcal: Kilocalories

L or LC: Living children
LA: Left atrium
LBW: Low birth weight (Less than 2,500 grams)
LGA: Large for gestational age
LMP: Last menstrual period
L/S ratio: Lecithin/Sphingomyelin ratio
LTGV: Physiologicaly corrected transposition of the great vessels
LV: Left ventricle

MAP: Mean airway pressure
MAS: Meconium aspiration syndrome
MCA: Multiple congenital anomalies
MDU: Maternal drug use
MRSA: Methicillin-resistance Staphylococcus aureus
MRSE: Methicillin-resistant Staphylococcus epidermidis

NB: Newborn
NBAS: Newborn Behavioral Assessment Scale
NC: Nasal cannula
NCPAP: Nasal continuous positive airway pressure
ND: Nasoduodenal
NEC: Necrotizing enterocolitis
NG: Nasogastric
NGT: Nasogastric tube
NICU: Neonatal intensive care unit
NIDCAP: Neonatal Individualized Developmental Care and Assessment Program
NNNS: Neonatal Network Neurobehavioral Scale
NNS: Nonnutritive sucking
NO: Nitric acid
NP: Nasopharyngeal
NPCPAP: Nasopharyngeal continuous positive airway pressure
NPO: Nothing by mouth
NS: Nutritive sucking
NTE: Neutral thermal environment

O2 sat: Oxygen saturation
OD: Oral-duodenal; right eye
OG: Oral gastric
OGT: Oral gastric tube
OS: Left eye
OU: Both eyes

P: Pulse or para (Births)
P1: Primipara (First birth)
PaCO2: Arterial partial pressure of CO2
PaCO2: Arterial partial pressure of O2
PCA: Postconceptional age
PDA: Patent ductus arteriosus
PEEP: Positive and expiratory pressure
PFC: Persistent fetal circulation
PICC: Percutaneously inserted central catheter
PIE: Pulmonary interstitial emphysema
PIH: Pregnancy-induced hypertension
PIP: Pulmonary insufficiency of the preterm or Peak inspired pressure
PO: By mouth
PPD: Packs per day (referring to smoking)
PPHN: Persistent pulmonary hypertension of the newborn
PROM: Premature rupture of membranes
PPROM: Prolonged premature rupture of membranes
PS: Pulmonic stenosis
PPS: Peripheral pulmonic stenosis
PT: Preterm labor
q: Every
qh: Every hour
qid: Four times per day
RA: Right atrium
RBC: Red blood cell
RDS: Respiratory distress syndrome
ROM: Rupture of membranes
ROP: Retinopathy of Prematurity
RPR: Rapis plasma regain
RRR: Rate, rhythm, respiration
RV: Right ventricle
SA: Substance abuse
sats: Oxygen saturation levels
SCN: Special care nursery
SGA: Small for gestational age
s/p: Status post
SROM: Spontaneous rupture of membranes
SVD: Spontaneous vaginal delivery
TA: Truncus arteriosus
TAPVR: Total anomalous venous return
TCAN: Tight cord around neck
TCM: Transcutaneous monitor
TcPO2: Transcutaneous oxygen pressure
TLC: Total lung capacity
TORCH: Congenital viral infections (includes: toxoplasmosis, rubella, cytomegalovirus, and herpes)
TPN: Total parenteral nutrition
TPR: Temperature, pulse, respiration
TRDN: Transient respiratory distress of the newborn
TTN: Transient tachypnea of the newborn
UAC: Umbilical artery catheter
UAL: Umbilical artery line
ULBW: Ultra low birth weight (Less than 750 grams)
URI: Upper respiratory infection
USG: Ultrasound
UTI: Urinary tract infection
UVC: Umbilical venous catheter

VEP/VER: Vision evoked potential/response
VSD: Ventricular septal defect

WBC: White blood cell count
WBD: Weeks by date (for gestational age)
WBE: Weeks by examination (for gestational age)

The information on pages 18 through 30 was obtained and adapted from:

2) http://www.preemieinfant.ca/preemies_problems.cfm
3) www.marchofdimes.com
4) http://www.pslinc.com
The following chart provides a brief overview of five models which may be used to guide treatment interventions. As a therapist, you have developed your own clinical judgment and have created a unique treatment approach.

The following theories have been included to aid in the decision-making process of which model best fits you and your patient. Please note that although a certain theory may work with one patient, another may be more effective in a different situation. Please refer to the following texts for in-depth information on each of the theories:


<table>
<thead>
<tr>
<th>Theory</th>
<th>Author(s)</th>
<th>Key Components</th>
<th>Pros</th>
<th>Cons</th>
<th>Additional Information</th>
</tr>
</thead>
</table>
| Canadian Model of Occupational Performance (CMOP) | Canadian Task Force | • Environment Context in which activities occur Includes: physical, cultural, and social | • Spirituality is core of the client and provides them with meaning in their life and includes their values, beliefs, and goals  
• Occupation Includes: self-care, productivity, and leisure  
• Person The center of the model Spirituality is the core of the person | • Parents must be educated and know what their goals are  
• Parents must collaborate with the OT and be part of the treatment team | • Used in various setting with different ages  
• CMOP uses the Canadian Occupation Performance Measure (COPM) for an assessment tool. *Parents will be able to answer the questions based on their feeling about their infant’s needs and their concerns |
| Model of Human Occupation (MOHO)           | Gary Kielhofner | • Volition The human drive for completing tasks Personal causation: the client’s ability to reflect on task completion  
Values: what the client finds meaning in  Interests: what the client enjoys doing | • Client-centered  
• Provides 19 assessments that may be used with the family  
• Helps establish the new role of being a parent with an infant born prematurely | • Parents need to adapt to the new addition to their family and may need to change their habits, roles, and volition. | • May be used in any setting  
• Occupation is completed in three stages: participation, performance, and skill |
| Occupational Adaptation (OA) | Jannette K. Schkade and Sally Schultz | • Person  
Occupational Environment  
Adapting challenging occupations | • Client-centered  
Looks at the clients environment  
Adapts occupations that may be challenging to the client | • The client must be motivated and want to achieve mastery of the new skill  
The OT’s role is a facilitator | • A person desires mastery of their occupational roles  
Occupation is used for leisure, restoration, and productivity  
Adapting to challenges must be done by the client’s internal drive and motivation  
Occupation must be meaningful to the client |
| Ecological Model of Occupation | Winnie Dunn Catana Brown and Mary Jane Youngstrom | • Person  
Addresses the client’s past experiences, values, interests, sensorimotor, cognition, and psychosocial skills  
The person makes their decisions based | • Client-centered  
Proves five types of interventions and defines them: establish/ restore, adapt/modify, alter, prevent, and create | • The Level II nursery environment may create a barrier to the clients task performance | • Highlights the contexts in which task performance occur |
on their context

- **Context**
  - Key focus of the model
  - The model believes the context surrounds the client
  - Two types of Contexts: temporal and physical

- **Task**
  - Behaviors that enable the client to fulfill goals
  - Organized to fit the client's roles

- **Performance**
  - Client's skills and abilities

### Sensory Integration (SI)

| Jean Ayers | • Aims to help the body organize and understand the sensory input from the environment and then use it to plan motor behavior | • Address the sensory systems: vestibular, proprioceptive, auditory, taste, tactile, and visual | • Medical model approach – uses "top down approach" in which the OT looks at the impairment first and then the client
• Child must have an inner drive to seek out sensory input | • Created for children
• Difficulty in processing sensory input may mean there is a type of sensory module impairment
• Uses various types of equipment and environments during the intervention |
SECTION 2

INFANT INTERVENTIONS:

THE JOURNEY
**SECTION OVERVIEW**

*Infant Interventions: The Journey* provides educational material focusing on the typical needs presented by the infant born prematurely. Upon completion of this Section, you should have a clear understanding of the material presented, which will increase the effectiveness of the treatments you use during sessions with the infants.

1) Developmental Stages
   - *Fetal Development*
     It is important for you to have a baseline understanding of the development of the fetus in order to fully understand the medical status of the infant born prematurely. The major milestones and when they occur during gestation will be included.
   - *Typical Infant Development*
     Development occurs in a sequential pattern and must be understood by you in order to effectively determine the priorities for the infants you will be working with. A chart of developmental stages by month will be included.

2) Infant States
   The state(s) of the infant born prematurely are a determinant of what they are prepared to handle at any given moment. By gaining an understanding of the various states and what they indicate, the time you spend working with the infant will be more valuable.

3) Evaluations & Assessments
   There are several evaluations and assessments that were developed to measure various aspects of the infant’s development. A chart of available evaluations and assessments and information regarding their use is included.

4) Care Plan & Interventions
   The possibilities for a care plan and intervention techniques for the infants you will be working with are unlimited. We have included general treatment interventions to provide you with a guideline for services. It is intended that the interventions serve as a reference and you will build off of them to fit the specific needs of the infants and their families.
<table>
<thead>
<tr>
<th>Gestational Age &amp; Weeks Premature</th>
<th>Developmental Facts/Milestones</th>
<th>Indications for the Premature Infant</th>
</tr>
</thead>
</table>
| 25 weeks gestation 15 weeks premature | -Typical size is 1 ½ lbs. and 8 ¾ in. long from crown to rump  
- The earliest an infant can be born with a chance of survival  
- Skin is thin and clear. There is no underlying fat  
- Genitals are clearly developed | - Most systems are under-developed, which indicates a need for intensive medical care/stabilization.  
- Requires temperature regulation.  
- Typically cannot feel pain. |
| 26 weeks gestation 14 weeks premature | -Typical size is 2 lbs. and 9 ¼ in. long from crown to rump  
- Distinct sleep/wake cycles  
- The 5 senses are developing | - Requires intensive medical treatments/stabilization.  
- As systems develop, stimuli may become noxious. |
| 27 weeks gestation 13 weeks premature | -Typical size is a little over 2 lbs. and 15 ¼ total in. long  
- The retina of the eye develops all of its layers. Light information is transmitted to the brain and processed. The infant can open and close eyes | - The infant will respond to sounds more consistently. The nerve fibers in the ear are developed.  
- The infant can discriminate between light and dark. |
| 28 weeks gestation 12 weeks premature | -Typical size is 2 ½ lbs. and 15 ¼ total in. long  
- Able to respond to stimuli: touch (pain), light, sound | - Stimuli affects the infant’s growth, respiration, and heart rate.  
- The infant is able to notice familiar voices (i.e. parents). |
| 29 weeks gestation 11 weeks premature | -Typical size is 2 ¾ lbs. and 16 ¾ total in. long  
- Able to suck it’s thumb, cry, and hiccup | - Will cry more often to communication needs.  
- The infant’s brain is able to control basic breathing and body temperature regulation. |
| 30 weeks gestation 10 weeks premature | -Typical size is 3 lbs. and 17 total in. long  
- Display more drowsy states and are less active | - The infant’s head typically grows as it is a time for rapid brain growth.  
- Bone marrow begins to produce red blood cells.  
- The infant’s hair will begin to |
<table>
<thead>
<tr>
<th>Week Gestation</th>
<th>Typical Size</th>
<th>Observations</th>
</tr>
</thead>
</table>
| **31 weeks gestation**<br>9 weeks premature | Typical size is 3½ lbs. and 18 total in. long | - The infant builds up more fat deposits and muscle mass. The skin will turn from red to rosy pink.  
- The infant’s bones become hardened.  
- The infant goes through another period of brain growth. |
| **32 weeks gestation**<br>8 weeks premature | Typical size is 4 lbs. and 19 total in. long | - All five senses are well developed.  
- Requires some light for stimulation of the retinas, but not bright enough to wake the infant.  
- The infant experiences REM cycles and may have dreams. |
| **33 weeks gestation**<br>7 weeks premature | Typical size is 4 ½ lbs. and 19 ½ total in. long | - Neurons and synapses are developing, which forms the connections in the infant’s brain necessary for typical function.  
- The infant will now take occasional deep breaths. This encourages surfactant production for independent breathing. |
| **34 weeks gestation**<br>6 weeks premature | Typical size is 5 lbs. and 19 ¾ total in. long | - The infant’s suck-swallow-breathe response develops.  
- Nipple feeding becomes utilized more frequently.  
- The infant has more distinct sleep and wake cycles. |
<p>| <strong>35 weeks gestation</strong>&lt;br&gt;5 weeks premature | Typical size is over 5½ lbs. and 20 ¼ total in. long | - Fat accumulations will allow the infant to regulate their body temperature more independently. Many infants are |</p>
<table>
<thead>
<tr>
<th>36 weeks gestation</th>
<th>developed</th>
<th>able to be in an open crib.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 weeks premature</td>
<td>-Typical size is about 6 lbs. and 20 ¾ total in. long. Lung development typically begins at the end of this week.</td>
<td>-The infant is more able to handle “normal” stimuli without becoming over stimulated. Stimuli should still be modulated, but can be presented in increments. All organs are fully developed (except the lungs). The kidneys and liver are fully functioning. The liver begins to produce waste products.</td>
</tr>
</tbody>
</table>

The information on pages 37 through 39 was obtained and adapted from:

3) Pregnancy.org
Recommended Reference Material: Fetal Development


- www.marchofdimes.com
## DEVELOPMENTAL STAGES: TYPICAL INFANT DEVELOPMENT

<table>
<thead>
<tr>
<th>Corrected Age</th>
<th>Skills: Prone and Supine</th>
<th>Skills: Sitting and Quadruped</th>
<th>Skills: Standing and Mobility</th>
<th><em>Skills: Reach, Grasp, and Object Release</em></th>
<th><em>Skills: Fine Motor Dexterity, In-Hand Manipulation, and Bilateral Hand Use</em></th>
<th><strong>Cognitive Skills</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2-4 months</strong></td>
<td><em>0-2 months</em>*</td>
<td><strong>0-6 months</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prone: Weight bears primarily through forearms and lower chest. Able to lift head to 90°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supine: Able to hold head in midline. In later stage, may flex neck to keep head and shoulders aligned when being pulled into a sitting position.</td>
<td>Sitting: Unable to sit without support. When in sitting, back is rounded and extensor activity is occasional.</td>
<td>Standing: When held in standing position, the stepping reflex occurs.</td>
<td>Reach: Unable to reach Grasp: Strong palmar grasp reflex. Able to visually attend to hands. Object Release: Able to put hands in mouth. Typically holds hands in a fisted position.</td>
<td>See below for list of these skills starting at 2-4 months.</td>
<td>Overall: Able to understand simple cause and effect. Learns repetitive behaviors in order to obtain results (thumb sucking for soothing, shaking toys for noise). Becomes very interested in the environment. Recognizes familiar people and places. Awake, active, and alert for increased time periods.</td>
<td></td>
</tr>
<tr>
<td><em>0-2 months</em>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4-6 months</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prone: Extends back and neck while propping on hands. Shifts weight from side to side and from upper to lower trunk.</td>
<td>Sitting: May sit independently for brief time periods, requires front and side support.</td>
<td>Standing: Able to weight bear partially when placed in standing. Mobility: Able to roll from prone to supine and supine to prone. Able to pivot when in prone.</td>
<td>Reach: Able to begin reaching for objects, with poor motor control. Visually attends to hands. Grasp: Strong palmar grasp reflex. Able to hold onto objects when placed in hands for a brief period. Full active range of motion is developed in hands and fingers. Unable to grasp objects</td>
<td>Overall: Able to grasp object when placed in hand. Hands frequently fisted together. Fine motor dexterity, in-hand manipulation, and bilateral hand use are not yet developed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Range</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8 months</td>
<td>Does not enjoy extended periods of play-time in either prone or supine positions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>4-8 months</em>*</td>
<td>Sitting: Able to sit independently, back fully extended. Able to use hands bilaterally. Quadruped: Able to move from sitting to quadruped position easily. May begin scooting or crawling in this stage.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6-12 months</strong></td>
<td>Standing: Able to weight bear fully when in a supported standing position. May be able to take a few steps with hands being held. Mobility: May begin scooting or crawling. May be able to take a few steps with hands being held. Reach: Easily reaches for objects. Able to bring objects and hands to mouth. Grasp: Palmar grasp reflex becomes weak. Able to pick up and hold large (I&quot;) objects using ulnar, palmar, and fisted grasps. Able to pick up tiny objects using a raking motion and scissor grasp. Can bilaterally hold large objects. Able to shake a rattle. Object Release: Able to bring objects from hand to hand. Dexterity: Uses a raking motion or scissor grasp to pick up smaller objects. In-hand: Unable to manipulate objects in hand. Bilateral Hand: Able to hold larger objects (i.e. toy, bottle) with both hands with uncontrolled motion. Able to bring hands and objects to mouth. Overall: Able to coordinate a plan to accomplish a goal (ex: use a stick to pull a toy to them). Initiates motor actions and sounds and is able to use objects for purposeful actions (ex: spoon for eating). Responds to name. Able to respond to simple requests.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Object Release: Hands are typically fisted and clasped together.
<table>
<thead>
<tr>
<th>Age</th>
<th>Sitting</th>
<th>Standing</th>
<th>Reach:</th>
<th>Dexterity:</th>
<th>Object Release:</th>
<th>Mobility:</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-10 months</td>
<td>See 6-8 month</td>
<td>Sitting position using stable objects.</td>
<td>Voluntarily reach for objects in any plane.</td>
<td>Uses pincer grasp to pick up small objects and is able to feed self finger foods</td>
<td>Voluntarily releases objects i.e. throw, bang, pour/dump out</td>
<td>Able to walk with at least one hand being held.</td>
<td>See above for cognitive skills between 8-12 months.</td>
</tr>
<tr>
<td>*8-12 months</td>
<td>*6-8 month</td>
<td>Quadruped: Crawls independently.</td>
<td>Grasp: Palmar grasp reflex starts to dissipate. Typically uses a gross fisted grasp with the radial side of the hand for large objects. Has a pincer grasp for smaller objects. Able to transfer objects bilaterally.</td>
<td><strong>In-hand:</strong> Does not yet demonstrate these abilities</td>
<td><strong>Bilateral Hand Use:</strong> Able to transfer objects from hand to hand with controlled movements. Uses bilateral hands to pick up and drop objects</td>
<td>Uses pincer grasp for hand to hand with smaller objects. Able to transfer objects with control.</td>
<td></td>
</tr>
<tr>
<td>10-12 months</td>
<td>See 6-8 month</td>
<td><code>Standing:</code> Able to stand independently.</td>
<td>Reach: Controlled and used functionally.</td>
<td>Dexterity: uses pincer grasp to pick up small objects with control.</td>
<td><strong>Object Release:</strong> Able to release objects with control.</td>
<td><strong>Mobility:</strong> May be able to walk independently. Walks well with at least one hand held, or while pushing a toy.</td>
<td></td>
</tr>
<tr>
<td>*1-2 years</td>
<td>*8-10 month</td>
<td><code>Reach:</code></td>
<td>Grasp: Uses radial palmar grasp for larger objects, pronated finger grasp for round/cylinder objects</td>
<td><strong>In-hand:</strong> Able to move objects from fingers to palm</td>
<td><strong>Bilateral Hand Use:</strong> able to use both hands together to perform functional tasks (ex: feeding, play, carrying)</td>
<td>Displays memory (knows routines, where objects are stored). Language emerges. Object permanence is fully developed.</td>
<td></td>
</tr>
</tbody>
</table>

The information on pages 41 through 43 was obtained and adapted from:

3) [http://www.babybuilders.com](http://www.babybuilders.com), 2007
Recommended Reference Material: Typical Infant Development


INFANT STATES

Infants, born prematurely, have their own way of communicating with their parents and the medical team. This is often done through facial expressions and movements. When working with the infant and their family, it is important that you learn the various states and what they mean. Once you learn the states, you will be able to educate the parents on the different types of states so that they will be able to meet the needs of their infant more effectively.

Listed below are types of infant states that you may observe when working with these infants. This information explains what the infant may exhibit in each state.
Sleep - Awake States

1) Deep Sleep
   - Breathing is regulated
   - Eyes do not move under the eyelids
   - Facial expressions are relaxed
   - Body movements are not spontaneous
   - Limited body tremors and jerky movements

2) Light Sleep
   (unorganized state)
   - Observable eye movement under eye lid
   - Activity level is low
   - Disorganized movements
   - Irregular breathing
   - Infant makes sucking movements, whimpers, makes facial expressions, and startles easily

   (organized state)
   - Responds to internal stimuli
   - Less movements than in the unorganized state
   - May smile or sigh occasionally

3) Transitional Sleep
   - Infant is drowsy
   - Fluttering of the eye lids
   - Eyes may open and close
     - If eyes are open they may look glossy
   - Blinking is exaggerated
   - Infant may make whimpering noises, sucking movements, startles, and facial expressions
   - Fussy
4) **Quiet Alert**  
(unorganized state)  
- Motor activity is limited  
- Eyes may be:  
  - Partially opened  
  - Open and then close  
  - Wide Open “Hyperalert”  
- Looks past an object rather than directly at it  
- May be unable to break away from a stimulus  

(organized state)  
- Optimal time to interact with the infant  
- Eyes are bright and shiny  
- Motor activity is minimal  
- Focuses on an object and is able to process various stimuli

5) **Active Alert**  
- Eyes may be opened or closed  
  - Even though the eyes may be closed, they may be aroused and fully awake  
- Full motor activity  
- May have facial expressions of discomfort  
- Not crying, but fussy

6) **Crying**  
(unorganized state)  
- Crying is intense, but the sound is weak and strained  
- Grimace on face  

(organized state)  
- Rhythmic intense loud crying
Additional Considerations

Sleep States

- Infant is difficult to arouse
- Infant will not breast feed or bottle feed
- Unable to respond to the environment
- Heart rate decrease and may set off the heart rate alarms, which creates extra stimulation by the medical team
- The infant is able to conserve energy, grow, and maintain physiological homeostasis during this state
- Oxygen states are decreased and more inconsistent

Alert States

- Infant may return to sleep state if left alone
- Quiet talking and slow calm stimulation may encourage the infant to move into the quiet alert state
- Best state for parent interaction and sensory stimulation
- Infant may not be able to fully attend to the parents due to excessive environmental stimulation
- Crying is a way for the infant to express that they are over stimulated and may be stressed
Stress Signs

Infants born prematurely often become overwhelmed and stressed by the environment and medical staff. In order to understand if the infant is stressed, it is important that you understand the different types of stress signs the infant may exhibit. Below is a list of the different systems affected and how the infant communicates that they are stressed.

Autonomic Stress Signs
- Changes in body color (pale/flushed)
- Vital signs may increase or decrease in: heart rate, blood pressure, respiratory rate, oxygen levels
- Visceral reactions (gagging, hiccups, diarrhea)
- Sneezing
- Yawning

Motor Stress Signs
- Hypotonia
- Flailing movements
- Splaying of the fingers
- Hyperextension of the extremities (Arching of the back, saluting, airplane)

State Stress Signs
- Diffuse state of sleep (Twitching, grimacing)
- Eyes appear glossy
- Lack of eye contact
- Staring off
- May appear panicked
- Irritable

Attention/Interaction Stress Signs
- Unable to socially interact
**Self Regulatory Behaviors**

Self regulatory behaviors allow the infant to tune out the overwhelming sensory input that is causing them stress. This enables the infant to return to a quite calm alert state or sleep state. Often times these behaviors will reflect the infant’s ability to cope and avoid situations they are unable to process. Self regulating behaviors may include:

- Change in their posture
- Brings their hand to their mouth
- Grasping
- Sucking
- Attends to visual stimulation
- Clasps their hands
Infant Cues: When to Interact with the Infant

The infant will display cues that indicate a readiness to interact with their parents and medical staff. Once you understand these cues, you will be able to educate the parents on the meaning and indication of each cue.

It is important to remember that although these cues indicate that the infant is ready to interact, they may need breaks and time to absorb and process the new sensory information.

Interaction Cues
- Sticking the tongue out
- Ooh Face (the mouth forms an “O”)
- When their hand is on their face
- Cooing
- When the infant is searching for something to suck on
- Grasping for an object
- Holding their hands together
- Pushing their feet on the isolette

The information on pages 45 through 51 was obtained and adapted from:
3) www.marchofdimes.com
Recommended Reference Material: Infant States

- www.marchofdimes.com
<table>
<thead>
<tr>
<th>Assessment Name</th>
<th>Author</th>
<th>Key Components</th>
<th>Benefits</th>
<th>Challenges</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peabody Developmental Motor Scales 2 (PDMS-2)</td>
<td>Folio, M.R., and Fewell, R.R.</td>
<td>Purpose: to assess the fine and gross motor abilities of infants and children. Age: birth to 5 yrs. Time: 45-60 minutes Format: motor performance task administered individually. Norms: national representation of 2,000+ children.</td>
<td>Six subtests to assess various components of motor skills: reflexes, stationarity, locomotion, object manipulation, grasping, visual-motor integration. Provides remediation strategies when deficits in any of the subtests are noted. Detailed instructions are provided to ensure proper administration.</td>
<td>Controversy over the validity of using corrected age.</td>
<td>The test should be performed in the infant's natural environment with minimal distractions to ensure accurate results.</td>
</tr>
<tr>
<td>Neonatal Behavioral Assessment Scale (NBAS)</td>
<td>Dr. T. Berry Brazelton and colleagues</td>
<td>Purpose: to determine the meaning behind the behaviors exhibited by the infant. Age: birth to 2 mo. Time: untimed Format: observation by a skilled therapist. Norms: unknown.</td>
<td>Looks at the capabilities of the infant through behavioral cues. Based on 28 behavioral and 18 reflex patterns to determine function in various areas. Assumes that infants are capable and respond to their environment through behavior. The scales are individualized and look at each infant uniquely.</td>
<td>Assumes that the infant has had 9 months to gain capabilities and use behavior in a controlled manner. The assessment does not produce scores. It assesses the meaning of the infant's behavior. The assessment is subjective to the administrator's interpretation.</td>
<td>The assessment determines the areas in which the infant may require extra support in order to thrive.</td>
</tr>
<tr>
<td>Alberta Infant Motor Scales (AIMS)</td>
<td>Piper, M.C., and Darrah, J.</td>
<td>Purpose: Measures the motor development of infants. Age: birth to 18 mo. Time: variable</td>
<td>Provides results based on the infant's performance. Assesses the infant's maturation of motor skills</td>
<td>The infant's medical conditions and/or equipment may interfere with assessing the infant in various</td>
<td>Evaluates the infant's motor performance overtime. Assessed in supine.</td>
</tr>
</tbody>
</table>

53
<table>
<thead>
<tr>
<th>Test</th>
<th>Author(s)</th>
<th>Format</th>
<th>Time</th>
<th>Norms</th>
<th>Purpose</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compares the infant’s results to other infants in the same age range. In the early stages of development, infants grow at varying degrees.</td>
<td>Assesses basic and complex tasks.</td>
</tr>
<tr>
<td>Denver Developmental Screening Test</td>
<td>Frankenberg, W.K., Dodds, J., Archer, P., Shapiro, H., and Bresnick, B.</td>
<td>interaction between infant and therapist and skilled observation by administrator.</td>
<td>variable</td>
<td>standardized and norm-referenced</td>
<td>Detects developmental delays. Age: birth to 6 yrs.</td>
<td>Assesses personal/social, fine motor adaptive, language, and gross motor. Three trials are allowed in to complete each item.</td>
</tr>
<tr>
<td></td>
<td>Zeitlin, S., Williamson, G.G., and Szczepanski, M.</td>
<td>Interactive between infant and administrator</td>
<td>variable</td>
<td>standardized and norm-referenced</td>
<td></td>
<td>Assesses organization of sensorimotor skills and reactive behaviors.</td>
</tr>
<tr>
<td></td>
<td>Furuno, S., O'Reilly.K.A., Hosaka.</td>
<td>Interactive between infant and administrator; skilled observation by administrator.</td>
<td>variable</td>
<td>unknown</td>
<td>Parents are considered an important part of the</td>
<td>Assists in determining appropriate environmental modifications.</td>
</tr>
</tbody>
</table>

54
<table>
<thead>
<tr>
<th>Test Name</th>
<th>Author(s)</th>
<th>Purpose</th>
<th>Format</th>
<th>Norms</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infant/Toddler Sensory Profile</strong></td>
<td>Dunn, W.</td>
<td>Assesses how the infant process sensory stimuli and how stimuli impacts behavior.</td>
<td>Caregiver questionnaire.</td>
<td>Unknown</td>
<td>Provides an age range which reveals when various skills should emerge.</td>
</tr>
<tr>
<td><strong>Movement Assessment for Infants</strong></td>
<td>Chandler, L., Andrews, M., Swanson, M., and Larson, A.</td>
<td>Distinguishes between developmental delays and differences in patterns of development.</td>
<td>Interaction between infant and administrator.</td>
<td>Unknown</td>
<td>Assists with establishing rapport with the infant’s parents.</td>
</tr>
</tbody>
</table>

The information on pages 53 through 55 was obtained and adapted from:

2. [SlideShare](http://www.kaimh.org/slides/help/sld002.htm), 2002
Recommended Reference Material: Evaluations & Assessments


- http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED237235&ERICExtSearch_SearchType_0=no&accno=ED237235


CARE PLAN & INTERVENTIONS

It is recommended that the OT attend continuing education courses and gain additional training in the provision of infant interventions to ensure optimal care.

We have provided you introductory intervention strategies and resources which coincide with the roles you now possess as an occupational therapist in a Level II nursery. Establishing the care plan and developing interventions depends upon many variables. The infant’s medical status must be considered prior to the implementation of any intervention strategies.

The intervention strategies provided are in a simple format so they can be easily adapted and expanded to meet the unique needs of each infant. The interventions are not presented in a certain order, as the infant’s needs will determine when each intervention is appropriate for implementation.

The key to providing the most appropriate and quality interventions lies in the therapists’ clinical judgment and planning techniques. Educating the parents on the infant’s needs is also critical, so they can provide quality care to their infant while feeling comfortable and confident.
Environmental Adaptations

Goal/Purpose: Infants born prematurely are unable to integrate the sensory stimuli that occurs within their environment. By decreasing the amount of light and noise around the infant, their central nervous system will be able to process other stimulus within the environment with greater ease.

Adapting the environment has the following benefits:

1. Decreased stress level
2. Their sleep/awake cycles will begin to develop
3. Increased weight gain
4. Overall physiological status begins to increase.

As the infant becomes older and their sensory system begins to mature, their environment will be able to be similar to that of other infants.

Supplies:

Lighting: Shades over windows, bed-side lamps, isolette covers and eye masks for the infant's face.

Noise Levels: Isolette covers, lights/vibration on phones, and limit/eliminate overhead announcements.
Resources for supplies:


**Precautions:** When introducing more sensory stimuli, it is important to monitor the infant’s cues and physiological status. The infant may become overwhelmed by the new sensory input. You will need to make the necessary adaptations to meet the infant’s needs. Adaptation ideas can be found in Section 1 on pages 12 through 13.

**Description:** The infant’s gestational age will determine how many adaptations are needed. Each infant develops at different levels and will need different types of adjustments so that they do not become over stimulated. As the infant’s ability to integrate the environment around them improves, you will be able to slowly increase the amount of light and noise within the environment to simulate and prepare him/her for their home environment.
Parent Involvement: The parents will need to be educated and trained on adapting sensory stimuli and how they can create an environment to meet the needs of their new infant. While the infant is in the hospital, the parents will be able to follow the guidelines that are recommended to promote a healthy development.

Bringing Home Baby (use after discharge): Once the infant is discharged home, the parents should follow similar environmental adaptations used at the hospital. The parents may begin to introduce new sensory stimulus as the infant’s central nervous system begins to develop. The parents will be able to confidently introduce new sensory input through you educating them and providing them with resource tips to gather more information.

Resources for Parents:


www.marchofdimes.com

Information on pages 58 through 60 was obtained and adapted from:
Images of Environmental Adaptation Interventions

Left image: Machine used for reading vitals. This machine often creates loud noises within the nursery environment and is only one of the several machines used.

Right image: An infant in the isolette. In this picture you can see the tubes attached from his body to machines. The picture also shows several materials used to prevent sores and promote a healthy sensory diet.

Left image: An infant placed on a blanket made of soft material. This soft blanket is similar to sheep skin used within nursery settings for the prevention of sores and sensory integration.
Stress Signs

Goal/Purpose: The interventions listed below are some examples that may help the infant calm down when he/she becomes stressed. Each infant has unique needs and each of these techniques may not work for everyone. Once you begin working with the infant, you will be able to understand what interventions decrease the infant's stress level.

Supplies: Blankets for swaddling.

Precautions: You must be aware of the various states and cues in order to meet each infant's needs. If the infant becomes overwhelmed at any time you need to stop and allow time for the infant to reach the calm alert state before continuing with any type of interaction or intervention.

Description:

Autonomic Stress Sign
- Environment
  - Decrease the lighting
  - Turn off the alarms near beds as soon as they go off
  - Use quiet or private rooms when the infant is stressed
  - Move the infant away from any phone, sinks, and medical stations

- Amount of handling of the infant needs to be decreased
  - When repositioning, use slow and gentle movements
  - If the parents want to carry their baby, explain to them the stress signs and then have them place one finger in the infant's palm to help calm them
• Position the infant in prone or side-lying with their arms flexed and forward (encourages the infant to bring their hand to their mouth which is a self regulatory behavior)
• Swaddle the infant with their arms flexed or place a light blanket over them and then roll diapers to tuck around them to encourage flexion

Motor Stress Signs
• Position the infant in prone or side-lying
• Swaddle the infant
• When handling, hold the infants extremities in flexion, close to the body until he/she becomes calm

State Stress Signs
• Provide all infant care at one time instead of doing tasks with them throughout a period of time, while providing them rest as needed (i.e. change diaper, weighing, feeding)
• Encourage the medical staff to assign primary caregivers for each infant
• Daily schedule
  - Plan the daily routine to meet the needs of the infant
  - Individualize care to meet the specific needs of the infant
• Position the infant in side-lying or prone
• Evaluate the environment from the infants view point (is there too much stuff around the area)

Attention/Interaction Stress Signs
• Acknowledge and respect the infant’s cues and stress signs
• Provide only one type of stimulation at one time (i.e. speaking to the infant and touching them at the same time may be overwhelming)

Self Regulating Behavior
• Positioning needs to be in prone or side-lying
• Hold the infant’s hand
• Provide the infant with something to suck on (i.e. pacifier)
• Encourage parents to place their finger in the infants palm

63
• Make necessary modifications to the environment
• Allow the infant time alone when becoming stressed, first ensuring their O2 status and heart rate are regulated and safe

**Parent Involvement:** The parents will be the infant’s primary caregiver once discharged from the hospital. In order for them to provide the utmost care, you need to educate them on the different states and cues. Also, explain to the parents when the best time is for them to give their infant a bath and what will help to calm their infant when they become stressed.

For pictures to help identify the infant’s cues please refer to the *Coming Together* Section of the product for a handout to present to the parents.

**Bringing Home Baby (use after discharge):** The parents will be able to use each technique that has been explained to them when their infant returns home. When training the parents on how to care for their infant during the various cues, remind them that they are not just for hospital use. The parents will continue to use these techniques to help calm the infant in their new environment.

---

Information on pages 62 through 64 was obtained and adapted from:
3) www.marchofdimes.com
Images of Stress Sign Interventions

Left image: An infant positioned to decrease motor stress signs. The infant was swaddled and placed in side-lying, which promotes the limbs in mid-line and assists the infant in organizing his behaviors.

Right image: An infant’s attention stress signs being acknowledged. The infant is being touched without being talked to simultaneously, as it is important to minimize the amount of stimulation the infant receives at one time.

Left image: An infant participating in self-regulating activities. The infant is sucking on a pacifier and rubbing his face to promote self-regulation.
Kangaroo Care

Goal/Purpose: Kangaroo care first began in 1980’s in Bogota, Columbia to increase and maintain the infants’ body temperature prior to incubators. This technique is now used to increase parent-infant bond, increase weight gain and temperature regulation, decrease stress signs, promote earlier discharge from the hospital, decrease agitation and random motor activity, increase breast feeding, and improve the infant’s overall physiological status.

Supplies: Diaper for the infant, a blanket or shirt for the parent, a comfortable chair, and a quiet environment.

Precautions: Watch the infant’s cues and stress signs. Stop the activity if the infant’s cues display agitation or discomfort. Also stop the activity if the infant’s oxygen saturation levels drop or there are other changes in their physiological status. The infant cannot be on a ventilator to participate in kangaroo care.

Description: The infant, wearing only a diaper, is placed directly on the caregiver’s bare skin (i.e. chest). The infant may be covered with a blanket or lay directly inside the caregiver’s shirt. The infant needs to be in a calm
state for the most effective experience. Kangaroo care is provided to premature infants of all ages.

**Parent Involvement:** Not only is Kangaroo Care beneficial for the infant, but the parents as well. This technique encourages maternal milk production, promotes awareness of the infant’s cues, parent-infant bond, and confidence in the ability to care for their infant. Parents need to be educated and trained in how to perform this technique throughout the infant’s stay in the hospital.

**Bringing Home Baby (use after discharge):** Once the infant is discharged home, the parents will have an understanding of how to care for their infant. The parents will be able to continue this technique at home to encourage a stronger attachment and promote a healthy development for their newborn.

Information on pages 66 through 67 was obtained and adapted from:
4) www.marchofdimes.com
Images of Kangaroo Care Interventions

Left image: An infant participating in kangaroo care with her father 3 days after birth. This picture displays the calming effects of kangaroo care.

Right image: An infant and his mother bonding during kangaroo care. This intervention technique promotes the parent-infant bond.

Left image: An infant and his father participating in kangaroo care. Attachment is promoted through this care practice.
Infant Massage

**Goal/Purpose:** Massage facilitates an increase in weight gain and motor function, improves alertness, decreases stress levels, shortens length of stay in the hospital, and increases the parent-infant bond. Infant massage is also a way for the infant to begin to integrate sensory stimuli through the tactile system.

**Supplies:** Massage oil (i.e. sunflower oil or a non-scented body massage oil) or non-scented lotion, raised table, blanket, and a warm and quiet environment.

**Precautions:**

Be aware of the infant’s cues and stress signs. Stop the massage if the infant’s cue changes from the quiet alert state to an active alert or crying state. Stop the massage if the infant’s oxygen saturation levels drop below their typical level or if there is a change in their physiological status such as: rise in temperature, blood pressure, and/or skin color. Do not complete massage to infants younger than 32 weeks, as they are not physiologically stable. Before beginning any type of massage it is important to ensure that the infant’s tactile system is ready for the new stimuli. Begin by simply placing your hand gently on the infant and resting it on their stomach or
back. This will assist the infant in becoming familiar with the tactile stimulus.

**Description:** There are various ways to massage an infant born prematurely and additional training about the techniques, precautions, and warning signs should be completed prior to performing any type of massage.

**Prior to massage:**

- The massage should occur during the infant’s quiet alert state.
- Your hands should be warm.
- Use gentle to moderate pressure when massaging the infant. Light pressure is often stressful to the infant and may cause discomfort. You will want to massage the infant so that they can feel it, but it is not overwhelming to them.
- Massage typically lasts 20-30 minutes and should be completed three times a day (i.e. after baths, meals, and before bed times). The infant may not be able to tolerate 20-30 minutes at first. You will need to monitor the infant’s stress signs and stop if the infant becomes stressed.
- Communicate to the infant before the massage so they are aware of your presence.
- The infants should be lying either on the table or in your lap, and may be positioned in prone or supine.
• Begin at the legs and then work up towards the arms
• Use only two or three of your finger tips for the massage.

Specific Massage Techniques:

• Symmetrical Starting Stroke
  - Start at the shoulders or thighs using your hands
    simultaneously gently massage down towards the
    fingers or toes. Always leave one hand on the infant
    when moving your hands back to the top of the body part
    (move one of your hands up and then the other).

• Indian Milking
  - Move your hands away from the heart
  - Increases relaxation and inhibits tone
  - Hold the infants wrist with one hand and then rub the
    arm from the outer side of the shoulder down to the wrist
  - Continue alternating your hands from the shoulder to the
    wrist doing the inner and then the outer part of the arm

• Swedish Milking
  - Towards the heart
  - Used with low tone to increase their arousal
  - Opposite of Indian Milking
Parent Involvement: Educate and train parents on how to perform infant massage. The parents should practice this technique while their infant is in the hospital to encourage the parent-infant bond and attachment.

Bringing Home Baby (use after discharge): Parents will be able to use the massage techniques on their infant once discharged from the hospital. The parents need to be able to understand their infant’s cues and states to ensure that the infant does not become stressed during the massage. The massage techniques will increase the parent-infant bond as well as calm the infant in the new environment.

Information on pages 69 through 72 was obtained and adapted from:
Positioning

Purpose/Goal: Interventions focusing on different positioning techniques promotes neuromotor control, structural alignment, and to improve their physiological status. The primary goal of positioning is to encourage comfort, security, extremity flexion to midline, and decrease the risk of deformities. Furthermore, while the infant experiences different positions, normal movement patterns and muscle movements are facilitated.

Supplies: Positioning interventions can essentially be integrated in almost any environment, with little or several supplies. Typical supplies utilized within these interventions include:

- Infant’s natural bed (isolette, open crib, etc)
- Receiving blanket
- Propping devices (wedge, bolster, pillow, snuggly)

Precautions: The therapist must take into account that the infant has very little control over their movements. The time the infant may be left in the various positions depends on the purpose of the position and the cues the infant is displaying. Positioning times may range from 5 minutes to 1 hour. It is critical to observe the cues of the infant and use clinical judgment to guide your decisions. It is important to position the infant carefully to assist in maintaining the posture without over-stimulating the infant. The
positioning items (blankets, pillows, wedges) can be used to help support the infant in the various postures.

**Description:** The interventions are most successful if completed while the infant is in an "alert" state and is not exhibiting stress signs.

**Supine** - Positioning the infant in supine (on their back) is typical during the early days of life when the infant is unable to cope with frequent handling. When the infant is in supine, care routines can be conducted without having to move the infant excessively. Laying the infant on their back also promotes flexor tone. Adaptations may include: laying the infant in a snuggly and having their legs drape over the rounded edge of the snuggly. A picture of an infant positioned supine in a snuggly is available on page 75.

**Prone:** Placing the infant in a prone position (on their stomach) is often utilized for infants with low oxygen saturation levels. However, this position is also effective to promote flexor tone, facilitate beginning stages of head control, and allow weight-bearing on their hands and feet (they will often push off the crib surface with hands and feet while in this position). The infant should not be left to sleep in a prone position, as
recent studies have linked prone sleeping to increased risk of Sudden Infant Death Syndrome (SIDS).

*Side Lying:* This position allows the infant the most interaction with the surrounding environment. While on the side, the infant is able to see out into the room and take in the sensory stimuli. Effective uses for this position include: calming the infant when displaying stress signs (arching of the back), feeding and digestion, and facilitating hand-to-mouth movements.

*Parent Involvement:* Handling infants in such a small, vulnerable state can be overwhelming and even frightening for many parents. It is important to include them in positioning their infant early on in the treatment process. Educate the parents on how to properly touch and move their infant and encourage them to participate in positioning interventions as often as possible.

*Bringing Home Baby (use after discharge):* Educating the parents on the techniques and uses of the different positions will facilitate proper use upon discharge.

Images of Positioning Interventions

Left image: An infant positioned in supine. The picture displays the infant placed in a Snuggly to promote bringing the limbs in close to the body.

Right image: An infant positioned in prone. This position promotes flexor tone and increased oxygen saturation levels.

Left image: An infant in the side-lying position. This picture and the picture of the infant in prone were taken within 2 hours of each other. This displays the importance of changing the infant’s position often.
Bathing

**Purpose/Goal:** Although bathing is a basic care need, it is also effective in:

- soothing the infant;
- promoting learned routines and;
- facilitates bonding.

Bathing can also be utilized as a quiet activity for the infant and helps with digestion and muscle relaxation.

**Supplies:** It is critical that all supplies be gathered and set close by the bathing station prior to the start of the intervention. The necessary supplies include:

- Baby bath/warm water
- Receiving blankets (2-4)
- Shampoo/baby wash
- Wash cloth (2)
- Towel
- Diaper
- Lotion
- Clothes

**Precautions:** Be sure the infant’s skin does not become irritated by any of the supplies. It is also essential to ensure that the water temperature and placement of the positioning blankets increase the comfort of the infant.

While moving quickly is important to ensure the infant does not become cold, bath time should be soothing and enjoyable.

**Description:** Fold a receiving blanket in-half and lay it on the bottom of the baby bath-tub. Fill the bath-tub with warm water. Roll two receiving blankets and place them on either side of the bath-tub. Undress the infant.
and loosely swaddle them in a receiving blanket and gently place them in the bath-tub. Wet the wash cloth and apply a tiny bit of soap. Start at the infant’s feet and slowly unwrap each body part as you wash, trying to recover it when completed. Wash the infant’s face with a clean wash cloth, so soap does not get in the eyes. Wash the infant’s hair last (when the head is wet, everything gets colder more quickly). Remove the swaddling blanket and ensure that the infant is completely rinsed off. Remove the infant directly from the bath-tub and place gently into a warm towel. Throughout the bathing, rearrange the blankets as necessary so the infant is supported and comfortable.

**Parent Involvement:** Parents can assist in bathing as often as they are able. Teaching strategies on how to keep the infant supported in the bath-tub is most effective to promote a calm state for both the parents and the infant.

**Bringing Home Baby (use after discharge):** Through parent involvement and education while the infant is hospitalized, the parent will feel more comfortable and at ease performing this daily care routine once the infant is home.
Left image: An infant receiving a bath. The picture displays blankets being used for positioning to ensure the infant's comfort.
Feeding

Goal/Purpose: Infants do not possess the “suck, swallow, breath” response necessary to nipple feed independently until approximately 35 weeks gestation. Through the implementation of “feeding” interventions, the infant can practice different steps of the feeding process until they can all be integrated into independent feeding routines. The infant’s need to suck, in order to be nourished, is stimulated through non-nutritive sucking, non-nutritive sucking during gavage feeding, and routine breast/bottle sucking while gavage feeding.

Supplies: In order to complete feeding techniques the necessary supplies include:
- Pacifier
- Breast/bottle
- Gavage supplies (tube, breast milk/formula)
- Chair to sit in while the infant is eating

Precautions: Prior to completing the feeding interventions, be sure to check the infant’s states to ensure it is safe for their emotional well-being to be challenged. Also, make sure the infant does not become overwhelmed or display stress signs before or after the feeding interventions occur. It is also critical to ensure that the infant is not on a holding schedule prior to inviting the parents to “feed” the infant according to their schedule.
**Description:**

*Non-nutritive sucking:* Allow the infant to suck on a pacifier during "quiet-alert" states. This promotes the sucking response, while also building the strength and endurance to suck for extended periods of time. Different stages of pacifiers may be used to increase the level of difficulty. As the infant continues to use a pacifier, they will gain more control over it as their oral muscles grow stronger. Once the infant is able to suck on a pacifier in a controlled motion for extended periods of time, they may be ready to begin short independent feedings.

*Non-nutritive Sucking while Gavage Feeding:* During the infant’s regularly scheduled gavage feeding times, have them suck on a pacifier. As the infant becomes familiar with this routine, they will learn that sucking equates to being nourished.

*Non-nutritive sucking while Breast/Bottle Feeding:* As the infant’s “suck, swallow, breath” response develops, integrating activities that encourage all three together are important. During the infant’s typical gavage feeding, have them breast/bottle feed (whatever they will be doing most regularly upon discharge) simultaneously. The infant will still be getting the necessary nutrients due to the gavage feeding, but will be exposed to
swallowing as they consume the small amount they receive from the breast/bottle.

**Parent Involvement:** Including the parents in feeding interventions will promote bonding and encourage routines once the infant is discharged. While in the hospital, the infant will be on a strict feeding schedule. In order to include the parents, give them a copy of the schedule and allow them to designate the times they are able to be present during feeding times. While they are present, have them hold the infant as if they were feeding them without the tube. It is most effective when the environment can be as “natural” as possible, with comfortable chairs and a non-chaotic atmosphere.

**Bringing Home Baby (use after discharge):** The infant will typically be able to feed from breast or bottle independently before they are discharged home. Routines are still important to prevent the infant from becoming too overwhelmed secondary to all of the changes. However, encourage the parents to not be on too strict of a schedule and follow the cues of the infant. The infant will let them know when they are ready to eat.

Information on pages 80 through 82 was obtained and adapted from:
Images of Feeding Interventions

Left image: The machine used for gavage feeding. Machines are not used with all infants, but are often used in cases where feeding routines are more difficult for the infant or the infant must consume an exact amount.

Right image: An infant participating in "non-nutritive sucking" in conjunction with gavage feeding. This technique stimulates the infant and allows her to gain the understanding that sucking equates to being nourished.

Left image: An infant participating in "nutritive sucking." Infants are typically able to participate in this feeding technique at 35 weeks.
SECTION 3

PARENT, INFANT, THERAPIST:

COMING TOGETHER
SECTION OVERVIEW

*Parent, Infant, Therapist: Coming Together* focuses on ensuring that the therapist has taken all necessary measures to prepare the infant and their parents for discharge. This section includes:

1) Discharge Criteria
   *Discharge Checklist*
   In order to ensure that you have prepared and educated the parents on the infant’s occupational needs, a checklist has been provided to assist you in effectively discharging the infant from your services.

2) Parent Education
   *Educational Handouts*
   Supplying the parents with educational handouts supplements the involvement they have had in their infant’s care while in a Level II Nursery. Having information to refer to when they are no longer surrounded by the support system of the hospital personnel eases the transition of being the primary care provider for their infant. Handouts in this section include:
   - Coping Strategies
   - Safety and Health Care Tips
   - Preparing the Home
   - Infant Cues
   - Lifting Techniques
   - Breast-feeding Picture Tips
   - Resource List
DISCHARGE CRITERIA

Occupational Therapy Checklist

This checklist serves as a guideline to ensure preparation of the infant and parent prior to discharge.

Infant Needs:
- Behavioral stability
- Organization of sleep/wake cycles
- Independent feeding (every 2-3 hours)
- Temperature regulation
- Sleep in an open crib
- Able to handle sensory stimuli without adverse medical affects
- Meet all medical discharge criteria

Parent Needs:
- Room in with infant (1-2 nights)
- Direct involvement with care routine/interventions of infant
- Meetings with medical team members and referral sources
- Overview of infant’s developmental strengths and limitations
- Home preparation
- Follow-up appointments
- Overview of routine/schedule
- Medication list (schedule/dosage)
- Car-seat installation/inspection
- Resource list and informational hand-outs
PARENT EDUCATION

The following hand-outs are intended to assist in the parent’s transition to being the primary caregiver for their infant. After weeks, or even months, of being surrounded by medical experts who care for premature infants on a daily basis, the thought of taking their infant home is both exciting and intimidating. It is intended that each family receive a folder with copies of the hand-outs and any additional information they may benefit from. Through the provision of written information, the parents will be able to refer to the handouts as needed.

It is recommended that the OT provide not only these handouts to the parents, but to seek out additional resources and education material as deemed necessary. The provided handouts will set the course for supporting the parents and infants after discharge.
Coping Strategies

The following are ideas to help you cope with stress. It is important to take time for yourself, even if it is just for 20 minutes a few times a day:

- Go for a walk
- Read
- Go hiking
- Take a hot bath
- Eat your favorite ice cream
- Play a game with friends or family
- Stretch
- Ask for help when needed
- Smile
- Look at old photos
- Play with a family pet
- Journal about your thoughts or feelings
- Exercise
- Watch television
- Listen to music
- Go shopping
- Sit in a park
- Talk on the phone
- Make a to-do list
- Take a nap
• Go on a picnic
• Go on a scenic drive
• Clean your house
• Watch a sporting event
• Sing a song
• Join a support group
• Become educated on your infants status
• Try to establish a routine
• Write a letter to your infant about how much you love and care about them
• Bake a cake
Health Tips for Parents

Infants born prematurely are often born with low immune systems due to not fully developing while inside the womb. As a parent, it is important that you understand some health precautions when you are with your baby in the hospital, as well as at home.

While in the Hospital:

- Always wash your hand before handling your baby.
- If you are not feeling well, please stay home for the day.
- Have additional visitors wash their hands and not visit if they are not well.
- Learn more about the medications your baby will continue taking at home.
- Ask questions when you are unsure about a type of treatment your baby is receiving. Write down questions as you think of them. Write down the answers as well.
- Learn about the various types of medical equipment to better understand what your baby is going through.
- Take good care of yourself. You cannot be the best parent you want to be unless you are in good physical and emotional health.
Once at Home:

- Wash your hands frequently and before touching/carrying your baby.
- Tell guests to wash their hands prior to holding your baby.
- Follow through with all doctors appointments.
- Remove extra bedding from your infant’s bed to prevent Sudden Infant Death Syndrome (SIDS). This is when an infant under one year of age dies unexpectedly.
- Join a support group for emotional support from other parents who have experienced what you may be going through.
- Once your baby has been discharged home, it is important to have one developmental screening at a local Child Development Center before your baby has reached his/her second birthday. This makes sure that your baby is developing as expected.
- Accept help from others. It is difficult to let others help you care for your baby and to do tasks around the house, but you will find that accepting this help is important to better care for your baby and yourself.
Preparing the Home

Discharge planning often begins on the day your baby is admitted to the hospital. As the parent, you will also want to begin preparing for your baby to come home. Taking your baby home from the Level II nursery is a big transition. By having your home prepared, you will be one step closer (and that much more at ease), knowing that you are ready to welcome your baby to your home. Below are tips to help you get ready for your baby’s home-coming:

1) Prepare the whole family, bringing home a new baby is a transition for every family member. If possible, introduce your baby to the immediate family members prior to coming home. If you have pets, you may want to bring home one of the baby’s blankets or toys so they are able to become accustomed to the scent. Be sure to let your doctor know if there are pets at home in case there are any concerns.

2) Prepare a place for the infant. Make the infant his/her own room or space to ease the transition. Having a room where the infant can be away from bright lights and too much noise is helpful when your baby becomes fussy.

3) Get all necessary supplies, including: crib/bassinet, diapers, wipes, receiving blankets, packed diaper bag, clothes (onesies, undershirts, sleepers, 2-3 outfits, socks, hats), towel, wash cloth, pacifier, bottle, thermometer, bath supplies (bath-tub or large baby sponge, bath wash, etc.)

4) Helpful home tips: Premature infants are often more susceptible to germs and viruses. Wash all clothes and blankets in mild detergent (i.e. Dreft) before you use them for the baby. Cleaning the home prior to the
infant’s discharge is the first step in promoting their health. If possible, get an air purifier to lower the risk of the infant getting lung infections. Talk to your doctor about any other concerns they may have for the infant’s health.

5) Install a car seat and have it inspected. Most fire stations will do free inspections.

6) Schedule follow-up appointments. Talk to your pediatrician about specific check-ups times required for your baby (3-days, 2 weeks, 1 month, etc). Talk to the nursery staff about specialty appointments they want you to schedule (hearing, eye doctor, etc).

7) Create a list of questions for the medical team members to ensure you are mentally prepared for this transition. If there is any question you may have about any part of caring for your infant, ask the doctors or nurses. There is no such thing as a “stupid question.” Examples of questions:

- How often should I feed my baby?
- How often should the baby have a wet diaper?
- How often should the baby have a poopy diaper?
- What do I do if the baby throws up?
- What do I do if the baby will not stop crying?
- What if the baby will not eat?
Infant Cues and States

There are two types of states you need to be aware of. The first one is sleep states which include quiet/deep sleep and active or light sleep. The second state is awake states which include: drowsy, quiet alert, active alert, and crying/fussy.

**Sleep State**

During the sleep state, it is best to let your baby rest. Newborns, especially premature newborns need a lot of rest throughout the day.

**Awake State**

The awake states are the best time to do things with your baby. Quiet alert and active alert is when you will want to talk to your baby, feed him/her, give your baby a massage, a bath or, change his/her diaper.

**Quiet Alert**

Your baby will give you cues when they are getting over stimulated or when they are moving out of the quiet alert state. It is important to know your baby's cues and let him/her time to rest when they begin do display signs that mean they are becoming tired or overly stressed.
These signs can include your baby beginning to arch his/her back, splay or salute their fingers (raising and spreading his/her fingers in the air), crying, yawning, “O” face, getting the hiccups, spitting up or gagging, looking away, and/or fall asleep. During this time, you can try to calm your baby by wrapping him/her in a blanket and then holding your baby close to you or putting him/her in the crib so they can self soothe.

Information on pages 94 through 95 was obtained and adapted from:
2) www.marchofdimes.com
Lifting/Handling Techniques

There are several ways that are important for the safety and well-being of both your baby and you. The tiny size of your baby may make you feel nervous or scared. The next several pages include picture guidelines on how to lift and carry your baby in different positions. As the OT, it is critical you explain the terms and motions portrayed in the following images and verify the parents' understanding of the material. Included on all of the images is a place to write special instructions for the parents.

Positions for Carrying a Young Child

Place the child in a curled-up position with shoulders forward and hips flexed. Place your arm behind the child's head — not behind the neck.

Special Instructions

OR

Place the child facing you with legs around your hips. Hold the child under the buttocks.

Special Instructions

OR

Place the child facing you. Place one hand on the child's buttocks and the other hand on the child's back.

Special Instructions

OR
Lifting a Small Child from the Floor — Alternative Method
Moving to Sidelying

Child on Back

Squat down on one knee beside the child.
Place one arm between the child's legs, with the palm of your hand on child's stomach.
Place your other hand behind the child's shoulder.
Roll the child to one side.

Child on Stomach

Place one arm between the child's legs, with your hand on the child's stomach.
Place your other hand under the child's chest.
Roll the child to one side.
Lifting a Small Child from the Floor — Alternative Method (continued)

Lifting

Place one arm between the child's legs, with the palm of your hand on the child's stomach. Place your other hand on the child's shoulder.

Roll the child up and toward you, pressing your hand on the child's stomach so the child bends.

Move your hand from the child's shoulder. Grasp the child's thigh, and bend the child's leg. Lift the child to your lap.

Come to stand.

Special instructions
Place the child sideways in your arms, with one arm around the child's body and the other hand under the child's thighs.

Special Instructions

OR

Hold the child facing away from you. Place one of your arms under the child's leg and hold the child's chest. Place your other hand under the child's buttocks.

Special Instructions

OR

Hold the child over your hip. Place one arm firmly around the child's buttocks. Place the other hand under the child's heel and press upward.

Special Instructions
Breast feeding can be difficult for any new mother, especially after having a baby that is born prematurely. Since your baby was born, you may have been using a nursing pump while at the hospital. Working with a nurse or an occupational therapist on ways to breastfeed your baby before you leave the hospital is important. If you have any other concerns or questions about breast feeding be sure to consult your doctor, nurse, or therapist. The following tips are intended to help you breastfeed:

The first step is to make sure your baby is hungry. You will be able to tell by the cues he/she is showing you such as:

- An alert face (being awake)
- Opening his/her mouth when the side of the his/her mouth or cheek is touched
- Turns his/her head towards the bottle or pacifier nipple

The second Step is to get into a comfortable position that will support your neck and back while you are nursing. Your baby should be placed looking directly at your breast with the rest of his/her body in a straight line. You will want to support your breast with the arm that is nearest to that breast and support the baby with the opposite arm, as shown in the picture.
Support the baby's shoulders and head with the arm that is on the outside of the infant's body. To help hold your breast, you will want to place four of your fingers around the bottom of your breast near your rib cage. Your thumb comes across the breast up towards the nipple.

Place your baby into a position where his/her mouth and nose is level with the nipple. When the baby's mouth opens it should be able to open around the areola (dark area around the nipple).

You will want to wait to bring the baby to the nipple until they have opened their mouth. Sometimes it takes time for the baby to latch on to the nipple so it is important to be patient. Stroking the baby's cheek sometimes helps to open the baby's mouth.
You will know that the infant is in the correct position when their chin is on the lower part of the breast. The nose is close to the breast, but there is a space for the infant to breathe well. The lips will appear to flatten around the nipple and the nipple will appear to move with the baby's sucking. A tingling sensation may occur within your breast while the infant is nursing.

In the beginning, you may breast feed your baby up to 9 - 12 times a day. You will want to switch which breast you are using each time so that the nipple does not become to sore and you equally use milk from each breast.

Information on pages 100 through 102 was obtained and adapted from: www.marchofdimes.com


**Resource List**

Place this sheet on your fridge for easy access. After bringing your baby home, there are probably several different doctors and facilities you will be keeping in contact with. Having the contact information in one place will make things easier for you.

Write the main person/people you get information from at each place (example: the pediatrician’s name and the secretary or head nurses name). Included are the common places you need to contact in the first days/weeks/month your baby is home. There are empty spaces at the bottom of the chart are for you to add other places/people as needed.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Contact Person</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level II Nursery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatrician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Development Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactation Specialist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech Therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

103
Resource List

Following is a list of excellent books to help ease you into your transition of parenthood:


References


http://PSImc.com, 2008
CHAPTER V

SUMMARY

Summary of Purpose

According to Gordon (2003) “nearly half of America’s babies start out their lives in a rural community” (p. 3). Furthermore, research indicates that the provision of care in rural areas is substandard to care in urban/suburban areas due to lack of adequate training and resources secondary to a lower population of infants born prematurely. As stated by Gordon (2003) “such deficiencies in training have less impact in urban and suburban areas, which have seen a proliferation of level II units. Outcomes of infants born in suburban areas are superior to those of neonates born in rural locations” (p 3).

The goal of this scholarly project is to present the case that OT’s possess the knowledge base and skills necessary to provide early intervention to infants born prematurely. Secondary to the specialized nature of OT within Level II nurseries, it is critical that the therapist expand their educational preparation to meet the needs of this unique population. Due to the limited exposure OT’s in Level II Nurseries have with infants born prematurely, a resource guide may facilitate consistency of care between NICU and Level II nurseries and the OT’s comfort level by:

4.) Providing a resource to OT’s, who may provide care in Level II nurseries, as a tool to provide optimum care to infants born prematurely.
5.) Contributing to the consistency of care received between suburban/urban communities and rural facilities via education and/or resources to access additional education.
6.) Providing ideas and resources to strengthen knowledge-base regarding evaluations, treatment design, and implementation while remaining family centered.

**Brief Overview of Project**

The methodology used in the development of *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is as follows:

5. An extensive literature review was conducted (journals, textbooks, databases, and credible websites)
6. The authors took a guided visit to a Neonatal Intensive Care Unit (NICU) and a rural Level II nursery
7. Personal experience in NICU and rural Level II nursery environments inspired the need for a resource guide
8. Discussions with medical professionals within both settings

The theoretical framework used for the development of the resource guide was Knowles' Theory of Andragogy. Andragogy is defined as a method to teach adults (Dictionary.com, 2007). Since the product was intended for occupational therapists, OT’s are the adult learners of this product and eventually their colleagues and parents of infants born prematurely.

Based on the results from the literature review, it was found that OT’s possess a need for resources to be utilized while caring for infants born prematurely in a rural Level II nursery. Further findings from the literature indicated that the needs of the infant, parent, and therapist need to be equally considered in order for care to be most effective (American Occupational Therapy Association, 2006). The specific needs of the infant, parent, and therapist were identified within the literature and addressed within the product portion of the scholarly project. *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* contains three sections designed to meet the needs of the infant, parent, and therapist.
Limitations

Current limitations of the scholarly project are as follows:

1. The resource guide could be expanded upon with more detail.
2. Due to the limited caseloads of infants born prematurely, rural hospitals often focus only on general primary care.
3. The resources necessary to gain competency are largely unavailable within the Wyoming region, making it difficult for OT’s to obtain necessary continuing education courses to stay up-to-date on current trends.

Proposal for Implementation

It is intended that the implementation of Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery be introduced to professionals within this setting. In-services focusing on how the resource guide will bridge the gap between current and future trends of OT’s in Level II nursery care will be necessary. The authors intend to meet with OT’s who indicated personal interest in the project to gain their assistance with implementation.

Conclusion

The scholarly project presents the case that OT’s possess the knowledge base and skills necessary to provide early intervention to infants born prematurely. The need for a resource guide was identified through an extensive literature review, which indicated that care received by infants born prematurely in rural areas is substandard to the care in urban/suburban areas. This is largely due to the limited exposure OT’s have to infants born prematurely in rural areas. Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery was developed based on the needs identified by the literature and hopes to increase the competency and comfort level of OT’s within this area of practice. It is intended that the resource guide be utilized within a Level II
nursery, and as the role of the OT evolves, the guide be expanded to ensure it is and up-to-date with current practice trends.

**Recommendations**

The intention of this resource guide is to provide a guideline for care for OT’s in a Level II nursery setting. OT within Level II nurseries is an emerging practice area and current trends are evolving, which creates a need for more in-depth research to be conducted, along with the development of further editions of the resource guide. Collaboration between all medical team members is critical for the well-being of the infant. In order for the other team members to gain an understanding of OT’s role within this setting, it is recommended that they have access to the resource guide. It is highly recommended that the resource guide be used in conjunction with additional competency techniques. It is recommended that the therapists utilizing this resource guide obtain observational hours with a NICU OT and additional continuing education courses.

*Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* is only one piece in the realm of preparing for competency while working in this practice area. The resource guide will assist the therapists in identifying where they need additional education. This, in turn, will increase the comfort and feelings of competency of the parents as well.
APPENDIX
Picture Release Forms
Unlimited Personal Release Agreement

Grant

For consideration which I acknowledge, I irrevocably grant LaVonne Fox, Lacy Gramstad and Lindsey Bartholome, authors of *Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery* for the right to the images of Kaitlyn Cook for the purposes of their scholarly project. The pictures are property of myself, Lacy Gramstad. I waive the right to inspect or approve versions of my image used for publication or the written copy that may used in connection with the images.

Release

I release Company and Company’s assigns, licensees and successors from any claims that may arise regarding the use of my image including any claims of defamation, invasion of privacy, or infringement of moral rights, rights of publicity or copyright. Company is permitted, although not obligated, to include my name as a credit in connection with the image.

Company is not obligated to utilize any of the rights granted in this Agreement.

I have read and understood this agreement and I am over the age of 18. This Agreement expresses the complete understanding of the parties.

Name: Lacy Gramstad Date: 4-4-08
Signature: ___________________________
Address: 411 Andrea Ln #5, Casper, WY 82609
Witness Signature: __________________

Parent/Guardian Consent [include if the person is under 18]

I am the parent or guardian of the minor named above. I have the legal right to consent to and do consent to the terms and conditions of this model release.

Parent/Guardian Name: Lacy Gramstad Date: 4-4-08
Parent/Guardian Signature: ___________________________
Parent/Guardian Address: 411 Andrea Ln #5, Casper, WY 82609
Witness Signature: __________________
Unlimited Personal Release Agreement

Grant

For consideration which I acknowledge, I irrevocably grant LaVonne Fox, Leecy Gramstad and Lindsey Bartholomew, authors of Bright Beginnings: Quick Tips for Occupational Therapists in the Level II Nursery the right to the images of Daniel Thomas

for the purposes of their scholarly project. The pictures are property of myself.

James Thomas

I waive the right to inspect or approve versions of my image used for publication or the written copy that may be used in connection with the images.

Release

I release Company and Company's assigns, licensees and successors from any claims that may arise regarding the use of my image including any claims of defamation, invasion of privacy, or infringement of moral rights, rights of publicity or copyright. Company is permitted, although not obligated, to include my name as a credit in connection with the image.

Company is not obligated to utilize any of the rights granted in this Agreement.

I have read and understood this agreement and I am over the age of 18. This Agreement expresses the complete understanding of the parties.

Name: James Thomas
Signature: [Signature]
Address: 9825 S. Silent Hills Dr. Lone Tree CO 80124
Witness Signature:

Parent/Guardian Consent [include if the person is under 18]

I am the parent or guardian of the minor named above. I have the legal right to consent to and do consent to the terms and conditions of this model release.

Parent/Guardian Name: James Thomas
Signature: [Signature]
Address: 9825 S. Silent Hills Dr. Lone Tree CO 80124
Witness Signature:
REFERENCES


www.aota.org/nonmembers/area13/, 2008

www.dictionary.com, 2007

www.marchofdimes.com, 2007