

**TENNESSEE PERINATAL CARE SYSTEM**  
**EDUCATIONAL OBJECTIVES FOR NURSES**  
**LEVELS I, II, III, IV**  
**AND**  
**NEONATAL TRANSPORT NURSES**

Sixth Edition



Effective July 1, 2017

**Tennessee Department of Health**  
**Family Health and Wellness**

**TENNESSEE PERINATAL CARE SYSTEM**

**EDUCATIONAL OBJECTIVES FOR NURSES  
LEVELS I, II, III, IV  
AND  
NEONATAL TRANSPORT NURSES  
(SIXTH EDITION)**

**Prepared by the  
Work Groups on Educational Objectives for Nurses Levels I, II, III, IV  
And  
Neonatal Transport Nurses**

**And Approved by the  
Perinatal Advisory Committee**

Web Address  
<http://health.state.tn.us/MCH>  
(Click on Perinatal Regionalization Program, scroll down to Publications)

## **WORK GROUP ON EDUCATIONAL OBJECTIVES FOR NURSES, 2016**

Kitty Cashion, RN-BC, MSN, Memphis  
Susan Drummond, RN, MSN, Nashville  
Sherri Hedberg, RN, BSN, IBCLC, Knoxville  
Patti Jacobs, RNC, BSN, Johnson City  
Traci Josephsen, RN, MSN, Chattanooga  
Mary Lee Lemley, RN, MSN, Nashville  
Patti Scott, DNP, APN, NNP-BC, C-NPT, Nashville  
Craig Towers, MD, Knoxville  
Nicole Z. Watson, RN, BSN, CLC, Knoxville  
Zachary Young-Lutz, RN, BSN, Knoxville

## **WORK GROUP ON NEONATAL TRANSPORT NURSES, 2016**

LuAnn Hall, MSN, CNS, Chattanooga  
Lauren Kinsall, RN, BSN, Nashville  
Mary Lee Lemley, RN, MSN, Nashville  
John T. Meadows, MD, Knoxville  
Jill Rimmer, RNC, Chattanooga  
Barbara G. Rowe, NNP-BC, Knoxville  
Patti Scott, DNP, APN, NNP-BC, NPT, Nashville  
Kelley Smith, RN, BSN, Memphis

## PERINATAL ADVISORY COMMITTEE

### **Committee Members**

Michael D. Warren, M.D., Chair  
David Adair, M.D., Chattanooga  
Alison Asaro, M.D., Nashville  
Frank H. Boehm, M.D., Nashville  
Kitty Cashion, R.N.-B.C., M.S.N., Memphis  
W. Michael DeVoe, M.D., Johnson City  
Ramasubbareddy Dhanireddy, M.D., Memphis  
Mark Gaylord, M.D., Knoxville  
Susan H. Guttentag, M.D., Nashville  
Muneeza Kahn, M.D., Memphis  
Mary Lee Lemley, R.N., M.S.N., Nashville  
Gwinnett Ladson, M.D., Nashville  
Lisa Lowery-Smith, M.D., Chattanooga  
Giancarlo Mari, M.D., Memphis  
Marta Papp, M.D., Nashville  
Marilyn Robinson, M.D., Memphis  
Karen E. Schetzina, M.D., Johnson City  
Lenita H. Thibault, M.D., Kingsport  
Craig Towers, M.D., Knoxville  
Selman Welt, M.D., Johnson City  
Jeff Whitehorn, Nashville

## TABLE OF CONTENTS

	Page
Introduction.....	5
Obstetric and Neonatal Objectives for Nurses in Birth Centers.....	6
Obstetric Objectives for Nurses in Level I Facilities.....	18
Neonatal Objectives for Nurses in Level I Facilities.....	25
Obstetric Objectives for Nurses in Level II Facilities.....	36
Neonatal Objectives for Nurses in Level II Facilities.....	41
Obstetric Objectives for Nurses in Level III Facilities.....	57
Neonatal Objectives for Nurses in Level III Facilities.....	63
Obstetric Objectives for Nurses in Level IV Facilities.....	80
Neonatal Objectives for Nurses in Level IV Facilities.....	86
Educational Objectives for Neonatal Transport Nurses.....	103

## INTRODUCTION

These *Educational Objectives for Nurses*, developed by a group of experienced obstetric and neonatal nurse educators, list the knowledge and skills necessary to provide quality nursing care to mothers and newborns. In this revised (6th) edition of the *Educational Objectives for Nurses*, the material has been separated by hospital levels of care and by specialty. Each section can stand alone. Like its predecessors, this manual has been written primarily for nurses practicing in a hospital setting. However, in this edition, a section has been added specifically to address the educational needs of nurses who practice in birth centers in Tennessee.

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings. Also, there are several nationally recognized programs available, including nursing education modules published by the March of Dimes; the AWHONN Perinatal Orientation Education Program (POEP), fetal monitoring program, and Neonatal Orientation Education Program (NOEP); the American Academy of Pediatrics (AAP) / American Heart Association (AHA) Neonatal Resuscitation Program; The S.T.A.B.L.E. Program and S.T.A.B.LE cardiac module; the Perinatal Continuing Education Program (PCEP); and the National Association of Neonatal Nurses (NANN) orientation program that can help to provide the knowledge and skills necessary to give quality care. Online education is also available through other sources (i.e., National Certification Corporation, Mead Johnson Nutritionals, and Abbott Laboratories). Nurse educators at each of the Regional Perinatal Centers are always available to consult in the development of educational programs or to actually provide such programs.

Educators will find that much has been left to their judgment. These objectives must be adapted to meet the needs of individuals in terms of sequence of presentation, time allotment to individual topics, and modalities of presentation. Simulation, especially when it is incorporated as a part of interprofessional team training, is increasingly being utilized for nursing education. Simulation allows participants to address several learning needs simultaneously, including cognitive, technical, and behavioral skills. Information contained in the most recent editions of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* and the *Guidelines for Transportation*, both published by the Tennessee Department of Health, Division of Family Health and Wellness, should be used to supplement this material.

In publishing this revised (6th) edition of the *Educational Objectives for Nurses*, it is hoped that they will be used to prepare nurses for providing the best possible family-centered, culturally sensitive care to low and high risk mothers and newborns.

**OBSTETRIC AND NEONATAL OBJECTIVES FOR  
NURSES IN BIRTH CENTERS**

## **OBSTETRIC AND NEONATAL OBJECTIVES FOR NURSES IN BIRTH CENTERS**

Birth Centers are licensed to provide peripartum care for uncomplicated pregnant women in vertex presentation at term, anticipating an uncomplicated singleton birth. These facilities must have the capability and equipment to provide low-risk maternal and newborn care and anticipate any potential emergency situation. CNMs, CMs, CPMs, licensed midwives, family physicians and OB-GYNs may be legally recognized to be a qualified professional attendant at a Birth Center. Registered nurses and licensed practical nurses may also provide care at the Birth Center for mothers and newborns.

These objectives primarily address the educational needs of registered nurses and licensed practical nurses who work in a Birth Center and may be met in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

The nurse caring for obstetric patients in a Birth Center should be able to:

### **PRECONCEPTION**

- I. Demonstrate an understanding of significant issues related to the preconception period.
  - A. Describe the anatomy and physiology of the non-pregnant reproductive system.
  - B. Describe the menstrual cycle.
  - C. Explain the process of conception, including fertilization and implantation.
  - D. Identify indications for preconception counseling.

### **PRENATAL**

- II. Demonstrate an understanding of significant issues related to the prenatal period.
  - A. Describe maternal physiologic changes of pregnancy by both organ system and trimester of pregnancy.
  - B. Identify alterations in values associated with pregnancy in commonly ordered laboratory tests.
  - C. Describe psychosocial adaptations made by the typical family to pregnancy.
  - D. Describe the stages of fetal growth and development.
  - E. Discuss the importance of good nutrition in pregnancy.
  - F. Explain the benefits of breastfeeding for mother and baby.
  - G. Explain the maternal and fetal effects of substance use/abuse during pregnancy.

- H. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history and physical assessment.
- I. Identify indications for and the significance of common maternal-fetal assessment techniques. Examples are:
  - 1. non-stress testing
  - 2. biophysical profile
- J. Demonstrate facility-based competency in interpretation and intervention regarding electronic fetal monitor tracings.
- K. Identify the essential components which should be included in prenatal and childbirth education.
- L. Explain the importance of screening for intimate partner violence in the pregnant woman.
- M. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.
- N. Identify indications and resources for prenatal referral.

### **INTRAPARTAL**

- III. Demonstrate an understanding of significant issues related to the intrapartal period.
  - A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.
  - B. Describe the stages and phases of labor.
  - C. Describe maternal physiologic and psychologic responses to labor.
  - D. Evaluate the fetal response to labor.
  - E. Evaluate and promote maternal and fetal well-being, using intermittent auscultation and uterine palpation, based on current recommendations by ACOG and AWHONN.
  - F. Outline appropriate emotional and physical support for the laboring woman and her support structure.
  - G. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia available at the facility.
  - H. Identify indications, procedures, and protocols for non-pharmaceutical methods of cervical ripening and/or labor induction/augmentation.

- I. Identify the patient with intrapartal complications and consult / refer according to facility guidelines. Examples of complications include:
  - 1. preterm labor
  - 2. premature rupture of membranes
  - 3. hypertensive disorders
  - 4. diabetes mellitus
  - 5. infectious diseases
  - 6. acute obstetric emergencies
  - 7. placental abnormalities (e.g., accreta, increta, percreta, and previa)
  - 8. trauma
  - 9. obesity (based on BMI)
- J. Explain the role of the provider and the nurse in assisting with the spontaneous vaginal delivery.
- M. Describe appropriate procedure for initial assessment and resuscitation of the newborn as specified by the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP, incorporating skin-to-skin as appropriate, based on maternal and neonatal condition.
- N. Identify the legal implications of perinatal nursing, including appropriate documentation.
- O. Identify indications and resources for intrapartal referral.

## **POSTPARTAL**

- IV. Demonstrate an understanding of significant issues related to the postpartal period.
  - A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, laboratory data, and a physical assessment.
  - B. Describe maternal physiologic and psychologic adaptation to the postpartal period.
  - C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.
  - D. Outline the emotional and physical support necessary for the postpartal woman and her significant others.
  - E. Describe measures to promote infant safety, including safe sleep, during and after the hospital stay.
  - F. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.
  - G. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.

- H. Describe the risks and benefits of various methods of contraception.
- I. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.
- J. Recognize the stages of grief and support the family during the process.
  - 1. Identify normal and pathologic responses to grief.
  - 2. Describe the techniques of intervention with families experiencing grief.
  - 3. Institute appropriate referrals as necessary.
- K. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.
- L. Assess, stabilize, and manage the newborn after delivery.

### **CONSULTATION/REFERRAL**

- V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.
  - A. Identify common indications for consultation regarding care and/or transport of the high risk mother or fetus utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - B. Describe the process of initiating consultation/referral with the Regional Perinatal Center or another hospital providing an appropriate level of care.
  - C. Outline stabilization measures commonly used either prior to or during transport.
  - D. Provide information to families concerning transport of babies to other facilities, if not provided by the transport team.

### **NEONATAL**

All nurses who care for neonatal patients should maintain current NRP and S.T.A.B.L.E. provider status.

The nurse caring for neonatal patients in a Birth Center should be able to:

- I. Identify those maternal risk factors in the preconceptional and intrapartal periods that place the fetus and/or neonate at risk.
- II. Describe the significance of normal and abnormal results for state-of-the-art preconceptional fetal assessment.
- III. Describe the significance of baseline fetal monitor information and variations in the fetal heart rate pattern.

- IV. Identify pharmacologic agents commonly used by the obstetric patient, assess their effects on the fetus and neonate, and plan care appropriately.
- V. Identify normal fetal circulation and describe the physiologic changes that occur at birth.
- VI. Manage the neonate's response to extrauterine life.
  - A. Describe the rationale for delaying cord clamping after birth, based on facility policy.
  - B. Assign the appropriate 1 and 5 minute Apgar scores. Continue to assign a score every 5 minutes for up to 20 minutes until the Apgar score is greater than 7.
  - C. Establish priorities for assessment based on maternal history, labor-delivery history, and neonatal status.
  - D. Provide routine assessment and resuscitation at delivery in accordance with the principles of the latest edition of the *Textbook of Neonatal Resuscitation* published by the American Heart Association and the American Academy of Pediatrics, incorporating skin-to-skin as appropriate, based on maternal and newborn condition.
  - E. State the rationale and procedure for administering prophylactic eye medication to the neonate and the institutional protocol for parental refusal.
  - F. State the rationale and procedure for administering Vitamin K to the neonate and the institutional protocol for parental refusal.
- VII. Identify the physiologic changes that occur during the transitional period.
- VIII. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.
  - A. State the homeostatic range for the following during neonatal life:
    - 1. temperature
    - 2. heart rate
    - 3. oxygen saturation
    - 4. respiratory rate
    - 5. blood pressure
    - 6. hematocrit/hemoglobin
    - 7. blood glucose
  - B. When given a neonate to assess, identify normal physical characteristics and common variations related to:
    - 1. body contour, proportions, and posture
    - 2. head (including occipital frontal circumference, names of fontanelles and sutures)
    - 3. face (including mouth and nose)

4. eyes
5. ears (hearing screening)
6. skin
7. chest
8. abdomen
9. genitalia and rectum
10. extremities
11. vertebral column
12. reflexes
13. pain

C. When given a neonate to assess:

1. identify, describe and locate point of maximal impulse of the heart
2. count and record apical heart rate
3. identify obvious heart murmurs
4. auscultate the lungs to identify normal and abnormal breath sounds
5. describe skin texture, color, and perfusion
6. identify flaring of the nostrils, retractions, grunting, and inspiratory stridor, and relate the significance of these findings to problems experienced by the neonate
7. identify the placement and strength of brachial and femoral pulses
8. describe abdominal girth and shape, bowel sounds, stooling pattern, and voiding pattern
9. describe level of consciousness, activity, and comfort / pain
10. measure and record vital signs
11. measure and record blood glucose
12. describe signs and symptoms of trauma, congenital anomaly, and infection
13. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings

IX. Accurately determine the gestational age of a neonate by using a standardized scoring system.

A. Define the following terms:

1. early term, full term, and late term neonate
2. preterm neonate
3. late preterm neonate
4. post-term neonate
5. small for gestational age (symmetric and asymmetric)
6. intrauterine growth restriction (IUGR) (symmetric and asymmetric)
7. large for gestational age
8. appropriate for gestational age

B. Determine the gestational age of a neonate.

C. Determine a neonate's growth classification by plotting the birthweight, head circumference, and length on the growth chart.

- D. When given a simulated or actual patient situation, state the significance of abnormal intrauterine growth.
- X. Describe and provide developmentally appropriate care.
- XI. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.
  - A. Define neutral thermal balance.
  - B. List four physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.
  - C. List four modes of heat transfer in the neonate, give an example of how each occurs, and identify interventions to decrease heat transfer by each of the four modes.
  - E. Describe the physiologic process by which the neonate attempts to maintain body temperature.
  - F. List major physiologic problems which may result from cold stress.
  - G. List major physiologic problems associated with hyperthermia of the neonate.
  - H. Identify optimal skin, axillary and core temperatures for both premature and term neonates.
  - I. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.
  - J. Compare and contrast methods of providing external heat for the neonate if available at the facility and identify advantages and disadvantages of the following:
    - 1. skin-to-skin care
    - 2. warm, draft free room
    - 3. incubator
    - 4. radiant warmer
    - 5. servo-control
    - 6. manual control (use only to preheat the bed)
    - 7. heat packs and mattresses
    - 8. polyethylene plastic bags or wraps
  - K. Describe safe methods of increasing and decreasing a neonate's temperature.
  - L. Provide a thermal environment for the neonate which minimizes metabolic activity.
  - M. Describe an education plan that includes appropriate temperature assessment and management by the parents.

- N. Plan nursing care to maintain an optimal temperature.
  - O. Utilize all thermoregulation equipment safely.
- XII. Assess the neonate's fluid and nutritional needs based upon gestational age, growth and weight.
- A. Recognize fluid, nutritional, and caloric needs of the term neonate based upon weight and postnatal age.
  - B. Describe gestational age, growth, muscle activity, level of consciousness, and cardiorespiratory patterns associated with nipple feeding success.
  - C. Initiate feedings promptly, based on unit policy.
  - D. Encourage, promote and support early breast feeding or collection of breast milk for infants who are transferred to another hospital.
  - E. Teach and assess basic breastfeeding techniques, including latch, milk transfer, hand expression, and safe milk storage.
  - F. Describe techniques for encouraging optimal feeding and nutrition of the well term and late preterm neonate. Utilize the services of a lactation consultant as appropriate.
  - G. Describe methods of assessing for adequate hydration in the hospital and the home.
  - H. Identify measures which minimize fluid loss in the healthy, growing infant and the neonate being prepared for transport.
- XIII. Identify respiratory and / or cardiovascular problems and initiate emergency and supportive care until transport of the neonate can be accomplished.
- A. List the physiologic changes which must occur at birth in order for the lungs to function and provide oxygenation.
  - B. When given a neonate to assess, differentiate between a normal and abnormal respiratory assessment.
  - C. Identify, record, and report the following:
    1. shift of point of maximal impulse to right or left
    2. obvious murmurs
    3. abnormal heart rate (include both tachycardia and bradycardia)
    4. abnormal rhythm/arrhythmia
    5. blood pressure in all four extremities
    6. strength of pulses in all four extremities
    7. pulse pressure
    8. pre- and post-ductal oxygen saturation

- D. Describe indications for oxygen therapy, methods for delivering oxygen to the neonate, and appropriate use of pulse oximeters.
  - E. Briefly describe signs of pneumothorax and immediate stabilization of this complication.
  - F. Briefly describe the pathogenesis and management of pulmonary and non-pulmonary respiratory distress.
  - G. Administer appropriate care and medications needed to stabilize the neonate with a suspected or confirmed ductal (ductus arteriosus) dependent cardiac defect/condition.
- XIV. Evaluate the neonate for inappropriate glucose metabolism and take appropriate action based upon findings.
- A. Identify neonates at risk for hypoglycemia based on maternal history, birthweight, gestational age, neonatal pathology, and signs of hypoglycemia.
  - B. Utilize history and physical assessment to plan glucose screening.
  - C. Utilize nursing measures to correct and maintain blood glucose levels within the normal range by:
    - 1. initiating feedings promptly, per facility policy
    - 2. administering colostrum or formula feedings and / or oral glucose based on the neonate's blood glucose level, clinical stability, and health care provider's order.
- XV. Plan, provide and evaluate the nursing care of neonates with hyperbilirubinemia.
- A. Define direct bilirubin, indirect bilirubin, and total bilirubin.
  - B. Describe the metabolism of bilirubin.
  - C. Describe the mechanism responsible for physiologic jaundice.
  - D. List the criteria for differentiating physiologic and pathologic jaundice in the neonate.
  - E. Describe the pathophysiologic changes that may be responsible for intravascular hemolysis, extravascular hemolysis, and impaired hepatic function as related to hyperbilirubinemia.
  - F. Describe those factors that increase the risk of neurotoxicity due to hyperbilirubinemia.
  - G. Define and explain the difference between breast feeding and human milk jaundice.
  - H. Describe briefly the mechanism by which different types of phototherapy decrease bilirubin levels.

- I. Correctly administer and evaluate the method(s) of phototherapy used at your hospital to provide maximum effect and to decrease and/or lessen the side effects of therapy.
  - J. Identify indications and rationale for exchange transfusions.
  - K. Describe the rationale for bilirubin screening.
- XVI. Plan, provide and evaluate nursing care for neonates with selected hematological disorders.
- A. State the normal circulating blood volume in the neonate.
  - B. Identify the normal laboratory values of the following tests:
    - 1. hematocrit/hemoglobin
    - 2. reticulocyte count
    - 3. platelet count
    - 4. Coombs test
  - C. List common causes of hemolytic and hemorrhagic anemia in the newborn during the first day of life.
  - D. List the signs and laboratory data characteristics of acute and chronic anemia.
  - E. Identify the factors which indicate the need for a Coombs test, type, Rh, and reticulocyte count.
  - F. Discuss the pathogenesis of Rh and ABO incompatibility.
- XVII. Identify common sources for perinatal infections, signs of infections, and methods to prevent health care associated infections.
- A. Identify sources of congenital and health care associated infections.
  - B. Utilize maternal history, birth history, clinical presentation, and serial laboratory results as a basis for planning neonatal infectious disease screening and management.
  - C. Explain the importance of conscientious handwashing / hand sanitizing and use of universal precautions by staff, parents, and visitors to prevent health care associated infections.
  - D. Describe the pathogenesis of common perinatal infections.
  - E. Discuss and provide care required for the infant based on maternal infection-related history (hepatitis B status, HIV, sexually transmitted infections, other), including appropriateness of breastfeeding.
  - F. Identify and report signs of sepsis in the neonate.

- G. List the normal white blood count, differential, and platelet count in the neonate.
  - H. Describe initial management of the septic neonate awaiting transport.
- XVIII. Evaluate the neonate for gastrointestinal problems, record findings, and initiate action based upon findings.
- A. List clinical signs of gastrointestinal dysfunction.
  - B. Identify pathogenesis, presentation, and early management of esophageal and gastrointestinal fistulas, obstructions, and abdominal wall defects.
- XIX. Assess and manage the infant with suspected neonatal abstinence syndrome (NAS).
- A. Identify the infant at risk for NAS and describe the nurse's role in the screening tests per facility policy.
  - B. Describe signs of NAS.
  - C. Describe facility policy regarding the mandatory reporting of NAS cases to the Tennessee Department of Health.
- XX. Discuss the concept of culturally-sensitive, family-centered care, utilizing current concepts in parent-infant attachment.
- XXI. Recognize the stages of emotional stress and grief and appropriately support the family during this process. This includes both families dealing with an infant loss and those dealing with an infant requiring palliative care.
- A. Identify both normal and pathologic responses to crisis and grief.
  - B. Describe techniques of intervention with families experiencing crisis and grief.
  - C. Intervene therapeutically and institute appropriate referrals.
- XXII. Describe a management and education plan that promotes infant safety in the hospital and the community. One place where information can be located is the AAP "parenting corner" section on their Healthy Children website. The website can be accessed at [www.HealthyChildren.org](http://www.HealthyChildren.org). Topics addressed in the "parenting corner" include, among others, the following:
- A. Bathing and skin care
  - B. Cord care
  - C. Conscientious hand washing / hand sanitizing and appropriate hygiene
  - D. Immunizations per current recommendations from the American Academy of Pediatrics

- E. Falls
  - F. Burns (including sunburn)
  - G. Safe sleep
  - H. Emergency preparedness / disaster planning (examples are infant security, Code Pink, evacuation, etc.)
  - I. Infant restraint device / institutional policy regarding car seat tolerance testing
  - J. According to state statute (TCA), at least one infant parent or caregiver must receive information regarding infant CPR before discharge from the hospital. Tennessee Hospital Association member hospitals have been granted permission to refer caregivers to the website [www.learncpr.org](http://www.learncpr.org).
  - K. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect
  - L. Reasons for avoiding second hand smoke around infants and children
  - M. Reasons to contact the baby's primary care provider (no stool in 24 hours, decreased urine output, refusal to feed, change in activity, abnormal temperature, etc.)
- XXIII. Discuss current state laws related to hospital care of the neonate.
- A. Explain the rationale for newborn metabolic, hearing, and critical congenital heart disease screening. Discuss situations where metabolic screening before 24 hours of age is required (such as babies requiring transfer to a higher level of care or a blood transfusion).
  - B. Explain the rationale for child safety regulations and the role of the nurse in implementing them.
  - C. Perform car seat safety check prior to hospital discharge when indicated. Describe the role of the nurse in car seat tolerance testing for selected infants.
- XXIV. Discuss the history, principles, and purpose of perinatal health care regionalization.
- XXV. Identify responsibilities of the birth center and the individual nurse in the regionalization process.
- XXVI. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.
- A. Identify common indications for consultation regarding care and/or transport of the high- risk neonate utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.

- B. Describe the process for initiating consultation/referral with the appropriate referral center.
- C. Outline stabilization measures commonly used either prior to or during transport using the S.T.A.B.L.E. mnemonic.
- D. Utilize the most recent edition of the Tennessee Perinatal Care System Guidelines for Transportation as the basis for planning and managing transfer.
- E. Provide information to families concerning transport of babies to other facilities, if not provided by the transport team.

**OBSTETRIC OBJECTIVES FOR  
NURSES IN LEVEL I FACILITIES**

## OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL I FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

The nurse caring for obstetric patients in a Level I facility should be able to:

### PRECONCEPTION

- I. Demonstrate an understanding of significant issues related to the preconception period.
  - A. Describe the anatomy and physiology of the non-pregnant reproductive system.
  - B. Describe the menstrual cycle.
  - C. Explain the process of conception, including fertilization and implantation.
  - D. Identify indications for preconception counseling.

### PRENATAL

- II. Demonstrate an understanding of significant issues related to the prenatal period.
  - A. Describe maternal physiologic changes of pregnancy by both organ system and trimester of pregnancy.
  - B. Identify alterations in values associated with pregnancy in commonly ordered laboratory tests.
  - C. Describe psychosocial adaptations made by the typical family to pregnancy.
  - D. Describe the stages of fetal growth and development.
  - E. Discuss the importance of good nutrition in pregnancy.
  - F. Explain the benefits of breastfeeding for mother and baby.
  - G. Explain the maternal and fetal effects of substance use/abuse during pregnancy.
  - H. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history and physical assessment.
  - I. Identify indications for and the significance of common maternal-fetal assessment techniques. Examples are:
    1. non-stress testing
    2. biophysical profile

- J. Identify the essential components which should be included in prenatal and childbirth education.
- K. Explain the importance of screening for intimate partner violence in the pregnant woman.
- L. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.
- M. Identify indications and resources for prenatal referral.

## **INTRAPARTAL**

- III. Demonstrate an understanding of significant issues related to the intrapartal period.
  - A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.
  - B. Describe the stages and phases of labor.
  - C. Describe maternal physiologic and psychologic responses to labor.
  - D. Evaluate the fetal response to labor.
  - E. Evaluate and promote maternal and fetal well-being, based on assessment of fetal monitor tracings, utilizing the NICHD terminology currently recommended by ACOG and AWHONN.
  - F. Demonstrate unit-based competency in interpretation and intervention regarding electronic fetal monitor tracings.
  - G. Outline appropriate emotional and physical support for the laboring woman and her support structure.
  - H. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia.
  - I. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.
  - J. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.
  - K. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:
    - 1. preterm labor
    - 2. premature rupture of membranes
    - 3. hypertensive disorders
    - 4. diabetes mellitus

5. infectious diseases
  6. acute obstetric emergencies
  7. placental abnormalities (e.g., accreta, increta, percreta, and previa)
  8. trauma
  9. obesity (based on BMI)
- L. Explain the role of the nurse in assisting with the spontaneous and operative vaginal delivery.
  - M. Describe appropriate procedure for initial assessment and resuscitation of the newborn as specified by the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP, incorporating skin-to-skin contact as appropriate based on maternal and newborn condition.
  - N. Identify the legal implications of perinatal nursing, including appropriate documentation.
  - O. Identify indications and resources for intrapartal referral.

## **POSTPARTAL**

- IV. Demonstrate an understanding of significant issues related to the postpartal period.
  - A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, laboratory data, and a physical assessment.
  - B. Describe maternal physiologic and psychologic adaptation to the postpartal period.
  - C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.
  - D. Outline the emotional and physical support necessary for the postpartal woman and her significant others.
  - E. Describe measures to promote infant safety, including safe sleep, during and after the hospital stay.
  - F. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.
  - G. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success in both the hospital and the community.
  - H. Describe the risks and benefits of various methods of contraception.
  - I. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.
  - J. Recognize the stages of grief and support the family during the process.

1. Identify normal and pathologic responses to grief.
  2. Describe the techniques of intervention with families experiencing grief.
  3. Institute appropriate referrals as necessary.
- K. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.
- L. Assess, stabilize, and manage the newborn after delivery.

### **CONSULTATION/REFERRAL**

- V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.
- A. Identify common indications for consultation regarding care and/or transport of the high risk mother or fetus utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - B. Describe the process of initiating consultation/referral with the Regional Perinatal Center or another hospital providing an appropriate level of care.
  - C. Outline stabilization measures commonly used either prior to or during transport.

## **NEONATAL OBJECTIVES FOR NURSES IN LEVEL I FACILITIES**

## NEONATAL OBJECTIVES FOR NURSES IN LEVEL I FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

All neonatal nurses should maintain current NRP and S.T.A.B.L.E. provider status.

The nurse caring for neonatal patients in a Level I facility should be able to:

- I. Identify those maternal risk factors in the preconceptional and intrapartal periods that place the fetus and/or neonate at risk.
- II. Describe the significance of normal and abnormal results for state-of-the-art preconceptional fetal assessment.
- III. Describe the significance of baseline fetal monitor information and variations in the fetal heart rate pattern.
- IV. Identify pharmacologic agents commonly used by the obstetric patient, assess their effects on the fetus and neonate, and plan care in the well-baby nursery.
- V. Identify normal fetal circulation and describe the physiologic changes that occur at birth.
- VI. Manage the neonate's response to extrauterine life.
  - A. Describe the rationale for delaying cord clamping after birth, based on unit policy.
  - B. Assign the appropriate 1 and 5 minute Apgar scores. Continue to assign a score every 5 minutes for up to 20 minutes until the Apgar score is greater than 7.
  - C. Establish priorities for assessment based on maternal history, labor-delivery history, and neonatal status.
  - D. Provide routine assessment and resuscitation at delivery in accordance with the principles of the latest edition of the *Textbook of Neonatal Resuscitation* published by the American Heart Association and the American Academy of Pediatrics, incorporating skin-to-skin as appropriate, based on maternal and newborn condition.
  - E. State the rationale and procedure for administering prophylactic eye medication to the neonate and the institutional protocol for parental refusal.
  - F. State the rationale and procedure for administering Vitamin K to the neonate and the institutional protocol for parental refusal.
  - G. Identify babies who may be candidates for neuroprotective hypothermia. Discuss with the receiving facility the possible need and methods for passive cooling in a baby who is being transferred for neuroprotective hypothermia.
- VII. Identify the physiologic changes that occur during the transitional period.

- VIII. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.
- A. State the homeostatic range for the following during neonatal life:
1. temperature
  2. heart rate
  3. oxygen saturation
  4. respiratory rate
  5. blood pressure
  6. hematocrit/hemoglobin
  7. blood glucose
- B. When given a neonate to assess, identify normal physical characteristics and common variations related to:
1. body contour, proportions, and posture
  2. head (including occipital frontal circumference, names of fontanelles and sutures)
  3. face (including mouth and nose)
  4. eyes
  5. ears (hearing screening)
  6. skin
  7. chest
  8. abdomen
  9. genitalia and rectum
  10. extremities
  11. vertebral column
  12. reflexes
  13. pain
    - a. Discuss the appropriate use of oral sucrose solutions
- C. When given a neonate to assess:
1. identify, describe and locate point of maximal impulse of the heart
  2. count and record apical heart rate
  3. identify obvious heart murmurs
  4. auscultate the lungs to identify normal and abnormal breath sounds
  5. describe skin texture, color, and perfusion
  6. identify flaring of the nostrils, retractions, grunting, and inspiratory stridor, and relate the significance of these findings to problems experienced by the neonate
  7. identify the placement and strength of brachial and femoral pulses
  8. describe abdominal girth and shape, bowel sounds, stooling pattern, and voiding pattern
  9. describe level of consciousness, activity, and comfort / pain
  10. measure and record vital signs
  11. measure and record blood glucose
  12. describe signs and symptoms of trauma, congenital anomaly, and infection

13. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings
  - D. Describe appropriate ways of obtaining blood samples from a variety of sites which optimize accurate lab results and minimize complications for the newborn.
- IX. Accurately determine the gestational age of a neonate by using a standardized scoring system.
- A. Define the following terms:
    1. early term, full term, and late term neonate
    2. preterm neonate
    3. late preterm neonate
    4. post-term neonate
    5. small for gestational age (symmetric and asymmetric)
    6. intrauterine growth restriction (IUGR) (symmetric and asymmetric)
    7. large for gestational age
    8. appropriate for gestational age
  - B. Determine the gestational age of a neonate.
  - C. Describe problems associated with preterm, late preterm and post-term birth.
  - D. Describe early stabilization, assessment, and transfer plans for gestational age  $\leq 35$  weeks.
  - E. Determine a neonate's growth classification by plotting the birthweight, head circumference, and length on the growth chart.
  - F. When given a simulated or actual patient situation, state the significance of abnormal intrauterine growth.
- X. Describe and provide developmentally appropriate care.
- XI. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.
- A. Define neutral thermal balance.
  - B. List four physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.
  - C. List four modes of heat transfer in the neonate, give an example of how each occurs, and identify interventions to decrease heat transfer by each of the four modes.
  - D. Describe the physiologic process by which the neonate attempts to maintain body temperature.
  - E. List major physiologic problems which may result from cold stress.

- F. List major physiologic problems associated with hyperthermia of the neonate.
  - G. Identify optimal skin, axillary and core temperatures for both premature and term neonates.
  - H. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.
  - I. Compare and contrast methods of providing external heat for the neonate and identify advantages and disadvantages of the following:
    - 1. skin-to-skin care
    - 2. warm, draft free room (operating, delivery, nursery, NICU)
    - 3. incubator
    - 4. radiant warmer
    - 5. servo-control
    - 6. manual control (use only to preheat the bed)
    - 7. heat packs and mattresses
    - 8. polyethylene plastic bags or wraps
  - J. Describe safe methods of increasing and decreasing a neonate's temperature.
  - K. Provide a thermal environment for the neonate which minimizes metabolic activity.
  - L. Describe an education plan that includes appropriate temperature assessment and management by the parents.
  - M. Plan nursing care to maintain an optimal temperature.
  - N. Utilize all thermoregulation equipment safely.
- XII. Assess the neonate's fluid and nutritional needs based upon gestational age, growth and weight.
- A. Recognize fluid, nutritional, and caloric needs of the term neonate based upon weight and postnatal age.
  - B. Describe gestational age, growth, muscle activity, level of consciousness, and cardiorespiratory patterns associated with nipple feeding success.
  - C. Initiate feedings promptly, based on unit policy.
  - D. Encourage, promote and support early breast feeding or collection of breast milk for infants who are transferred to another hospital.
  - E. Teach and assess basic breastfeeding techniques, including latch, milk transfer, hand expression, and safe milk storage.

- F. Describe techniques for encouraging optimal feeding and nutrition of the well term and late preterm neonate. Utilize the services of a lactation consultant as appropriate.
  - G. Describe methods of assessing for adequate hydration in the hospital and the home.
  - H. Identify measures which minimize fluid loss in the healthy, growing infant and the neonate being prepared for transport.
- XIII. Identify respiratory and / or cardiovascular problems and initiate emergency and supportive care until transport of the neonate can be accomplished.
- A. List the physiologic changes which must occur at birth in order for the lungs to function and provide oxygenation.
  - B. When given a neonate to assess, differentiate between a normal and abnormal respiratory assessment.
  - C. Identify, record, and report the following:
    1. shift of point of maximal impulse to right or left
    2. obvious murmurs
    3. abnormal heart rate (include both tachycardia and bradycardia)
    4. abnormal rhythm/arrhythmia
    5. blood pressure in all four extremities
    6. strength of pulses in all four extremities
    7. pulse pressure
    8. pre- and post-ductal oxygen saturation
  - D. Describe indications for oxygen therapy, methods for delivering oxygen to the neonate, and appropriate use of oxygen analyzers, saturation monitors, and capillary / arterial blood gases.
  - E. Briefly describe signs of pneumothorax and immediate stabilization of this complication.
  - F. Briefly describe the pathogenesis and management of pulmonary and non-pulmonary respiratory distress.
  - G. Identify babies who may be candidates for neuroprotective hypothermia.
  - H. Administer appropriate care and medications needed to stabilize the neonate with a suspected or confirmed ductal (ductus arteriosus) dependent cardiac defect/condition.
- XIV. Evaluate the neonate for inappropriate glucose metabolism and take appropriate action based upon findings.
- A. Identify neonates at risk for hypoglycemia based on maternal history, birthweight, gestational age, neonatal pathology, and signs of hypoglycemia.

- B. Utilize history and physical assessment to plan glucose screening.
  - C. Utilize nursing measures to correct and maintain blood glucose levels within the normal range by:
    - 3. initiating feedings promptly, per unit policy
    - 4. administering feedings and / or intravenous glucose based on the neonate's blood glucose level, clinical stability, and health care provider's order.
- XV. Plan, provide and evaluate the nursing care of neonates with hyperbilirubinemia.
- A. Define direct reacting bilirubin (conjugated bilirubin, bilirubin glucuronide), indirect reacting bilirubin (unconjugated bilirubin), and total bilirubin.
  - B. Describe the metabolism of bilirubin.
  - C. Describe the mechanism responsible for physiologic jaundice.
  - D. List the criteria for differentiating physiologic and pathologic jaundice in the neonate.
  - E. Describe the pathophysiologic changes that may be responsible for intravascular hemolysis, extravascular hemolysis, and impaired hepatic function as related to hyperbilirubinemia.
  - F. Describe those factors that increase the risk of neurotoxicity due to hyperbilirubinemia.
  - G. Define and explain the difference between breast feeding and human milk jaundice.
  - H. Describe briefly the mechanism by which different types of phototherapy decrease bilirubin levels.
  - I. Correctly administer and evaluate the method(s) of phototherapy used at your hospital to provide maximum effect and to decrease and/or lessen the side effects of therapy.
  - J. Identify indications and rationale for exchange transfusions.
  - K. Describe the rationale for routine bilirubin screening prior to discharge.
  - L. XVI. Plan, provide and evaluate nursing care for neonates with selected hematological disorders.
  - M. State the normal circulating blood volume in the neonate.
  - N. Identify the normal laboratory values of the following tests:

1. hematocrit/hemoglobin
  2. reticulocyte count
  3. platelet count
  4. Coombs test
  5. G6PD
- O. List common causes of hemolytic and hemorrhagic anemia in the newborn during the first day of life.
- P. List the signs and laboratory data characteristics of acute and chronic anemia.
- Q. Identify the factors which indicate the need for a Coombs test, type, Rh, and reticulocyte count.
- R. Discuss the pathogenesis of Rh and ABO incompatibility.
- XVII. Identify common sources for perinatal infections, signs of infections, and methods to prevent health care associated infections.
- A. Identify sources of congenital and health care associated infections.
  - B. Utilize maternal history, birth history, clinical presentation, and serial laboratory results as a basis for planning neonatal infectious disease screening and management.
  - C. Explain the importance of conscientious handwashing / hand sanitizing and use of universal precautions by staff, parents, and visitors to prevent health care associated infections.
  - D. Describe the pathogenesis of common perinatal infections.
  - E. Discuss and provide care required for the infant based on maternal infection-related history (hepatitis B status, HIV, sexually transmitted infections, other), including appropriateness of breastfeeding.
  - F. Identify and report signs of sepsis in the neonate.
  - G. List the normal white blood count, differential, and platelet count in the neonate.
  - H. Identify antimicrobial agents appropriate for community-acquired neonatal colonization.
  - I. Calculate the correct dosage of antibiotics used to treat infection based upon an approved dose.
  - J. Describe initial management of the septic neonate awaiting transport.
- XVIII. Evaluate the neonate for gastrointestinal problems, record findings, and initiate action based upon findings.
- A. List clinical signs of gastrointestinal dysfunction.

- B. Describe signs of pathology which would indicate the need for:
    - 1. no feedings (NPO)
    - 2. holding feedings
    - 3. intermittent GI suction
    - 4. changing of infant's position
    - 5. sterile protective covering of exposed organs
    - 6. consultation / possible transfer to a higher level of care
  - C. Identify pathogenesis, presentation, and early management of esophageal and gastrointestinal fistulas, obstructions, and abdominal wall defects.
- XIX. Describe a management plan that limits the spread of infection as described in unit policy.
- XX. Assess and manage the infant with suspected neonatal abstinence syndrome (NAS).
- A. Identify the infant at risk for NAS and describe the nurse's role in the screening tests per unit policy.
  - B. Describe signs of NAS.
  - C. Demonstrate use of appropriate NAS scoring system.
  - D. Describe non-pharmacologic and pharmacologic management of NAS.
  - E. Describe hospital policy regarding the mandatory reporting of NAS cases to the Tennessee Department of Health.
- XXI. Discuss the concept of culturally-sensitive, family-centered care, utilizing current concepts in parent-infant attachment.
- XXII. Describe policies related to discharge of newborns to someone other than the birth parent.
- XXIII. Recognize the stages of emotional stress and grief and appropriately support the family during this process. This includes both families dealing with an infant loss and those dealing with an infant requiring palliative care.
- A. Identify both normal and pathologic responses to crisis and grief.
  - B. Describe techniques of intervention with families experiencing crisis and grief.
  - C. Intervene therapeutically and institute appropriate referrals.
- XXIV.. Describe a management and education plan that promotes infant safety in the hospital and the community. One place where information can be located is the AAP "parenting corner" section on their Healthy Children website. The website can be accessed at [www.HealthyChildren.org](http://www.HealthyChildren.org). Topics addressed in the "parenting corner" include, among others, the following:

- A. Bathing and skin care
  - B. Cord care
  - C. Care for circumcised and uncircumcised infants
  - D. Conscientious hand washing / hand sanitizing and appropriate hygiene
  - E. Immunizations per current recommendations from the American Academy of Pediatrics
  - F. RSV prevention, excluding Palivizumab
  - G. Falls
  - H. Burns (including sunburn)
  - I. Safe sleep
  - J. Emergency preparedness / disaster planning (examples are infant security, Code Pink, evacuation, etc.)
  - K. Infant restraint device / institutional policy regarding car seat tolerance testing.
  - L. According to state statute (TCA), at least one infant parent or caregiver must receive information regarding infant CPR before discharge from the hospital. Tennessee Hospital Association member hospitals have been granted permission to refer caregivers to the website [www.learncpr.org](http://www.learncpr.org).
  - M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect
  - N. Reasons for avoiding second hand smoke around infants and children
  - O. Reasons to contact the baby's primary care provider (no stool in 24 hours, decreased urine output, refusal to feed, change in activity, abnormal temperature, etc.)
- XXV. Discuss current state laws related to hospital care of the neonate.
- A. Explain the rationale for newborn metabolic, hearing, and critical congenital heart disease screening. Discuss situations where metabolic screening before 24 hours of age is required (such as babies requiring transfer to a higher level of care or a blood transfusion).
  - B. Explain the rationale for child safety regulations and the role of the nurse in implementing them.
  - C. Perform car seat safety check prior to hospital discharge when indicated. Describe the role of the nurse in car seat tolerance testing for selected infants.

- XXVI. Discuss the history, principles, and purpose of perinatal health care regionalization.
- XXVII. Identify responsibilities of the community hospital and the individual nurse in the regionalization process.
- XXVIII. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.
- A. Identify common indications for consultation regarding care and/or transport of the high- risk neonate utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - B. Describe the process for initiating consultation/referral with the appropriate referral center.
  - C. Outline stabilization measures commonly used either prior to or during transport using the S.T.A.B.L.E. mnemonic.
  - D. Utilize the most recent edition of the Tennessee Perinatal Care System *Guidelines for Transportation* as the basis for planning and managing transfer.

**OBSTETRIC OBJECTIVES FOR  
NURSES IN LEVEL II FACILITIES**

## OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL II FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

The nurse caring for obstetric patients in a Level II facility should be able to:

### PRECONCEPTION

- I. Demonstrate an understanding of significant issues related to the preconception period.
  - A. Describe the anatomy and physiology of the non-pregnant reproductive system.
  - B. Describe the menstrual cycle.
  - C. Explain the process of conception, including fertilization and implantation.
  - D. Identify indications for preconception counseling.

### PRENATAL

- II. Demonstrate an understanding of significant issues related to the prenatal period.
  - A. Describe maternal physiologic changes of pregnancy by both body system and trimester of pregnancy.
  - B. Identify alterations in laboratory values associated with pregnancy.
  - C. Describe psychosocial adaptations made by the family to both low and high-risk pregnancy.
  - D. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.
  - E. Describe the importance of good nutrition in pregnancy.
  - F. Explain the benefits of breastfeeding for mother and baby.
  - G. Explain the maternal and fetal effects of substance use/abuse during pregnancy.
  - H. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history and physical assessment.
  - I. Identify indications for and the significance and interpretation of currently used and newly developing maternal-fetal assessment techniques. Examples are:
    1. maternal assays using multiple marker screens
    2. high resolution ultrasonography
    3. fetal lung maturity studies

4. chromosomal evaluation
  5. non-stress test
  6. biophysical profile
- J. Identify components which should be included in comprehensive prenatal and childbirth education.
  - K. Explain the importance and process of screening for intimate partner violence in the pregnant woman.
  - L. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.
  - M. Identify indications and resources for prenatal referral.

### **INTRAPARTAL**

- III. Demonstrate an understanding of significant issues related to the intrapartal period.
  - A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.
  - B. Describe the stages and phases of labor.
  - C. Describe maternal physiologic and psychologic responses to labor.
  - D. Evaluate the fetal response to labor.
  - E. Explain and promote maternal and fetal well-being, based on assessment of fetal monitor tracings, utilizing the NICHD terminology currently recommended by ACOG and AWHONN.
  - F. Demonstrate unit-based competency in interpretation and intervention regarding electronic fetal monitor tracings.
  - G. Outline appropriate emotional and physical support for the laboring woman and significant others.
  - H. Describe the responses of the mother and fetus to commonly used analgesics and types of anesthesia.
  - I. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.
  - J. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.
  - K. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:

1. preterm labor
  2. premature rupture of membranes
  3. hypertensive disorders
  4. diabetes mellitus
  5. infectious diseases
  6. acute obstetric emergencies
  7. placental abnormalities (e.g., accreta, increta, percreta, and previa)
  8. trauma
  9. obesity (based on BMI)
- L. Explain the role of the nurse in assisting with the spontaneous and operative vaginal delivery.
- M. Demonstrate the appropriate procedure for initial assessment and resuscitation of the newborn as specified by the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP, incorporating skin-to-skin as appropriate, based on maternal and newborn condition.
- N. Identify the legal implications of perinatal nursing, including appropriate documentation.
- O. Identify indications and resources for intrapartal referral.

## **POSTPARTAL**

- IV. Demonstrate an understanding of significant issues related to the postpartal period.
- A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, labor data, and a physical assessment.
  - B. Describe maternal physiologic and psychologic adaptation to the postpartal period.
  - C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.
  - D. Outline emotional and physical support necessary for the postpartal woman and her significant others.
  - E. Identify measures to promote infant safety, including safe sleep, during and after the hospital stay.
  - F. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.
  - G. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.
  - H. Describe the risks and benefits of various methods of contraception.

- I. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.
- J. Recognize the stages of grief and support the family during the process.
  - 1. Identify normal and pathologic responses to grief.
  - 2. Describe techniques of intervention with families experiencing grief.
  - 3. Institute appropriate referrals as necessary.
- K. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.
- L. Assess, stabilize, and manage the newborn after delivery.

### **CONSULTATION/REFERRAL**

- V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.
  - A. Identify common indications for consultation regarding care and/or transport of high-risk mother or fetus utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - B. Describe the process of initiating consultation/referral with the Regional Perinatal Center or another hospital providing an appropriate level of care.
  - C. Outline stabilization measures commonly used either prior to or during transport.

**NEONATAL OBJECTIVES FOR  
NURSES IN LEVEL II FACILITIES**

## NEONATAL OBJECTIVES FOR NURSES IN LEVEL II FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

All neonatal nurses should maintain current NRP and S.T.A.B.L.E. provider status.

The nurse caring for neonatal patients in a Level II facility should be able to:

- I. Identify factors from an obstetric history which might cause fetal compromise and evaluate the neonate for physiologic distress.
  - A. Describe the physiologic changes in the mother which occur during labor.
  - B. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.
  - C. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.
  - D. Given maternal histories, identify maternal problems which might result in a preterm birth.
  - E. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.
  - F. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.
  - G. Describe appropriate antepartal and intrapartal fetal surveillance tests and interpret results.
  - H. Given a hypothetical situation, identify neonatal sequelae related to:
    1. placental abnormalities
    2. maternal hypertensive disorders
    3. maternal metabolic abnormalities (i.e., diabetes)
    4. maternal age
    5. maternal chemical dependency (prescribed vs abused)
    6. maternal social-sexual history
    7. preexisting maternal medical conditions
    8. maternal medications and anesthetics
    9. multiple gestation
    10. maternal smoking
  - I. Develop an appropriate neonatal plan of care based on an understanding of the maternal history.
- II. Discuss in detail fetal circulation and identify the physiologic changes that occur at birth.

- A. Using a diagram, trace blood through the entire fetal circulation and identify the sites of venous admixture that are unique to the fetus.
- B. Identify or describe the changes which occur at birth in the neonate's cardiovascular system and state the rationale for each change.
- C. State the role of the placenta in gas exchange.
- D. Describe maternal, fetal, and environmental factors which influence placental exchange.
- E. Explain the interrelationships of blood flow, pressure and resistance.
- F. List the effects of the following on resistance in all vascular beds:
  - 1. pH
  - 2.  $PO_2/SaO_2$
  - 3.  $PCO_2$
  - 4. prostaglandins

III. Manage the newborn's transition to extrauterine life.

- A. Manage early transition and resuscitation as specified in the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP.
- B. Given patient situations, develop a plan of care that would allow early recognition and management of sequelae from asphyxia and cardiopulmonary resuscitation, including consultation and referral when indicated.
  - 1. Cord clamping per unit policy
  - 2. Identify babies who may be candidates for neuroprotective hypothermia.
- C. Develop a management plan for the moderately ill neonate that would enhance transition from the fetal cardiopulmonary circuit to the neonatal cardiopulmonary circuit.

IV. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.

- A. Identify factors that influence the homeostatic range for the following during neonatal life:
  - 1. temperature
  - 2. heart rate
  - 3. respiratory rate and pattern
  - 4. color
  - 5. oxygen saturation
  - 6. blood pressure
  - 7. hematocrit/hemoglobin
  - 8. blood glucose

- B. When given a neonate to assess, identify normal physical characteristics and common variations related to:
1. body contour, proportions, and posture
  2. head (including occipital frontal circumference, names of fontanelles and sutures)
  3. face (including mouth and nose)
  4. eyes
  5. ears
  6. skin
  7. chest
  8. abdomen
  9. genitalia and rectum
  10. extremities
  11. vertebral column
  12. reflexes
- C. When given a neonate to assess:
1. identify, describe, and locate point of maximal impulse of the heart
  2. count and record apical heart rate
  3. identify obvious heart murmurs
  4. auscultate the lungs to identify normal and abnormal breath sounds
  5. identify flaring of the nostrils, retractions, grunting, inspiratory stridor, apnea, and choanal atresia, and relate the significance of these findings to problems experienced by the neonate
  6. identify placement and strength of brachial and femoral pulses
  7. describe abdominal girth and shape, stooling pattern, and voiding pattern
  8. describe skin turgor, texture, color, and perfusion
  9. describe level of consciousness, activity / tone, and comfort / pain
  10. measure and record vital signs
  11. measure and record blood glucose
  12. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings
- D. Describe appropriate ways of obtaining blood samples from a variety of sites which optimize accurate lab results and minimize complications for the newborn.
- E. Establish a plan for stabilization of all infants and appropriate management of moderately ill infants utilizing the NRP and S.T.A.B.L.E. Program resources.
- F. Describe an education plan that includes infant assessment by the parent / caregiver at home.
- V. Accurately determine the gestational age of a neonate by using a standardized scoring system.
- A. Define the following terms:
1. early term, full term, and late term neonate
  2. preterm neonate

3. late preterm neonate
  4. post-term neonate
  5. small for gestational age (symmetric and asymmetric)
  6. intrauterine growth restriction (IUGR) (symmetric and asymmetric)
  7. large for gestational age
  8. appropriate for gestational age
  9. low birth weight
  10. very low birth weight
- B. Define the significance of symmetry in maturity and growth of the neonate.
  - C. Identify those factors in a maternal history which may increase risk for growth and gestational age complications.
  - D. Determine the gestational age of a neonate.
  - E. Determine a neonate's growth classification by plotting the birthweight, head circumference, and length on the growth chart.
  - F. State the major implications of abnormal intrauterine growth.
  - G. Given a variety of patient gestational ages and growth parameters, develop a plan of care which reflects consideration of these issues, including the need for consultation and referral as appropriate.
- VI. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.
- A. Define neutral thermal balance.
  - B. List the physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.
  - C. List the modes of heat transfer in the neonate, give an example of each, and identify interventions to decrease heat transfer by each of the modes.
  - D. When given a patient situation (i.e., bathing, etc.), identify measures to promote a neutral thermal environment.
  - E. Describe the physiologic processes by which the neonate attempts to maintain body temperature.
  - F. List major physiologic problems which may result from hypo- and hyperthermia.
  - G. Identify optimal skin, axillary, and core temperatures for neonates.
  - H. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.
  - I. Compare and contrast methods of providing external heat for the neonate, including:

1. skin-to-skin care
  2. warm, draft free room (operating, delivery, nursery, NICU)
  3. incubator
  4. radiant warmer
  5. servo-control
  6. manual control
  7. heat packs and mattresses
  8. polyethylene wraps or bags
- J. Describe safe methods of increasing and decreasing a neonate's temperature.
- K. Identify factors other than body temperature which may indicate the status of the neonate's thermal balance.
- L. Utilize theoretical knowledge of thermoregulation to provide an optimal ambient temperature, relative humidity and wind velocity for the neonate.
- M. Utilize all thermoregulation equipment safely.
- N. Describe appropriate long-term thermal management of the neonate, including weaning from warmer to incubator or incubator to crib.
- O. Discuss with the receiving facility the possible need and methods for passive cooling in a baby who is being transferred for neuroprotective hypothermia.
- P. Describe an education plan that includes appropriate temperature assessment and management by the parents.
- VII. Manage the neonate's fluid and nutritional needs based upon gestational age.
- A. Calculate the fluid and caloric needs of the neonate based upon weight, age, physiologic problems, and rate of growth. Anticipate and provide appropriate interventions (i.e., transepidermal water loss).
  - B. Calculate the appropriate protein, fat, carbohydrate, mineral, and vitamin content needed by a neonate. Anticipate and provide appropriate interventions.
  - C. Discuss the indications and contraindications for enteral feeding.
  - D. When total oral feeding is not an option, develop a plan of care to meet fluid, electrolyte, and nutritional needs.
  - E. Describe the appropriate use and preparation of human milk, supplements, and commercial formula to meet fluid, nutrient, mineral, and vitamin requirements of neonates.
  - F. Encourage, promote and support early breast feeding or collection of breast milk for infants who are transferred to another hospital.

- G. Teach and assess basic breastfeeding techniques, including latch, milk transfer, hand expression, and safe milk storage.
  - H. Describe techniques for encouraging optimal feeding and nutrition of the term and preterm neonate. Utilize the services of a lactation consultant as appropriate.
  - I. Evaluate a neonate's postnatal growth using a postnatal growth chart and identify appropriate management responses.
  - J. Develop a plan to teach parents appropriate oral nutrient and fluid sources and indications that consultation is necessary to alter oral intake after discharge.
- VIII. Select the most appropriate technique for feeding the high-risk infant.
- A. List advantages and disadvantages of continuous gastric, intermittent gastric, nipple, and breast feeding based on knowledge of the infant's physiologic status, gestational age, and weight.
  - B. Describe safe and effective procedures for feeding infants receiving continuous gastric, intermittent gastric, gastrostomy, breast and/or nipple feedings.
  - C. Recognize and report signs of feeding intolerance and differentiate care-related problems from actual changes in the infant's clinical status.
  - D. Describe the correlation of blood glucose levels to the neonate's feeding regimen.
  - E. List measures to decrease oxygen consumption, trauma, infection, air ingestion, vomiting, and aspiration in relationship to feeding techniques.
  - F. Describe methods for assisting the mother of a infant with feeding techniques.
- IX. Correctly administer intravenous fluids.
- A. Calculate the fluid needs of the neonate, based upon weight, age, and physiologic status.
  - B. Describe care-related causes of the following:
    - 1. overhydration
    - 2. underhydration
    - 3. infection at intravascular sites
    - 4. clotting of intravascular lines
    - 5. hemorrhage
    - 6. hypoglycemia
    - 7. hyperglycemia
    - 8. infiltration
    - 9. embolism
    - 10. thrombosis

- C. Describe nursing measures that will enhance the positive effects and minimize the side effects of the following:
  - 1. glucose and electrolyte solutions
  - 2. umbilical venous and arterial lines
  - 3. peripheral intravenous lines
  - 4. peripherally inserted central catheter (PICC lines)
  
- X. Anticipate and identify fluid and electrolyte imbalance in the sick neonate.
  - A. Define fluid and electrolyte loads for moderately ill neonates.
  - B. Recognize clinical histories, major signs, laboratory values, and appropriate intervention for the following:
    - 1. shock
    - 2. insensible water loss
    - 3. Syndrome of Inappropriate Anti-Diuretic Hormone Secretion (SIADH)
    - 4. renal insufficiency or failure
    - 5. moderate sodium and potassium imbalance
  - C. Recognize abnormal electrolyte values and differentiate those abnormal values which require immediate medical intervention from those which require more frequent or thorough assessment without immediate intervention.
  
- XI. Apply knowledge of acid-base balance in the management of the moderately ill newborn.
  - A. Identify pathophysiologic changes which result from acidosis and alkalosis.
  - B. Define the terms: pH, acid, base, base excess, and buffer.
  - C. Describe how blood, respiratory, and renal buffers compensate for acid-base imbalance.
  - D. Identify acceptable neonatal parameters for blood gas values (pH, PO<sub>2</sub>, PCO<sub>2</sub>, HCO<sub>3</sub>, base excess, and pre / post oxygen saturation).
  - E. Discuss the clinical significance of blood gases obtained from various sites.
  - F. Differentiate normal from abnormal blood gases that require a change in therapy.
  - G. Recognize blood gas reports that indicate the following with the assistance of the S.T.A.B.L.E. blood gas nomogram:
    - 1. compensated and uncompensated metabolic acidosis
    - 2. compensated and uncompensated metabolic alkalosis
    - 3. compensated and uncompensated respiratory acidosis
    - 4. compensated and uncompensated respiratory alkalosis
    - 5. mixed metabolic and respiratory imbalances

- H. Describe the relationship of the following to acid-base balance (pH) and measures to optimize each factor.
1.  $PO_2$ ,  $PCO_2$ , base excess
  2. diffusion gradient/ $O_2$  and  $CO_2$  sources
  3. respiratory rate/drive
  4. functional residual capacity (FRC)/air trapping/atelectasis
  5. tidal volume/diffusing surface
  6. blood flow
  7. Hgb function
  8. nutrient metabolism
  9. infant and ambient temperature
  10. infant activity and sleep pattern
  11. urinary and GI losses
- XII. Apply knowledge of respiratory physiology in the management of newborns with respiratory disorders.
- A. List physiologic events which must occur at birth in order for the lungs to function postnatally and list factors responsible for each event.
  - B. Describe nursing measures which would enhance cardiopulmonary function at birth.
  - C. Describe physiologic factors in the premature infant which limit respiratory function at birth.
  - D. Describe the etiology of the pathophysiologic changes which occur in the following: respiratory distress syndrome, transient tachypnea of the newborn, apnea of prematurity, air leak syndromes, pneumonia, aspiration syndromes, and persistent pulmonary hypertension of the newborn.
  - E. Describe specific observations and radiologic findings which may assist in identifying the problems listed above.
  - F. Recognize indications for supplemental oxygen, continuous positive airway pressure (CPAP), intubation, and assisted ventilation.
  - G. Describe safe management of current modes of oxygen support, CPAP, endotracheal tube, laryngeal mask airway, chest physiotherapy, airway suction, and air leaks.
  - H. Describe a plan for the safe use of respiratory monitoring and support devices in collaboration with respiratory therapy staff.
  - I. Identify and define common terms associated with ventilator therapy.
  - J. Describe safe methods of adjusting respiratory support based on the clinical condition of the neonate, oxygen saturation, blood gases, and radiologic findings.

- XIII. Demonstrate theoretical knowledge of the most common cardiac disorders that occur during the newborn period.
- A. Describe common cyanotic and acyanotic heart defects in the newborn period.
  - B. Describe the physiologic problems associated with patent ductus arteriosus.
  - C. Identify the data base which is necessary to differentiate heart disease from respiratory disease.
  - D. Describe the indications, mechanism of action, and side effects of common pharmacologic agents used in the management of cardiopulmonary disease.
  - E. Explain the rationale for critical congenital heart disease (CCHD) screening and perform appropriately.
  - F. Describe stabilization measures necessary for the neonate who is being transported for further cardiac evaluation and / or care.
- XIV. Plan, provide, and evaluate the nursing care of newborns with hematologic disorders.
- A. Identify normal neonatal values for the following tests:
    - 1. hematocrit
    - 2. hemoglobin
    - 3. platelets
    - 4. bilirubin (total and direct)
    - 5. reticulocyte count
    - 6. Coombs test
    - 7. normal circulating blood volume
    - 8. red cell morphology
    - 9. G6PD
  - B. Correlate lab data with sampling technique, infant's pathology, gestational age, weight, and treatment, and report immediately any unusual findings.
  - C. Discuss each of the following disease processes, including etiology, signs, laboratory data, and management plan:
    - 1. Rh and ABO incompatibility
    - 2. acute anemia
    - 3. chronic anemia
    - 4. thrombocytopenia
    - 5. pathologic jaundice
    - 6. breast feeding and human milk jaundice
    - 7. physiologic jaundice
    - 8. vitamin K deficiency
    - 9. polycythemia
    - 10. DIC

- D. Describe the pathophysiologic changes that may be responsible for intravascular hemolysis, extravascular hemolysis, and impaired hepatic function as related to hyperbilirubinemia.
  - E. Describe those factors that increase the risk of neurotoxicity due to hyperbilirubinemia.
  - F. Describe briefly the mechanism by which phototherapy decreases bilirubin levels.
  - G. Describe methods of providing phototherapy using the devices available at your hospital that will enhance the positive effects and diminish the side effects of this therapy.
  - H. Describe indications for transfusions, exchange transfusions, and partial volume exchange transfusions.
  - I. Describe the appropriate use of pharmacologic agents for hematologic disorders when indicated.
  - J. Describe signs, laboratory values, and treatment requirements that would indicate the need for consultation or transfer.
  - K. Recognize the components of and the rationale for newborn hemoglobinopathy screening in the state of Tennessee and perform appropriately.
- XV. Plan, provide, and evaluate the nursing care of newborns with selected metabolic disorders.
- A. Describe the normal pattern of serum glucose changes in the newborn period and utilize this information in planning glucose screens for term and preterm neonates.
  - B. Identify infants at risk for abnormalities in glucose metabolism and plan glucose screening appropriate to the risk factor.
  - C. Describe a safe and effective treatment plan for moderately ill infants who have abnormal glucose metabolism.
  - D. Identify abnormal serum calcium and magnesium levels from lab reports and differentiate those that require intervention from those which should be further monitored.
  - E. Demonstrate awareness of rare metabolic disorders which require immediate consultation and/or referral.
  - F. List the components of and the rationale for newborn metabolic screening in the state of Tennessee and perform appropriately. Discuss situations where metabolic screening before 24 hours of age is required (such as babies requiring transfer to a higher level of care or a blood transfusion).

- XVI. Plan, provide, and evaluate the nursing care of newborns with gastrointestinal disorders.
- A. Characterize the functional limitations of the preterm and term neonate's gastrointestinal tract.
  - B. List major clinical signs of gastrointestinal dysfunction.
  - C. Identify problems outside the gastrointestinal tract which will alter digestion, absorption, and motility.
  - D. When given a patient situation, differentiate between signs of upper and lower gastrointestinal obstructions.
  - E. When given a hypothetical situation, identify therapeutic measures that will alleviate or diminish gastrointestinal problems.
  - F. Describe signs of pathology which would indicate the need for:
    - 1. no feedings (NPO)
    - 2. holding feedings
    - 3. gastric aspiration
    - 4. intermittent GI suction
    - 5. hematest on stools
    - 6. reducing substances test on stools
    - 7. suppository
    - 8. changing of infant's position
    - 9. protective sterile covering of exposed organs
  - G. Discuss the pathogenesis and emergent management of necrotizing enterocolitis, intestinal obstructions, and congenital anomalies of the gastrointestinal tract.
  - H. Describe a teaching plan that would assist parents in notifying the health care provider appropriately about gastrointestinal dysfunction after discharge.
- XVII. Identify common sources of perinatal infections, clinical indications of infections, and methods to prevent health care associated infections.
- A. Describe a management plan that limits the spread of infection as described in unit policy.
  - B. Identify major pathways of congenital and health care associated infections and initiate isolation according to unit policy.
  - C. Explain the importance of conscientious handwashing / hand sanitizing and use of universal precautions by staff, parents, and visitors to prevent health care associated infections.
  - D. Utilize maternal history, birth history, clinical presentation, and serial laboratory results as a basis for planning neonatal infectious disease screening and management.

- E. Identify signs of localized and systemic congenital and health care associated infections in the neonate.
  - F. Describe how the neonate's immature immune system is a predisposition for infection and affects laboratory values.
  - G. Identify those clinical signs and / or laboratory values related to screening for infection that require immediate intervention as opposed to monitoring.
  - H. Describe a safe and effective stabilization/referral plan for the neonate experiencing or at risk for sepsis utilizing the current S.T.A.B.L.E. Program resources.
- XVIII. Plan and implement measures to protect neurosensory function and to evaluate the infant's response to care.
- A. Describe major differences in the neurologic function of the newborn.
  - B. Identify disorders outside the nervous system which alter function of the nervous system.
  - C. Describe and implement a comprehensive assessment plan which will provide for prevention, early identification, and prompt treatment of sensory neural disorders.
    - 1. reflexes
    - 2. posture
    - 3. activity and movement
    - 4. level of consciousness
    - 5. rest and sleep
    - 6. comfort, irritability, pain
    - 7. vision
    - 8. hearing
  - D. Identify and describe seizure activity and delineate a plan for safe administration of anticonvulsants.
  - E. Briefly describe signs, stabilization techniques, and prognosis of:
    - 1. microcephaly
    - 2. major chromosomal abnormalities (Trisomy 13-15, 18, 21)
    - 3. congenital and acquired hydrocephaly
    - 4. infection of the central nervous system (prenatal and postnatal)
    - 5. neural tube defects
    - 6. intracranial hemorrhage
    - 7. neurologic sequelae of drugs, hypoxic-ischemic circulation, acid-base imbalance, electrolyte imbalance, and metabolic disorders
    - 8. cerebral edema with or without inappropriate ADH

- F. Describe an education plan that includes parent recognition of appropriate sensory neural function, necessity for continuing medical assessment, and interventions appropriately used by nursing staff and parents.
- XIX. Assess and manage the infant with suspected neonatal abstinence syndrome (NAS).
- A. Identify the infant at risk for NAS.
  - B. Describe signs of NAS.
  - C. Demonstrate use of appropriate NAS scoring system.
  - D. Describe non-pharmacologic and pharmacologic management of NAS.
  - E. Describe hospital policy regarding the mandatory reporting of NAS cases to the Tennessee Department of Health.
- XX. Utilize knowledge of neonatal pharmacology to optimize desired drug actions and minimize side effects, including the appropriate use of oral sucrose for pain management.
- XXI. Describe nursing interventions that promote appropriate development in newborns and how families can continue to support this after discharge.
- XXII. Describe a management and education plan that promotes infant safety in the hospital and the community. One place where information can be located is the AAP “parenting corner” section on their Healthy Children website. The website can be accessed at [www.HealthyChildren.org](http://www.HealthyChildren.org). Topics addressed in the “parenting corner” include, among others, the following:
- A. Routine discharge plans and follow-up care as determined by health care provider
  - B. Bathing and skin care
  - C. Cord care
  - D. Care of circumcised and uncircumcised infants
  - E. Conscientious hand washing / hand sanitizing and appropriate hygiene
  - F. Immunizations per current recommendations from the American Academy of Pediatrics. RSV prevention should be discussed.
  - G. Falls
  - H. Burns (including sunburn)
  - I. Safe sleep

- J. Emergency preparedness / disaster planning (examples are infant security, Code Pink, evacuation, etc.)
  - K. Infant restraint device / institutional policy regarding car seat tolerance testing
  - L. According to state statute (TCA), at least one infant parent or caregiver must receive information regarding infant CPR before discharge from the hospital. Tennessee Hospital Association member hospitals have been granted permission to refer caregivers to the website [www.learncpr.org](http://www.learncpr.org).
  - M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect
  - N. Reasons for avoiding second hand smoke around infants and children
  - O. Reasons to contact the baby's primary care provider (respiratory distress, no stool in 24 hours, decreased urine output, refusal to feed, change in activity, abnormal temperature, etc.)
- XXII. Utilize culturally-appropriate parent-infant attachment concepts in dealing with families of sick newborns.
- A. Identify prenatal and postnatal factors which may influence parental attachment and caretaking.
  - B. Recognize and describe behaviors which indicate the status of parent-infant attachment, including the significance of these behaviors.
  - C. Recognize and describe the stages of emotional stress and the grief process. This includes both families dealing with an infant loss and those dealing with an infant requiring palliative care.
  - D. Describe how emotional stress and the grief process may influence family relationships.
  - E. Plan and implement nursing measures which will appropriately facilitate and support completion of the grief process.
  - F. Describe how attitudes of "significant others" influence parental attachment.
  - G. Plan and implement nursing measures which will facilitate culturally-appropriate parent-infant interaction.
  - H. Identify and utilize community resources for various aspects of home care support after discharge.
- XXIII. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.
- A. Describe the interactive roles of health care disciplines in providing care to neonates and their families.

- B. Identify common indications for consultation regarding care and/or transport of the high- risk neonate utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
- C. Describe the process for initiating consultation/referral with the appropriate referral center.
- D. Outline stabilization measures commonly used either prior to or during transport utilizing the S.T.A.B.L.E. mnemonic.

**OBSTETRIC OBJECTIVES FOR  
NURSES IN LEVEL III FACILITIES**

## OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL III FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

The nurse caring for obstetric patients in a Level III facility should be able to:

### PRECONCEPTION

- I. Demonstrate an understanding of significant issues related to the preconception period.
  - A. Describe the anatomy and physiology of the non-pregnant reproductive system.
  - B. Describe the menstrual cycle.
  - C. Explain the process of conception, including fertilization and implantation.
  - D. Identify indications for preconception counseling, including both medical and genetic factors.
  - E. Describe therapeutic modalities commonly employed in the treatment of infertility.
  - F. Identify the psychosocial impact of a history of infertility on the couple experiencing a subsequent pregnancy.

### PRENATAL

- II. Demonstrate an understanding of significant issues related to the prenatal period.
  - A. Describe maternal physiologic changes of pregnancy by both body system and trimester of pregnancy.
  - B. Identify alterations in laboratory values associated with both low and high-risk pregnancy.
  - C. Describe psychosocial adaptations made by the family to both normal and high-risk pregnancy.
  - D. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.
  - E. Explain the benefits of breastfeeding for mother and baby.
  - F. Discuss the importance of good nutrition in pregnancy.
  - G. Explain the maternal and fetal effects of substance use/abuse during pregnancy.

- H. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the pregnancy history, laboratory data, and physical assessment.
- I. Identify indications for and the significance and interpretation of currently used and newly developing maternal-fetal assessment techniques. Examples are:
  - 1. high resolution ultrasound
  - 2. chromosomal evaluation
  - 3. non-invasive prenatal testing
  - 4. maternal assays using multiple marker screens
  - 5. non-stress test
  - 6. biophysical profile
  - 7. doppler flow studies
  - 8. percutaneous umbilical blood sampling (PUBS)
- J. Describe indications for and the management of patients receiving currently used and newly developing fetal therapy techniques. Examples include:
  - 1. open procedure to repair neural tube defects
  - 2. needle procedures, such as intrauterine transfusion, bladder stent placement, thoracentesis, and skin biopsy
  - 3. amnioexchange for gastroschisis
- K. Explain the importance of screening for intimate partner violence in the pregnant woman.
- L. Identify components which should be included in comprehensive prenatal and childbirth education.
- M. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.
- N. Identify indications and resources for prenatal referral.

## **INTRAPARTAL**

- III. Demonstrate an understanding of significant issues related to the intrapartal period.
  - A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.
  - B. Describe the stages and phases of labor.
  - C. Describe maternal physiologic and psychologic responses to labor.
  - D. Evaluate the fetal response to labor.

- E. Evaluate and promote maternal and fetal well-being, based on assessment of fetal monitor tracings, utilizing the NICHD terminology currently recommended by ACOG and AWHONN.
- F. Demonstrate unit-based competency in interpretation and intervention regarding electronic fetal monitor tracings.
- G. Outline appropriate emotional and physical support for the laboring woman and significant others.
- H. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia.
- I. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.
- J. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:
  - 1. premature labor
  - 2. premature rupture of membranes
  - 3. cardiovascular abnormalities
  - 4. endocrine abnormalities
  - 5. neurologic abnormalities
  - 6. renal abnormalities
  - 7. hepatic abnormalities
  - 8. pulmonary abnormalities
  - 9. hematologic abnormalities
  - 10. infectious diseases
  - 11. acute obstetric emergencies
  - 12. placental abnormalities (e.g., accreta, increta, percreta, and previa)
  - 13. trauma
  - 14. obesity (based on BMI)
- K. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.
- L. Describe nursing management of the critically ill obstetric patient who requires the use of high-tech equipment and procedures. Examples are:
  - 1. electrocardiogram interpretation
  - 2. arterial blood gas interpretation
  - 3. mechanical ventilation
  - 4. arterial line placement
  - 5. hemodynamic monitoring
- M. Explain the role of the nurse in assisting with the spontaneous or operative vaginal delivery.
- N. Describe appropriate procedure for initial assessment and resuscitation of the newborn as specified by the most recent edition of the *Textbook of Neonatal*

*Resuscitation* published by AHA and AAP, incorporating skin-to-skin as appropriate, based on maternal and newborn condition.

- O. Identify the legal implications of perinatal nursing, including appropriate documentation.
- P. Identify indications and resources for intrapartal referral.

## **POSTPARTAL**

- IV. Demonstrate an understanding of significant issues related to the postpartal period.
  - A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, laboratory data, and a physical assessment.
  - B. Describe maternal physiologic and psychologic adaptation to the postpartal period.
  - C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.
  - D. Outline emotional and physical support necessary for the postpartal woman and her significant others.
  - E. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.
  - F. Identify measures to promote infant safety, including safe sleep, during and after the hospital stay.
  - G. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.
  - H. Describe the risks and benefits of various methods of contraception.
  - I. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.
  - J. Recognize the stages of grief and support the family during the process.
    - 1. Identify normal and pathologic responses to grief.
    - 2. Describe techniques of intervention with families experiencing grief.
    - 3. Institute appropriate referrals as necessary.
  - K. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.
  - L. Assess, stabilize, and manage the newborn after delivery.

## CONSULTATION/REFERRAL

- V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.
  - A. Identify common indications for consultation regarding care and/or transport of the high- risk mother or fetus utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - B. Describe the process of initiating consultation/referral with the Regional Perinatal Center.
  - C. Outline stabilization measures commonly used either prior to or during transport.

**NEONATAL OBJECTIVES FOR  
NURSES IN LEVEL III FACILITIES**

## NEONATAL OBJECTIVES FOR NURSES IN LEVEL III FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

All neonatal nurses should maintain current NRP and S.T.A.B.L.E. provider status.

The nurse caring for neonatal patients in a Level III facility should be able to:

- I. Identify factors from an obstetric history which might cause fetal compromise and evaluate the neonate for physiologic distress.
  - A. Describe the physiologic changes in the mother which occur during labor.
  - B. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.
  - C. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.
  - D. Given maternal histories, identify maternal problems which might result in a preterm birth.
  - E. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.
  - F. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.
  - G. Describe appropriate antepartal and intrapartal fetal surveillance tests and interpret results.
  - H. Given a hypothetical situation, identify neonatal sequelae related to:
    1. placental abnormalities
    2. maternal hypertensive disorders
    3. maternal metabolic abnormalities (i.e., diabetes)
    4. maternal age
    5. maternal chemical dependency (prescribed vs abused)
    6. maternal social-sexual history
    7. preexisting maternal medical conditions
    8. maternal medications and anesthetics
    9. multiple gestation
    10. maternal smoking
- II. Develop an appropriate neonatal plan of care based on an understanding of the maternal history.
- III. Discuss in detail fetal circulation and identify the physiologic changes that occur at birth.

- A. Using a diagram, trace blood through the entire fetal circulation and identify the sites of venous admixture that are unique to the fetus.
  - B. Identify or describe the changes which occur at birth in the neonate's cardiovascular system and state the rationale for each change.
  - C. State the role of the placenta in gas exchange.
  - D. Describe maternal, fetal, and environmental factors which influence placental exchange.
  - E. Explain the interrelationships of blood flow, pressure and resistance.
  - F. List the effects of the following on resistance in all vascular beds:
    - 1. pH
    - 2. PO<sub>2</sub>/SaO<sub>2</sub>
    - 3. PCO<sub>2</sub>
    - 4. Prostaglandins
    - 5. Inhaled nitric oxide (iNO)
    - 6. Indomethacin / Ibuprofen
    - 7. Blood volume secondary to timing of cord clamping
- IV. Manage the newborn's transition to extra uterine life.
- A. Manage early transition and resuscitation as specified in the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP.
  - B. Given patient situations, develop a plan of care that would allow early recognition and long-term management of sequelae from asphyxia and cardiopulmonary resuscitation, including consultation and referral when indicated.
    - 1. Cord clamping per unit policy
    - 2. Identify and / or provide neuroprotective hypothermia to appropriate babies
  - C. Develop a management plan for all neonates that would enhance transition from the fetal cardiopulmonary circuit to the neonatal cardiopulmonary circuit.
- V. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.
- A. Identify factors that influence the homeostatic range for the following during neonatal life:
    - 1. temperature
    - 2. heart rate
    - 3. respiratory rate and pattern
    - 4. color
    - 5. oxygen saturation

6. blood pressure
  7. hematocrit/hemoglobin
  8. blood glucose
- B. When given a neonate to assess, identify normal physical characteristics and common variations related to:
1. body contour, proportions, and posture
  2. head (including occipital frontal circumference, names of fontanelles and sutures)
  3. face (including mouth and nose)
  4. eyes
  5. ears
  6. skin
  7. chest
  8. abdomen
  9. genitalia and rectum
  10. extremities
  11. vertebral column
  12. reflexes
- C. When given a neonate to assess:
1. identify, describe, and locate point of maximal impulse of the heart
  2. count and record apical heart rate and respiratory rate
  3. identify heart murmurs
  4. auscultate the lungs and describe breath sounds
  5. identify flaring of the nostrils, retractions, grunting, inspiratory stridor, apnea, and choanal atresia, and relate the significance of these findings to problems experienced by the neonate
  6. identify the presence, strength, and equality of all pulses
  7. describe abdominal girth and shape, stooling pattern, and voiding pattern
  8. describe skin turgor, texture, color, and perfusion
  9. describe level of consciousness, activity / tone, and comfort / pain
  10. evaluate central and peripheral blood pressure
  11. measure and record blood glucose
  12. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings
- D. Describe appropriate ways of obtaining blood samples from a variety of sites which optimize accurate lab results and minimize complications for the newborn.
- E. Establish a plan for stabilization and appropriate management of all infants, including those who are critically ill utilizing the NRP and S.T.A.B.L.E. Program resources.
- F. Describe an education plan that includes infant assessment by the parent / caregiver at home.

- VI. Appropriately utilize the neonate's gestational age and fetal growth pattern in managing care.
- A. Define the following terms:
    1. early term, full term, and late term neonate
    2. preterm neonate
    3. late preterm neonate
    4. post-term neonate
    5. small for gestational age (symmetric and asymmetric)
    6. intrauterine growth restriction (IUGR) (symmetric and asymmetric)
    7. large for gestational age
    8. appropriate for gestational age
    9. low birth weight
    10. very low birth weight
    11. extremely low birth weight
  - B. Define the stages of fetal cellular growth and identify developmental problems associated with interference in each stage.
  - C. Identify infants at increased risk for growth and gestational age complications based upon maternal history.
  - D. Determine the gestational age of a neonate by utilizing a standardized scoring system.
  - E. Determine a neonate's growth classification by plotting the birth weight, head circumference, and length on an intrauterine growth chart and interpret significance.
  - F. State the implications of abnormal intrauterine growth and of non-term birth.
  - G. Given a variety of patient gestational ages and growth parameters, develop a plan of care which reflects consideration of these issues.
- VII. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.
- A. Define neutral thermal balance.
  - B. List the physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.
  - C. List the modes of heat transfer in the neonate, give an example of each, and identify interventions to decrease heat transfer by each of the modes.
  - D. When given a patient situation (i.e., surgery, special procedures, etc.), identify measures to promote a neutral thermal environment.
  - E. Describe the physiologic processes by which the neonate attempts to maintain body temperature.

- F. List the physiologic problems which may result from hypo- and hyperthermia.
  - G. Identify optimal skin, axillary, and core temperatures for both premature and term neonates.
  - H. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.
  - I. Compare and contrast methods of providing external heat for the neonate, including:
    - 1. skin-to-skin care
    - 2. warm, draft free room (operating, delivery, transport, nursery, NICU)
    - 3. incubator
    - 4. radiant warmer
    - 5. servo-control
    - 6. manual control
    - 7. heat packs and mattresses
    - 8. polyethylene wraps or bags
    - 9. appropriate use of humidity
  - J. Describe safe methods of increasing and decreasing a neonate's temperature.
  - K. Identify factors other than body temperature which may indicate the status of the neonate's thermal balance.
  - L. Utilize theoretical knowledge of thermoregulation to provide an optimal ambient temperature, relative humidity and wind velocity for the neonate.
  - M. Utilize all thermoregulation equipment safely.
  - N. Describe appropriate long-term thermal management of the neonate, including weaning from warmer to incubator or incubator to crib.
  - O. Utilize head/body cooling if indicated per unit policy.
  - P. Describe an education plan that includes appropriate temperature assessment and management by the parents.
- VIII. Manage the neonate's fluid and nutritional needs to promote optimal growth.
- A. Calculate the fluid and caloric needs of the neonate based upon weight, age, physiologic problems, and rate of growth. Anticipate and provide appropriate interventions, (i.e., transepidermal water loss).
  - B. Calculate the appropriate protein, fat, carbohydrate, mineral, and vitamin content for neonates of various gestational ages and weights. Anticipate and provide appropriate interventions.
  - C. Discuss the indications and contraindications for initiating or continuing feeding.

- D. When total oral feeding is not an option, develop a plan of care to meet fluid, electrolyte, and nutritional needs, including the use of hyperalimentation and intralipid therapy.
  - E. Describe the advantages, disadvantages, and potential complications of varying the concentration of commercial formulas.
  - F. Describe the appropriate use and preparation of human milk, supplements, and commercial formula to meet fluid, nutrient, mineral, and vitamin requirements of neonates.
  - G. Encourage, promote and support early breast feeding or collection of breast milk for infants, including those who may be transferred.
  - H. Teach and assess basic breastfeeding techniques, including latch, milk transfer, hand expression, and safe milk storage.
  - I. Describe techniques for encouraging optimal feeding and nutrition of the term and preterm neonate. Utilize the services of a lactation consultant as appropriate.
  - J. Evaluate a neonate's postnatal growth using a postnatal growth chart and identify appropriate management responses.
  - K. Develop a plan to teach parents appropriate oral nutrient and fluid sources and indications that consultation is necessary to alter oral intake after discharge.
- IX. Select the most appropriate technique for feeding the high-risk infant.
- A. List advantages and disadvantages of continuous gastric, intermittent gastric, transpyloric, gastrostomy, and breast / bottle feeding based on knowledge of the infant's physiologic status, gestational age, and weight.
  - B. Describe safe and effective procedures for feeding infants receiving continuous gastric, intermittent gastric, gastrostomy, breast and/or nipple feedings.
  - C. Recognize and report signs of feeding intolerance and differentiate care-related problems from actual changes in the newborn's clinical status.
  - D. Describe the correlation of the newborn's clinical status to the feeding regimen.
  - E. List measures to decrease oxygen consumption, trauma, infection, air ingestion, vomiting, and aspiration in relationship to feeding techniques.
  - F. Describe methods for assisting the caretaker of a newborn with feeding techniques.
- X. Correctly administer intravenous fluids.

- A. Calculate the fluid needs of the neonate, based upon weight, age, and physiologic status.
  - B. Describe care-related causes of the following:
    - 1. overhydration
    - 2. underhydration
    - 3. infection at intravascular sites
    - 4. clotting of intravascular lines
    - 5. hemorrhage
    - 6. hypoglycemia
    - 7. hyperglycemia
    - 8. infiltration
    - 9. embolism
    - 10. thrombosis
  - C. Describe nursing measures that will enhance the positive effects and minimize the side effects of the following:
    - 1. glucose and electrolyte solutions, including total parenteral nutrition (TPN), intralipid therapy, and colloids
    - 2. umbilical venous and arterial lines
    - 3. peripheral venous and arterial lines
    - 4. peripherally inserted central catheter (PICC lines)
    - 5. surgically placed lines
- XI. Anticipate and identify fluid and electrolyte imbalance in the sick neonate.
- A. Define fluid and electrolyte requirements for all neonates.
  - B. Describe the following mechanisms for control of fluid and electrolyte balance:
    - 1. diffusion
    - 2. osmosis
    - 3. filtration
    - 4. sodium and potassium pump
    - 5. ADH control
    - 6. renin, angiotensin, aldosterone control
  - C. Recognize clinical histories, major signs, laboratory values, and clinical interventions for the following:
    - 1. electrolyte abnormalities
    - 2. fluid shifts
    - 3. overhydration
    - 4. dehydration
  - D. Given a clinical history, laboratory values, and physical assessment data, delineate an appropriate assessment and treatment plan for the conditions listed above.

- XII. Apply knowledge of acid-base balance in the management of the sick newborn.
- A. Identify pathophysiologic changes which result from acidosis and alkalosis.
  - B. Define the terms: pH, acid, base, base excess, and buffer.
  - C. Describe how blood, respiratory, and renal buffers compensate for acid-base imbalance.
  - D. Identify acceptable neonatal parameters for blood gas values (pH, PO<sub>2</sub>, PCO<sub>2</sub>, HCO<sub>3</sub>, base excess, and pre / post oxygen saturation).
  - E. Compare and contrast the clinical significance of respiratory gas information obtained from various sites.
  - F. Identify abnormal blood gases that require a change in therapy from those that require continued assessment without a change in therapy.
  - G. Recognize blood gas reports that indicate the following with the assistance of the S.T.A.B.L.E. blood gas nomogram.:
    - 1. compensated and uncompensated metabolic acidosis
    - 2. compensated and uncompensated metabolic alkalosis
    - 3. compensated and uncompensated respiratory acidosis
    - 4. compensated and uncompensated respiratory alkalosis
    - 5. mixed metabolic and respiratory imbalances
  - H. Describe the etiology of acid-base imbalances in relation to gain or loss of fixed acid, gain or loss of base, gain or loss of carbon dioxide.
  - I. Describe the relationship of the following to acid-base balance (pH) and measures to optimize each factor.
    - 1. PO<sub>2</sub>, PCO<sub>2</sub>, base excess
    - 2. diffusion gradient/O<sub>2</sub> and CO<sub>2</sub> sources
    - 3. respiratory rate/drive
    - 4. functional residual capacity (FRC)/air trapping/atelectasis
    - 5. tidal volume/diffusing surface/mean airways pressure/minute ventilation
    - 6. blood flow
    - 7. Hgb function
    - 8. nutrient supply / sources of acid and base
    - 9. infant and ambient temperature
    - 10. urinary and GI losses
  - J. Describe appropriate use of pharmacologic agents which alter acid-base balance.
- XIII. Apply knowledge of respiratory physiology in the management of newborns with respiratory disorders.

- A. Demonstrate a working knowledge of the terms used to describe respiratory pathology, pulmonary function, and respiratory support.
  - B. List physiologic events which must occur at birth in order for the lungs to function postnatally and list factors responsible for each event.
  - C. Describe physiologic factors which enhance or deter respiratory function.
  - D. Describe how surfactant influences establishment of functional residual capacity (FRC), including factors which may limit or enhance surfactant production.
  - E. Describe factors which influence the following:
    - 1. closure of fetal shunts
    - 2. pulmonary arteriolar dilation
    - 3. pulmonary vascular resistance
    - 4. cerebral blood flow
  - F. Describe medical and nursing measures which may enhance the establishment of respiration.
  - G. Describe physiologic factors in the newborn which may limit the establishment of normal respiration.
  - H. Describe the pathophysiologic changes in and etiology of neonatal respiratory disorders.
  - I. Describe gestational age, clinical presentation, pathophysiology, radiologic findings, and laboratory findings which would assist in differentiating specific neonatal respiratory disorders.
  - J. Describe the mechanism of action, side effects, and appropriate administration of pharmacologic agents (i.e., surfactants) used in the treatment of neonatal respiratory disorders.
  - K. Describe nursing management of neonates with respiratory disorders requiring surgical intervention.
- XIV. Describe appropriate measures for managing neonatal respiratory support systems.
- A. Describe the indications for and the mechanisms of operation of various respiratory support systems.
  - B. Demonstrate a thorough working knowledge of the neonatal respiratory support equipment used in the unit.
    - 1. Describe clinical indications and measures to diminish, identify, and treat the potential complications.
    - 2. Describe the types of ventilators used in the unit, including the terms used with respect to each.
    - 3. Discuss indications for and safe use of inhaled nitric oxide.

- C. Describe the possible complications which may be associated with respiratory support and develop a management plan to limit these complications.
  - D. Describe safe methods of adjusting respiratory support based on the clinical condition of neonate, blood gases, oxygen saturation, and radiologic findings.
- XV. Plan, provide, and evaluate the care of infants with cardiac disorders.
- A. Explain the embryogenesis of cardiac development.
  - B. Describe the cardiovascular pressure, resistance, and blood flow alterations resulting from cardiac disorders.
  - C. Describe common cyanotic and acyanotic heart defects in the newborn period.
  - D. Describe the physiologic problems associated with patent ductus arteriosus.
  - E. Identify the data base which is necessary to differentiate heart disease from respiratory disease.
  - F. Describe the indications for, the mechanism of action, and the side effects of common medications used in the treatment of cardiopulmonary disease. (i.e., prostaglandins).
  - G. Recognize major rate and rhythm abnormalities.
  - H. Explain the rationale for critical congenital heart disease (CCHD) screening and perform appropriately.
  - I. Describe the nursing care required by newborns undergoing uncomplicated cardiac surgical procedures, if available in the facility.
- XVI. Plan, provide, and evaluate the nursing care of newborns with hematologic disorders.
- A. Briefly describe hematopoiesis in the fetus / newborn.
  - B. Describe the characteristics which differentiate adult and fetal hemoglobin.
  - C. Describe normal neonatal coagulation.
  - D. Identify normal neonatal hematologic values.
  - E. Describe how the following factors may alter laboratory data:
    - 1. gestational age
    - 2. timing of cord clamping
    - 3. delivery technique
    - 4. blood volume
    - 5. transfusion
    - 6. exchange transfusion / partial volume exchange transfusion
    - 7. timing of sample

8. sampling technique
- F. Identify etiology, infants at risk, and management plan for:
    1. hemorrhage
    2. hemolytic disorders
    3. coagulation disorders
    4. thrombocytopenia
    5. polycythemia / hyperviscosity syndrome
    6. acute and chronic anemia
  - G. Describe the formation, transport, conjugation, and excretion of bilirubin.
  - H. Describe the pathophysiologic changes that may be responsible for intravascular hemolysis, extravascular hemolysis, and impaired hepatic function as related to hyperbilirubinemia.
  - I. Describe those factors that increase the risk of neurotoxicity due to hyperbilirubinemia.
  - J. Describe a nursing assessment plan that allows prompt recognition of abnormal bilirubin metabolism and a management plan that reduces the risk of neurotoxicity.
  - K. Describe a parent teaching plan that encourages prompt recognition and referral for jaundice in the community setting.
  - L. Recognize the components of and the rationale for newborn hemoglobinopathy screening in the state of Tennessee and perform appropriately.
- XVII. Plan, provide, and evaluate the nursing care of newborns with selected metabolic disorders.
- A. Describe glucose metabolism in the newborn period.
  - B. Describe how the following factors may alter serum glucose values:
    1. gestational age
    2. placental glucose transport
    3. hormones
    4. glycogen storage and release
    5. glucose intake and metabolism
    6. protein and fat intake
    7. enteral and parenteral nutrition
    8. aerobic vs anaerobic metabolism
    9. thermal status
    10. medications that alter glucose metabolism
  - C. Identify infants at risk for abnormalities in glucose metabolism and describe glucose screening plans appropriate to the risk factors.

- D. Describe management plans that maintain a safe serum glucose level and an appropriate growth pattern.
  - E. Identify abnormal serum calcium and magnesium levels from lab reports and differentiate those that require immediate intervention from those which should be further monitored.
  - F. Demonstrate awareness of rare inborn errors of metabolism.
  - G. List the components of and the rationale for newborn metabolic screening in the state of Tennessee and perform appropriately. Discuss situations where metabolic screening before 24 hours of age is required (such as babies requiring transfer to a higher level of care or a blood transfusion).
- XVIII. Plan, provide, and evaluate the nursing care of newborns with gastrointestinal disorders.
- A. Characterize the functional limitations of gestational age on the gastrointestinal tract.
  - B. List clinical signs of gastrointestinal dysfunction.
  - C. Identify circumstances which will alter digestion, absorption, and motility.
  - D. When given a patient situation, differentiate between signs of upper and lower gastrointestinal obstructions.
  - E. When given a clinical situation, identify therapeutic measures that will alleviate or diminish gastrointestinal problems.
  - F. Describe signs of pathology which would indicate the need for:
    - 1. no feedings (NPO)
    - 2. stopping /discontinuing feedings
    - 3. gastric aspiration
    - 4. intermittent gastric/GI suction
    - 5. hematest on stools
    - 6. reducing substances test on stools
    - 7. enema or suppository
    - 8. changing of infant's position
    - 9. sterile protective covering of exposed organs
    - 10. abdominal girth measurement
  - G. Discuss the pathogenesis, medical and surgical management, and nursing care of neonatal gastrointestinal disorders.
  - H. Describe a teaching plan that would assist parents in notifying the physician appropriately of gastrointestinal dysfunction after discharge.
- XIX. Identify common sources of perinatal infections, clinical indications of infections, and methods to prevent health care associated infections.

- A. Identify pathways of congenital and health care associated infections.
  - B. Utilize maternal history, birth history, clinical presentation, and serial laboratory results as a basis for planning neonatal infectious disease screening and management.
  - C. Describe signs of localized and systemic congenital and health care associated infections in the neonate.
  - D. Describe how the neonate's immune system response predisposes to infection and affects laboratory values.
  - E. Differentiate those laboratory values and signs related to screening for infection that require immediate intervention from those that require further monitoring.
  - F. Describe a safe and effective management plan for the neonate at risk for or experiencing infection.
  - G. Describe a management plan that limits the spread of infection as described in unit policy.
  - H. Describe a management plan that appropriately informs parents about immunizations, documents parental consent for immunizations, and provides immunizations at the appropriate time.
- XX. Plan and implement measures to protect sensory neural function and to evaluate the infant's response to care.
- A. Describe the central nervous system control of neurologic function according to gestational and postnatal age.
  - B. Identify disorders which alter function of the nervous system.
  - C. Describe and implement a comprehensive assessment plan which will provide for prevention, early identification and prompt treatment of sensory neural disorders.
    - 1. reflexes
    - 2. posture
    - 3. activity and movement
    - 4. level of consciousness
    - 5. rest and sleep pattern
    - 6. comfort, irritability, pain
    - 7. vision
    - 8. hearing
    - 9. appropriate positioning using developmental aids
  - D. Identify and describe seizure activity and delineate a plan for safe administration of prescribed anticonvulsants.
  - E. Identify the pathogenesis, recognition, prognosis, and patient management of:

1. microcephaly
  2. major chromosomal abnormalities (Trisomy 13-15, 18, 21)
  3. congenital and acquired hydrocephaly
  4. infection of the central nervous system (prenatal and postnatal)
  5. neural tube defects
  6. intracranial/ intraventricular hemorrhage and periventricular leukomalacia
  7. neurologic sequelae of drugs, hypoxia, acid-base imbalance, electrolyte imbalance, metabolic disorders, and thermoregulation disorders
  8. cerebral edema
  9. hypoxic-ischemic encephalopathy (HIE)
- F. Describe an education plan that includes parent recognition of appropriate sensory neural function for age, necessity for continuing medical and developmental assessment, and interventions appropriately used by parents.
- XXI. Assess and manage the infant with suspected neonatal abstinence syndrome (NAS).
- A. Identify the infant at risk for NAS.
  - B. Describe signs of NAS.
  - C. Demonstrate use of appropriate NAS scoring system.
  - D. Describe non-pharmacologic and pharmacologic management of NAS.
  - E. Describe hospital policy regarding the mandatory reporting of NAS cases to the Tennessee Department of Health.
- XXII. Utilize knowledge of neonatal pharmacology to optimize desired drug actions and minimize side effects.
- XXIII. Describe a management and education plan that promotes infant safety in the hospital and the community. One place where information can be located is the AAP “parenting corner” section on their Healthy Children website. The website can be accessed at [www.HealthyChildren.org](http://www.HealthyChildren.org). Topics addressed in the “parenting corner” include, among others, the following:
- A. Discharge plans and follow-up care as determined by health care provider
  - B. Bathing and skin care
  - C. Cord care
  - D. Care of circumcised and uncircumcised infants
  - E. Conscientious hand washing / hand sanitizing and appropriate hygiene
  - F. Immunizations per current recommendations from the American Academy of Pediatrics. RSV prevention should be taught to all parents. RSV prophylaxis should be provided as clinically indicated.

- G. Falls
  - H. Burns (sunburn)
  - I. Safe sleep
  - J. Emergency preparedness / disaster planning (examples are infant security, Code Pink, evacuation, etc.)
  - K. Infant restraint device / institutional policy regarding car seat tolerance testing
  - L. According to state statute (TCA), at least one infant parent or caregiver must receive information regarding infant CPR before discharge from the hospital. Tennessee Hospital Association member hospitals have been granted permission to refer caregivers to the website [www.learncpr.org](http://www.learncpr.org).
  - M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect
  - N. Reasons for avoiding second hand smoke around infants and children
  - O. Reasons to contact the baby's primary care provider (respiratory distress, no stool in 24 hours, decreased urine output, refusal to feed, change in activity, abnormal temperature, etc.)
- XXIV. Utilize culturally-appropriate parent-infant attachment concepts in dealing with families of sick newborns.
- A. Identify prenatal and postnatal factors which may influence parental attachment and caretaking.
  - B. Recognize and describe behaviors which indicate the status of parent-infant attachment, including the significance of these behaviors.
  - C. Recognize and describe the stages of emotional stress and the grief process. This includes both families dealing with an infant loss and those dealing with an infant receiving palliative care.
  - D. Describe how emotional stress and the grief process may influence family relationships.
  - E. Plan and implement nursing measures which will appropriately facilitate and support completion of the grief process.
  - F. Describe how attitudes of "significant others" influence parental attachment.
  - G. Plan and implement nursing measures which will facilitate culturally-appropriate parent-infant interaction.
  - H. Identify and utilize community resources for various aspects of home care support after discharge.

- XXV. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.
- A. Describe the interactive roles of health care disciplines in providing care to neonates and their families.
  - B. Identify common indications for consultation regarding care and/or transport of the high- risk neonate utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - C. Describe the process for initiating consultation/referral with the appropriate referral center.
  - D. Outline stabilization measures commonly used either prior to or during transport utilizing the S.T.A.B.L.E. guidelines.

**OBSTETRIC OBJECTIVES FOR  
NURSES IN LEVEL IV FACILITIES**

## OBSTETRIC OBJECTIVES FOR NURSES IN LEVEL IV FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

The nurse caring for obstetric patients in a Level IV facility should be able to:

### PRECONCEPTION

- I. Demonstrate an understanding of significant issues related to the preconception period.
  - A. Describe the anatomy and physiology of the non-pregnant reproductive system.
  - B. Describe the menstrual cycle.
  - C. Explain the process of conception, including fertilization and implantation.
  - D. Identify indications for preconception counseling, including both medical and genetic factors.
  - E. Describe therapeutic modalities commonly employed in the treatment of infertility.
  - F. Identify the psychosocial impact of a history of infertility on the couple experiencing a subsequent pregnancy.

### PRENATAL

- II. Demonstrate an understanding of significant issues related to the prenatal period.
  - A. Describe maternal physiologic changes of pregnancy by both body system and trimester of pregnancy.
  - B. Identify alterations in laboratory values associated with both low and high-risk pregnancy.
  - C. Describe psychosocial adaptations made by the family to both normal and high-risk pregnancy.
  - D. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.
  - E. Explain the benefits of breastfeeding for mother and baby.
  - F. Discuss the importance of good nutrition in pregnancy.
  - G. Explain the maternal and fetal effects of substance use/abuse during pregnancy.

- H. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the pregnancy history, laboratory data, and physical assessment.
- I. Identify indications for and the significance and interpretation of currently used and newly developing maternal-fetal assessment techniques. Examples are:
  1. high resolution ultrasound
  2. chromosomal evaluation
  3. non-invasive prenatal testing
  4. maternal assays using multiple marker screens
  5. non-stress test
  6. biophysical profile
  7. doppler flow studies
  8. percutaneous umbilical blood sampling (PUBS)
  9. interventional radiology
- J. Describe indications for and the management of patients receiving currently used and newly developing fetal therapy techniques. Examples include:
  1. open procedure to repair neural tube defects
  2. needle procedures, such as intrauterine transfusion, bladder stent placement, thoracentesis, and skin biopsy
  3. amnioexchange for gastroschisis
- K. Explain the importance of screening for intimate partner violence in the pregnant woman.
- L. Identify components which should be included in comprehensive prenatal and childbirth education.
- M. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.
- N. Identify indications and resources for prenatal referral.

## **INTRAPARTAL**

- III. Demonstrate an understanding of significant issues related to the intrapartal period.
  - A. Identify the risk status of mother and fetus based on a review of recent history, laboratory data, and a physical assessment, including labor evaluation and pelvic examination, if indicated.
  - B. Describe the stages and phases of labor.
  - C. Describe maternal physiologic and psychologic responses to labor.
  - D. Evaluate the fetal response to labor.

- E. Evaluate and promote maternal and fetal well-being, based on assessment of fetal monitor tracings, utilizing the NICHD terminology currently recommended by ACOG and AWHONN.
- F. Demonstrate unit-based competency in interpretation and intervention regarding electronic fetal monitor tracings.
- G. Outline appropriate emotional and physical support for the laboring woman and significant others.
- H. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia.
- I. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.
- J. Identify, stabilize, and manage the patient with intrapartal complications and recognize indications for referral. Examples of complications include:
  - 1. premature labor
  - 2. premature rupture of membranes
  - 3. cardiovascular abnormalities
  - 4. endocrine abnormalities
  - 5. neurologic abnormalities
  - 6. renal abnormalities
  - 7. hepatic abnormalities
  - 8. pulmonary abnormalities
  - 9. hematologic abnormalities
  - 10. infectious diseases
  - 11. acute obstetric emergencies
  - 12. placental abnormalities (e.g., accreta, increta, percreta, and previa)
  - 13. trauma
  - 14. obesity (based on BMI)
- K. Describe the nursing role in initiating and implementing a massive transfusion protocol, per institutional policy.
- L. Describe nursing management of the surgical obstetric patient, both intraoperatively and postoperatively.
- M. Describe nursing management of the critically ill obstetric patient who requires the use of high-tech equipment and procedures. Examples are:
  - 1. electrocardiogram interpretation
  - 2. arterial blood gas interpretation
  - 3. mechanical ventilation
  - 4. arterial line placement
  - 5. hemodynamic monitoring
- N. Explain the role of the nurse in assisting with the spontaneous or operative vaginal delivery.

- O. Describe appropriate procedure for initial assessment and resuscitation of the newborn as specified by the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP.
- P. Identify the legal implications of perinatal nursing, including appropriate documentation.
- Q. Identify indications and resources for intrapartal referral.

## **POSTPARTAL**

- IV. Demonstrate an understanding of significant issues related to the postpartal period.
  - A. Identify the risk status of the postpartal woman based on a review of recent history, including a labor and delivery summary, laboratory data, and a physical assessment.
  - B. Describe maternal physiologic and psychologic adaptation to the postpartal period.
  - C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.
  - D. Outline emotional and physical support necessary for the postpartal woman and her significant others.
  - E. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.
  - F. Identify measures to promote infant safety, including safe sleep, during and after the hospital stay.
  - G. Describe nursing care for the breast and/or bottle feeding mother, including strategies to promote success.
  - H. Describe the risks and benefits of various methods of contraception.
  - I. Develop, implement, and document postpartal education, including maternal and infant care and family adaptation.
  - J. Recognize the stages of grief and support the family during the process.
    - 1. Identify normal and pathologic responses to grief.
    - 2. Describe techniques of intervention with families experiencing grief.
    - 3. Institute appropriate referrals as necessary.
  - K. Identify, stabilize, and manage the patient with postpartal complications and recognize indications for referral.
  - L. Assess, stabilize, and manage the newborn after delivery.

## CONSULTATION/REFERRAL

- V. Demonstrate an understanding of significant issues related to consultation and/or referral during the perinatal period.
  - A. Identify common indications for consultation regarding care and/or transport of the high- risk mother or fetus utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - B. Describe the process of initiating consultation/referral with the Regional Perinatal Center.
  - C. Outline stabilization measures commonly used either prior to or during transport.

**NEONATAL OBJECTIVES FOR  
NURSES IN LEVEL IV FACILITIES**

## NEONATAL OBJECTIVES FOR NURSES IN LEVEL IV FACILITIES

These objectives may be met by practicing nurses in a number of ways. Some of the material presented here will have been learned during basic nursing education, while other objectives will be covered during new employee orientation or in continuing education settings.

All neonatal nurses should maintain current NRP and S.T.A.B.L.E. provider status.

In addition to the following, the nurse working in a Level IV facility should be able to provide care for neonates with complex congenital or acquired cardiac conditions requiring surgical intervention and/or conditions requiring extracorporeal membrane oxygenation (ECMO).

The nurse caring for neonatal patients in a Level IV facility should be able to:

- I. Identify factors from an obstetric history which might cause fetal compromise and evaluate the neonate for physiologic distress.
  - A. Describe the physiologic changes in the mother which occur during labor.
  - B. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.
  - C. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.
  - D. Given maternal histories, identify maternal problems which might result in a preterm birth.
  - E. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.
  - F. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.
  - G. Describe appropriate antepartal and intrapartal fetal surveillance tests and interpret results.
  - H. Given a hypothetical situation, identify neonatal sequelae related to:
    1. placental abnormalities
    2. maternal hypertensive disorders
    3. maternal metabolic abnormalities (i.e., diabetes)
    4. maternal age
    5. maternal chemical dependency (prescribed vs abused)
    6. maternal social-sexual history
    7. preexisting maternal medical conditions
    8. maternal medications and anesthetics
    9. multiple gestation
    10. maternal smoking

- II. Develop an appropriate neonatal plan of care based on an understanding of the maternal history.
- III. Discuss in detail fetal circulation and identify the physiologic changes that occur at birth.
  - A. Using a diagram, trace blood through the entire fetal circulation and identify the sites of venous admixture that are unique to the fetus.
  - B. Identify or describe the changes which occur at birth in the neonate's cardiovascular system and state the rationale for each change.
  - C. State the role of the placenta in gas exchange.
  - D. Describe maternal, fetal, and environmental factors which influence placental exchange.
  - E. Explain the interrelationships of blood flow, pressure and resistance.
  - F. List the effects of the following on resistance in all vascular beds:
    - 1. pH
    - 2. PO<sub>2</sub>/SaO<sub>2</sub>
    - 3. PCO<sub>2</sub>
    - 4. Prostaglandins
    - 5. Inhaled nitric oxide (iNO)
    - 6. Indomethacin / Ibuprofen
    - 7. Blood volume secondary to timing of cord clamping
- IV. Manage the newborn's transition to extrauterine life.
  - A. Manage early transition and resuscitation as specified in the most recent edition of the *Textbook of Neonatal Resuscitation* published by AHA and AAP.
  - B. Given patient situations, develop a plan of care that would allow early recognition and long-term management of sequelae from asphyxia and cardiopulmonary resuscitation, including consultation and referral when indicated.
    - 1. Cord clamping per unit policy
    - 2. Identify and / or provide neuroprotective hypothermia to appropriate babies
  - C. Develop a management plan for all neonates that would enhance transition from the fetal cardiopulmonary circuit to the neonatal cardiopulmonary circuit.
- V. Perform a comprehensive and systematic assessment of the neonate and take action based on findings.
  - A. Identify factors that influence the homeostatic range for the following during neonatal life:
    - 1. temperature

2. heart rate
  3. respiratory rate and pattern
  4. color
  5. oxygen saturation
  6. blood pressure
  7. hematocrit/hemoglobin
  8. blood glucose
- B. When given a neonate to assess, identify normal physical characteristics and common variations related to:
1. body contour, proportions, and posture
  2. head (including occipital frontal circumference, names of fontanelles and sutures)
  3. face (including mouth and nose)
  4. eyes
  5. ears
  6. skin
  7. chest
  8. abdomen
  9. genitalia and rectum
  10. extremities
  11. vertebral column
  12. reflexes
- C. When given a neonate to assess:
1. identify, describe, and locate point of maximal impulse of the heart
  2. count and record apical heart rate and respiratory rate
  3. identify heart murmurs
  4. auscultate the lungs and describe breath sounds
  5. identify flaring of the nostrils, retractions, grunting, inspiratory stridor, apnea, and choanal atresia, and relate the significance of these findings to problems experienced by the neonate
  6. identify the presence, strength, and equality of all pulses
  7. describe abdominal girth and shape, stooling pattern, and voiding pattern
  8. describe skin turgor, texture, color, and perfusion
  9. describe level of consciousness, activity / tone, and comfort / pain
  10. evaluate central and peripheral blood pressure
  11. measure and record blood glucose
  12. perform a complete physical assessment, record findings, identify patient needs, and initiate appropriate action based upon findings
- D. Describe appropriate ways of obtaining blood samples from a variety of sites which optimize accurate lab results and minimize complications for the newborn.
- E. Establish a plan for stabilization and appropriate management of all infants, including those who are critically ill utilizing the NRP and S.T.A.B.L.E. Program resources.

- F. Describe an education plan that includes infant assessment by the parent / caregiver at home.
- VI. Appropriately utilize the neonate's gestational age and fetal growth pattern in managing care.
- A. Define the following terms:
    1. early term, full term, and late term neonate
    2. preterm neonate
    3. late preterm neonate
    4. postterm neonate
    5. small for gestational age (symmetric and asymmetric)
    6. intrauterine growth restriction (IUGR) (symmetric and asymmetric)
    7. large for gestational age
    8. appropriate for gestational age
    9. low birth weight
    10. very low birth weight
    11. extremely low birth weight
  - B. Define the stages of fetal cellular growth and identify developmental problems associated with interference in each stage.
  - C. Identify infants at increased risk for growth and gestational age complications based upon maternal history.
  - D. Determine the gestational age of a neonate by utilizing a standardized scoring system.
  - E. Determine a neonate's growth classification by plotting the birth weight, head circumference, and length on an intrauterine growth chart and interpret significance.
  - F. State the implications of abnormal intrauterine growth and of non-term birth.
  - G. Given a variety of patient gestational ages and growth parameters, develop a plan of care which reflects consideration of these issues.
- VII. Apply knowledge of thermoregulation through assessment of the neonate's temperature status and maintenance of an optimal thermal environment.
- A. Define neutral thermal balance.
  - B. List the physiologic characteristics in the neonate which influence heat loss and describe how each characteristic influences heat loss.
  - C. List the modes of heat transfer in the neonate, give an example of each, and identify interventions to decrease heat transfer by each of the modes.
  - D. When given a patient situation (i.e., surgery, special procedures, etc.), identify measures to promote a neutral thermal environment.

- E. Describe the physiologic processes by which the neonate attempts to maintain body temperature.
  - F. List the physiologic problems which may result from hypo- and hyperthermia.
  - G. Identify optimal skin, axillary, and core temperatures for both premature and term neonates.
  - H. Compare and contrast methods for monitoring a neonate's temperature with regard to safety and accuracy.
  - I. Compare and contrast methods of providing external heat for the neonate, including:
    - 1. skin-to-skin care
    - 2. warm, draft free room (operating, delivery, transport, nursery, NICU)
    - 3. incubator
    - 4. radiant warmer
    - 5. servocontrol
    - 6. manual control
    - 7. heat packs and mattresses
    - 8. polyethylene wraps or bags
    - 9. appropriate use of humidity
  - J. Describe safe methods of increasing and decreasing a neonate's temperature.
  - K. Identify factors other than body temperature which may indicate the status of the neonate's thermal balance.
  - L. Utilize theoretical knowledge of thermoregulation to provide an optimal ambient temperature, relative humidity and wind velocity for the neonate.
  - M. Utilize all thermoregulation equipment safely.
  - N. Describe appropriate long-term thermal management of the neonate, including weaning from warmer to incubator or incubator to crib.
  - O. Utilize head/body cooling if indicated per institutional policy.
  - P. Describe an education plan that includes appropriate temperature assessment and management by the parents.
- VIII. Manage the neonate's fluid and nutritional needs to promote optimal growth.
- A. Calculate the fluid and caloric needs of the neonate based upon weight, age, physiologic problems, and rate of growth. Anticipate and provide appropriate interventions.
  - B. Calculate the appropriate protein, fat, carbohydrate, mineral, and vitamin content for neonates of various gestational ages and weights. Anticipate and provide appropriate interventions, (i.e., transepidermal water loss).

- C. Discuss the indications and contraindications for initiating or continuing feeding.
  - D. When total oral feeding is not an option, develop a plan of care to meet fluid, electrolyte, and nutritional needs, including the use of hyperalimentation and intralipid therapy.
  - E. Describe the advantages, disadvantages, and potential complications of varying the concentration of commercial formulas.
  - F. Describe the appropriate use and preparation of human milk, supplements, and commercial formula to meet fluid, nutrient, mineral, and vitamin requirements of neonates.
  - G. Encourage, promote and support early breast feeding or collection of breast milk for infants, including those who may be transferred.
  - H. Teach and assess basic breastfeeding techniques, including latch, milk transfer, hand expression, and safe milk storage.
  - I. Describe the appropriate use of human milk, supplements, and commercial formula to meet fluid, nutrient, mineral, and vitamin requirements of neonates.
  - J. Evaluate a neonate's postnatal growth using a postnatal growth chart and identify appropriate management responses.
  - K. Develop a plan to teach parents appropriate oral nutrient and fluid sources and indications that consultation is necessary to alter oral intake after discharge.
- IX. Select the most appropriate technique for feeding the high-risk infant.
- A. List advantages and disadvantages of continuous gastric, intermittent gastric, transpyloric, gastrostomy, and breast / bottle feeding based on knowledge of the newborn's physiologic status, gestational age, and weight.
  - B. Describe safe and effective procedures for feeding infants receiving continuous gastric, intermittent gastric, gastrostomy, breast and/or nipple feedings.
  - C. Recognize and report signs of feeding intolerance and differentiate care-related problems from actual changes in the newborn's clinical status.
  - D. Describe the correlation of blood glucose levels to the newborn's feeding regimen.
  - E. List measures to decrease oxygen consumption, trauma, infection, air ingestion, vomiting, and aspiration in relationship to feeding techniques.
  - F. Describe methods for assisting the caretaker of a newborn with feeding techniques.
- X. Correctly administer intravenous fluids.

- A. Calculate the fluid needs of the neonate, based upon weight, age, and physiologic status.
  - B. Describe care-related causes of the following:
    - 1. overhydration
    - 2. underhydration
    - 3. infection at intravascular sites
    - 4. clotting of intravascular lines
    - 5. hemorrhage
    - 6. hypoglycemia
    - 7. hyperglycemia
    - 8. infiltration
    - 9. embolism
    - 10. thrombosis
  - C. Describe nursing measures that will enhance the positive effects and minimize the side effects of the following:
    - 1. glucose and electrolyte solutions, including total parenteral nutrition (TPN), intralipid therapy, and colloids
    - 2. umbilical venous and arterial lines
    - 3. peripheral venous and arterial lines
    - 4. peripherally inserted central catheter (PICC lines)
    - 5. surgically placed lines
- XI. Anticipate and identify fluid and electrolyte imbalance in the sick neonate.
- A. Define fluid and electrolyte requirements for all neonates.
  - B. Describe the following mechanisms for control of fluid and electrolyte balance:
    - 1. diffusion
    - 2. osmosis
    - 3. filtration
    - 4. sodium and potassium pump
    - 5. ADH control
    - 6. rennin, angiotensin, aldosterone control
  - C. Recognize clinical histories, major signs, symptoms, laboratory values, and clinical interventions for the following:
    - 1. electrolyte abnormalities
    - 2. fluid shifts
    - 3. overhydration
    - 4. dehydration
  - D. Given a clinical history, laboratory values, and physical assessment data, delineate an appropriate assessment and treatment plan for the conditions listed above.

- XII. Apply knowledge of acid-base balance in the management of the sick newborn.
- A. Identify pathophysiologic changes which result from acidosis and alkalosis.
  - B. Define the terms: pH, acid, base, base excess, and buffer.
  - C. Describe how blood, respiratory, and renal buffers compensate for acid-base imbalance.
  - E. Identify acceptable neonatal parameters for blood gas values (pH, PO<sub>2</sub>, PCO<sub>2</sub>, HCO<sub>3</sub>, base excess, and pre / post oxygen saturation).
  - F. Compare and contrast the clinical significance of respiratory gas information obtained from various sites.
  - G. Identify abnormal blood gases that require a change in therapy from those that require continued assessment without a change in therapy.
  - H. Recognize blood gas reports that indicate the following with the assistance of the S.T.A.B.L.E. blood gas nomogram:
    - 1. compensated and uncompensated metabolic acidosis
    - 2. compensated and uncompensated metabolic alkalosis
    - 3. compensated and uncompensated respiratory acidosis
    - 4. compensated and uncompensated respiratory alkalosis
    - 5. mixed metabolic and respiratory imbalances
  - I. Describe the etiology of acid-base imbalances in relation to gain or loss of fixed acid, gain or loss of base, gain or loss of carbon dioxide.
  - J. Describe the relationship of the following to acid-base balance (pH) and measures to optimize each factor.
    - 1. PO<sub>2</sub>, PCO<sub>2</sub>, base excess
    - 2. diffusion gradient/O<sub>2</sub> and CO<sub>2</sub> sources
    - 3. respiratory rate/drive
    - 4. functional residual capacity (FRC)/air trapping/atelectasis
    - 5. tidal volume/diffusing surface/mean airway pressure/minute ventilation
    - 6. blood flow
    - 7. Hgb function
    - 8. nutrient supply / sources of acid and base
    - 9. infant and ambient temperature
    - 10. urinary and GI losses
  - K. Describe appropriate use of pharmacologic agents which alter acid-base balance.
- XIII. Apply knowledge of respiratory physiology in the management of newborns with respiratory disorders.

- A. Demonstrate a working knowledge of the terms used to describe respiratory pathology, pulmonary function, and respiratory support.
  - B. List physiologic events which must occur at birth in order for the lungs to function postnatally and list factors responsible for each event.
  - C. Describe physiologic factors which enhance or deter respiratory function.
  - D. Describe physiologic factors which oppose air entry into the alveoli.
  - E. Describe how surfactant influences establishment of functional residual capacity (FRC), including factors which may limit or enhance surfactant production.
  - F. Describe factors which influence the following:
    - 1. closure of fetal shunts
    - 2. pulmonary arteriolar dilation
    - 3. pulmonary vascular resistance
    - 4. cerebral blood flow
  - G. Describe medical and nursing measures which may enhance the establishment of respiration.
  - H. Describe physiologic factors in the newborn which may limit the establishment of normal respiration.
  - I. Describe the pathophysiologic changes in and etiology of neonatal respiratory disorders.
  - J. Describe gestational age, clinical presentation, pathophysiology, radiologic findings, and laboratory findings which would assist in differentiating specific neonatal respiratory disorders.
  - K. Given specified neonatal respiratory patterns, identify the probable etiology, based on knowledge of gestational age, pathophysiology, and the environment.
  - L. Describe the mechanism of action, side effects, and appropriate administration of pharmacologic agents (i.e., surfactants) used in the treatment of neonatal respiratory disorders.
  - M. Describe nursing management of neonates with respiratory disorders requiring surgical intervention.
- XIV. Describe appropriate measures for managing neonatal respiratory support systems.
- A. Describe the indications for and the mechanisms of operation of various respiratory support systems.
  - B. Demonstrate a thorough working knowledge of the neonatal respiratory support equipment used in the facility.

1. describe clinical indications and measures to diminish, identify, and treat the potential complications.
  2. describe the types of ventilators used in the unit, including the terms used with respect to each.
  3. discuss indications for and safe use of inhaled nitric oxide.
- C. Describe the possible complications which may be associated with respiratory support and develop a management plan to limit these complications.
  - D. Describe the etiology, specific signs and symptoms, and radiologic findings associated with neonatal respiratory disorders.
  - E. Describe safe methods of adjusting respiratory support based on the clinical condition of neonate, blood gases, oxygen saturation, and radiologic findings.
  - F. Describe the pharmacologic methods used in the treatment of respiratory disorders.
- XV. Plan, provide, and evaluate the care of infants with cardiac disorders.
- A. Explain the embryogenesis of cardiac development.
  - B. Describe the cardiovascular pressure, resistance, and blood flow alterations resulting from cardiac disorders.
  - C. Describe common cyanotic and acyanotic heart defects in the newborn period.
  - D. Describe the physiologic problems associated with patent ductus arteriosus.
  - E. Identify the data base which is necessary to differentiate heart disease from respiratory disease.
  - F. Describe the indications for, the mechanism of action, and the side effects of common medications used in the treatment of cardiopulmonary disease. (i.e., prostaglandins).
  - G. Recognize major rate and rhythm abnormalities.
  - H. Explain the rationale for critical congenital heart disease (CCHD) screening and perform appropriately.
- XVI. Describe the nursing care required by newborns undergoing any surgical procedure, including ECMO.
- XVII. Plan, provide, and evaluate the nursing care of newborns with hematologic disorders.
- A. Briefly describe hematopoiesis in the fetus / newborn.
  - B. Describe the characteristics which differentiate adult and fetal hemoglobin.

- C. Describe normal neonatal coagulation.
  - D. Identify normal neonatal hematologic values.
  - E. Describe how the following factors may alter laboratory data:
    1. gestational age
    2. timing of cord clamping
    3. delivery technique
    4. blood volume
    5. transfusion
    6. exchange transfusion / partial volume exchange transfusion
    7. timing of sample
    8. sampling technique
  - F. Identify etiology, infants at risk, and management plan for:
    1. hemorrhage
    2. hemolytic disorders
    3. coagulation disorders
    4. thrombocytopenia
    5. polycythemia / hyperviscosity syndrome
    6. acute and chronic anemia
  - G. Describe the formation, transport, conjugation, and excretion of bilirubin.
  - H. Describe the pathophysiologic changes that may be responsible for intravascular hemolysis, extravascular hemolysis, and impaired hepatic function as related to hyperbilirubinemia.
  - I. Describe those factors that increase the risk of neurotoxicity due to hyperbilirubinemia.
  - J. Describe a nursing assessment plan that allows prompt recognition of abnormal bilirubin metabolism and a management plan that reduces the risk of neurotoxicity.
  - K. Describe a parent teaching plan that encourages prompt recognition and referral for jaundice in the community setting.
  - L. Recognize the components of and the rationale for newborn hemoglobinopathy screening in the state of Tennessee and perform appropriately.
- XVIII. Plan, provide, and evaluate the nursing care of newborns with selected metabolic disorders.
- A. Describe the pattern of glucose metabolism in the newborn period.
  - B. Describe how the following factors may alter serum glucose values:
    1. gestational age

2. placental glucose transport
  3. hormones
  4. glycogen storage and release
  5. glucose intake and metabolism
  6. protein and fat intake
  7. enteral and parenteral nutrition
  8. aerobic vs anaerobic metabolism
  9. thermal status
  10. medications that alter glucose metabolism
- C. Identify infants at risk for abnormalities in glucose metabolism and describe glucose screening plans appropriate to the risk factors.
  - D. Describe management plans that maintain a safe serum glucose level and an appropriate growth pattern.
  - E. Identify infants at risk for abnormalities in calcium and magnesium metabolism.
  - F. Identify abnormal serum calcium and magnesium levels from lab reports and differentiate those that require immediate intervention from those which should be further monitored.
  - G. Describe a safe and effective treatment plan for infants who exhibit abnormal calcium, magnesium and glucose metabolism.
  - H. Demonstrate awareness of rare inborn errors of metabolism.
  - I. List the components of and the rationale for newborn metabolic screening in the state of Tennessee and perform appropriately. Discuss situations where metabolic screening before 24 hours of age is required (such as babies requiring transfer to a higher level of care or a blood transfusion).
- XIX. Plan, provide, and evaluate the nursing care of newborns with gastrointestinal disorders.
- A. Characterize the functional limitations of gestational age on the gastrointestinal tract.
  - B. List clinical signs of gastrointestinal dysfunction.
  - C. Identify circumstances which will alter digestion, absorption, and motility.
  - D. When given a patient situation, differentiate between signs of upper and lower gastrointestinal obstructions.
  - E. When given a clinical situation, identify therapeutic measures that will alleviate or diminish gastrointestinal problems.
  - F. Describe signs of pathology which would indicate the need for:
    1. no feedings (NPO)
    2. stopping /discontinuing feedings

3. gastric aspiration
  4. intermittent gastric/GI suction
  5. hematest on stools
  6. reducing substances test on stools
  7. enema or suppository
  8. changing of infant's position
  9. sterile protective covering of exposed organs
  10. abdominal girth measurement
- G. Discuss the pathogenesis, medical and surgical management, and nursing care of neonatal gastrointestinal disorders.
- H. Describe a teaching plan that would assist parents in notifying the physician appropriately of gastrointestinal dysfunction after discharge.
- XX. Identify common sources of perinatal infections, clinical indications of infections, and methods to prevent health care associated infections.
- A. Identify pathways of congenital and health care associated infections.
  - B. Utilize maternal history, birth history, clinical presentation, and serial laboratory results as a basis for planning neonatal infectious disease screening and management.
  - C. Describe signs of localized and systemic congenital and health care associated infections in the neonate.
  - D. Describe how the neonate's immune system response predisposes to infection and affects laboratory values.
  - E. Differentiate those laboratory values and signs related to screening for infection that require immediate intervention from those that require further monitoring.
  - F. Describe a safe and effective management plan for the neonate at risk for or experiencing infection.
  - G. Describe a management plan that limits the spread of infection as described in unit policy.
  - H. Describe a management plan that appropriately informs parents about immunizations, documents parental consent for immunizations, and provides immunizations at the appropriate time.
- XXI. Plan and implement measures to protect sensory neural function and to evaluate the infant's response to care.
- A. Describe the central nervous system control of neurologic function according to gestational and postnatal age.
  - B. Identify disorders which alter function of the nervous system.

- C. Describe and implement a comprehensive assessment plan which will provide for prevention, early identification and prompt treatment of sensory neural disorders.
    - 1. reflexes
    - 2. posture
    - 3. activity and movement
    - 4. level of consciousness
    - 5. rest and sleep pattern
    - 6. comfort, irritability, pain
    - 7. vision
    - 8. hearing
    - 9. appropriate positioning using developmental aids
  - D. Identify and describe seizure activity and delineate a plan for safe administration of prescribed anticonvulsants.
  - E. Identify the pathogenesis, recognition, prognosis, and patient management of:
    - 1. microcephaly
    - 2. major chromosomal abnormalities (Trisomy 13-15, 18, 21)
    - 3. congenital and acquired hydrocephaly
    - 4. infection of the central nervous system (prenatal and postnatal)
    - 5. neural tube defects
    - 6. intracranial/ intraventricular hemorrhage and periventricular leukomalacia
    - 7. neurologic sequelae of drugs, hypoxia, acid-base imbalance, electrolyte imbalance, metabolic disorders, and thermoregulation disorders
    - 8. cerebral edema
    - 9. hypoxic-ischemic encephalopathy (HIE)
  - F. Describe an education plan that includes parent recognition of appropriate sensory neural function for age, necessity for continuing medical and developmental assessment, and interventions appropriately used by parents.
- XXII. Assess and manage the infant with suspected neonatal abstinence syndrome (NAS).
- A. Identify the infant at risk for NAS.
  - B. Describe signs and symptoms of NAS.
  - C. Demonstrate use of appropriate NAS scoring system.
  - D. Describe non-pharmacologic and pharmacologic management of NAS.
  - E. Describe hospital policy regarding the mandatory reporting of NAS cases to the Tennessee Department of Health.
- XXIII. Utilize knowledge of neonatal pharmacology to optimize desired drug actions and minimize side effects.
- XXIV. Describe a management and education plan that promotes infant safety in the hospital and the community. One place where information can be located is the AAP "parenting

corner” section on their Healthy Children website. The website can be accessed at [www.HealthyChildren.org](http://www.HealthyChildren.org). Topics addressed in the “parenting corner” include, among others, the following:

- A. Discharge plans and follow-up care as determined by health care provider
  - B. Bathing and skin care
  - C. Cord care
  - D. Care of circumcised and uncircumcised infants
  - E. Conscientious hand washing / hand sanitizing and appropriate hygiene
  - F. Immunizations per current recommendations from the American Academy of Pediatrics. RSV prevention should be taught to all parents. RSV prophylaxis should be provided as clinically indicated.
  - G. Falls
  - H. Burns (sunburn)
  - I. Safe sleep
  - J. Emergency preparedness / disaster planning (examples are infant security, Code Pink, evacuation, etc.)
  - K. Infant restraint device / institutional policy regarding car seat tolerance testing
  - L. According to state statute (TCA), at least one infant parent or caregiver must receive information regarding infant CPR before discharge from the hospital. Tennessee Hospital Association member hospitals have been granted permission to refer caregivers to the website [www.learn CPR.org](http://www.learn CPR.org).
  - M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect
  - N. Reasons for avoiding second hand smoke around infants and children
  - O. Reasons to contact the baby’s primary care provider (respiratory distress, no stool in 24 hours, decreased urine output, refusal to feed, change in activity, abnormal temperature, etc.)
- XXV. Utilize culturally-appropriate parent-infant attachment concepts in dealing with families of sick newborns.
- A. Identify prenatal and postnatal factors which may influence parental attachment and caretaking.
  - B. Recognize and describe behaviors which indicate the status of parent-infant attachment, including the significance of these behaviors.

- C. Recognize and describe the stages of emotional stress and the grief process. This includes both families dealing with an infant loss and those dealing with an infant receiving palliative care.
  - D. Describe how emotional stress and the grief process may influence family relationships.
  - E. Plan and implement nursing measures which will appropriately facilitate and support completion of the grief process.
  - F. Describe how attitudes of “significant others” influence parental attachment.
  - G. Plan and implement nursing measures which will facilitate culturally-appropriate parent-infant interaction.
  - H. Identify and utilize community resources for various aspects of home care support after discharge.
- XXVI. Demonstrate an understanding of significant issues related to consultation and/or referral during the neonatal period.
- A. Describe the interactive roles of health care disciplines in providing care to neonates and their families.
  - B. Identify common indications for consultation regarding care and/or transport of the high- risk neonate utilizing the current edition of the *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* published by the Tennessee Perinatal Care System, Tennessee Department of Health, Division of Family Health and Wellness.
  - C. Describe the process for initiating consultation/referral with the appropriate referral center.
  - D. Outline stabilization measures commonly used either prior to or during transport utilizing the S.T.A.B.L.E. Program guidelines.

## **EDUCATIONAL OBJECTIVES FOR NEONATAL TRANSPORT NURSES**

## EDUCATIONAL OBJECTIVES FOR NEONATAL TRANSPORT NURSES

The following educational objectives for transport nurses are in addition to the educational objectives for nurses working in a level I, II, III and IV facility.

The nurse caring for neonatal patients during transport should have experience in the care of critically ill neonatal patients in the inpatient setting, acute care setting or both, and should be able to meet the objectives listed for each of the following categories:

- I. Problems of Pregnancy, Fetal Development, Labor and Delivery
  - A. Obtain from a referring health care provider, reports of all tests done to determine fetal gestational age and well-being.
  - B. Utilize data from the maternal/neonatal history as a basis for anticipating problems, planning, and implementing care during transport.
  - C. Provide for a receiving health care provider, maternal and neonatal data which give adequate history of problems resulting from pregnancy, labor, and delivery, as well as treatment provided.
- II. Resuscitation of the Newborn
  - A. Provide for a receiving health care provider an accurate record of necessary resuscitative procedures and the neonate's physiological responses.
  - B. Perform appropriate resuscitation if needed during transport as outlined in the most recent edition of NRP.
- III. Physical Assessment of the Newborn
  - A. Collaborate with other transport team members in performing a thorough physical assessment prior to transport.
  - B. In consult with medical control physician (MCP), describe and initiate an assessment, monitoring, and intervention plan during transport that will address infant problems in a timely manner.
  - C. Provide for a receiving care provider a complete record of physical assessment, which includes information from the referring care providers as well as the transport staff.
- IV. Thermoregulation
  - A. Explain the effect of environmental factors; e.g., humidity, ambient temperature, altitude, and velocity of air flow on the thermal status of the neonate.
  - B. Describe safe methods of obtaining, maintaining, increasing, and/or decreasing a neonate's temperature in a transport situation.

- C. Provide a receiving care provider with a thorough history of the infant's thermoregulation problems, treatment of these problems, and infant responses to intervention prior to and during transport.
  - D. Provide appropriate body cooling measures when indicated.
- V. Nutritional Requirements of the Newborn
- A. Describe the effects of speed, acceleration, and deceleration on gastrointestinal motility and sphincter control.
  - B. Describe safe means of providing infant nutrition (IV or enteral) in a variety of transport situations.
  - C. Obtain from a referring care provider an accurate nutritional record for the receiving care provider.
  - D. Provide lactation support, including safe transport and proper storage of human milk to the receiving center.
- VI. Intravascular Therapy
- A. Describe and utilize safe, efficient measures to initiate and maintain appropriate intravascular therapy during transport.
  - B. Prepare and administer fluid and blood products that may be required during transport.
  - C. Record for a receiving care provider an accurate summary of fluid and blood products infused prior to and during transport.
- VII. Medication Administration
- A. Describe indications and utilize knowledge of neonatal pharmacology to appropriately prepare, administer, and then monitor the medication effects on the neonate.
  - B. Provide for a receiving care provider an accurate record (drug name, dose, time, and route) of medications used prior to and during transport and the neonate's responses to these medications.
- VIII. Fluid, Electrolyte, and Acid-Base Balance
- A. Describe the effects of marked changes in humidity, velocity, and pressure on insensible fluid loss and measures to limit these effects.
  - B. Obtain and record an accurate summary of fluid, electrolyte, and acid-base status prior to and during transport.
- IX. Respiratory Disorders of the Newborn

- A. Describe the effects of altering atmospheric pressure, altitude, temperature, and humidity on neonatal respiratory function and discuss nursing measures to minimize these effects.
  - B. Select and utilize respiratory measures, pharmacologic agents, intravenous orders, and infant positioning to assist in lessening or preventing the possible environmental factors listed above.
  - C. Obtain an accurate history of respiratory status and respiratory support provided prior to transport and develop, in consultation with the medical control physician (MCP), an ongoing record of assessment, evaluation, and respiratory support for the receiving center.
- X. Respiratory Support System
- A. Set up and correctly utilize respiratory support and monitoring equipment used during transport.
  - B. Describe the settings to be used to appropriately ventilate the patient when transferring from one mode or device to another including manual ventilation.
  - C. List indications for initiation or continuance of inhaled nitric oxide (INO) during transport.
  - D. Utilize a portable blood gas instrument to assist in providing appropriate oxygen and ventilation support during transport when indicated.
- XI. Hematologic Disorders of the Newborn
- A. Collaborate with referring care providers and transport team members to obtain reports and/or specimens for a hematologic database. Include information on the treatment of these disorders prior to and during transport.
  - B. Collaborate with the receiving center or referral center in obtaining blood or blood products, which may be required during transport to the receiving center.
  - C. Provide for a receiving care provider an accurate hematologic history, including treatment prior to and during transport.
- XII. Gastrointestinal Problems of the Newborn
- A. Identify the special techniques and measures required to provide the necessary care and limit the side effects of gastrointestinal obstructions and/or abdominal wall defects during transport.
  - B. Provide for a receiving care provider a history of gastrointestinal function, treatment, and neonatal response prior to and during transport.
- XIII. Perinatal Infection

- A. Collaborate with team members in collecting the different components of a septic work-up in a safe and timely manner.
- B. Develop and implement procedures, which will enhance prevention and management of infection in transport situations.
- C. Obtain and communicate a history which identifies a neonate's risk of infection.

#### XIV. Cardiac Disorders of the Newborn

- A. Design and implement a plan of care, in consultation with the medical control physician (MCP), that will provide maximum protection from hypoxic and/or circulatory damage for the infant who has cardiac disorders.
- B. Provide for a receiving care provider a thorough report of cardiovascular problems, treatment, and neonatal condition prior to and during transport.

#### XV. Parent-Infant Relationships

- A. Describe and utilize measures which will enhance a positive relationship between parents and health care personnel in the referring and receiving centers.
- B. Describe the potential effects of transport on the development of a positive parent-infant relationship.
- C. Describe and utilize measures that will minimize the negative effects of transport on parent-infant bonding.
- D. Provide for the receiving care provider a report of significant parent, neonate, and staff interactions as well as appropriate cultural and social histories.
- E. Encourage pumping of breast milk within 4 to 6 hours of delivery. Work with referral staff to assist the mother with proper pumping and breast milk storage.

#### XVI. Referring-Receiving Care Provider Relationships

- A. When given a report by the referring care provider, anticipate and request information necessary to provide continuous expert care.
- B. Collaborate with other nurses in the perinatal region in developing transport plans, which provide comprehensive, continuous, and expert care.
- C. Describe the general types of services available in Level I, II, III, and IV newborn facilities.
- D. Identify and communicate effectively the attributes and limitations of Level I, II, III, and IV newborn facilities in the region.
- E. Describe, utilize, and communicate to other health care providers appropriate procedures for initiating consultation, referral, and transport.

- F. Describe and acquire all applicable hospital records required prior to transport.
- G. Describe facility policy for obtaining transport consent.
- H. Identify and evaluate communication methods utilized in the transport region.
- I. Seek and accept constructive evaluation of the referral process from nurses in referring and receiving facilities.
- J. Utilize quality improvement methods for evaluation and improvement of care in the referring hospital, transport service, and receiving hospital.

XVII. Transport Safety (as required by state licensure)

- A. Describe those factors, which must be considered in the selection of a vehicle and professional personnel for transport.
- B. Describe and utilize required effective techniques for securing transport equipment and compressed medical gas tanks in transport vehicles.
- C. Describe and utilize effective techniques for entering and exiting the transport vehicle to provide maximum safety for medical personnel and for newborn patient(s).
- D. Determine adequacy of illumination in transport vehicles.
- E. Provide continuous visibility of the infant, support equipment, and monitors during transport.
- F. Determine that space available in the transport vehicle is adequate for safe emergency intervention during transport.
- G. Describe briefly the effects of vibration and sound level on the infant in transit and develop a plan to diminish these effects.
- H. Determine the adequacy of power sources to assure uninterrupted power availability during transport.
- I. State the potential hazards of vehicle acceleration, deceleration, and speed on the transported infant and take appropriate measures to limit their occurrence, including an appropriate restraint system.
- J. Determine and provide an adequate supply of oxygen and air required for transport.
- K. Describe and utilize effective methods for testing equipment function prior to transport.
- L. Identify and provide the life support and monitoring equipment and supplies necessary for transport.

- M. Implement a plan which provides for replacement, cleaning, and maintenance of transport vehicle, equipment, and supplies.
- N. Communicate an infant assessment which will assure adequate professional support and equipment upon the arrival of the transported infant at the receiving center.
- O. Describe to others and utilize appropriate steps for stabilizing the infant prior to transport.
- P. Utilize appropriate communication methods to effectively obtain consultation from the medical control physician (MCP).
- Q. Maintain records which can be readily utilized to evaluate the effectiveness of the transport system.
- R. Assist in evaluation and implement measures to improve the transport process.