TENNESSEE PERINATAL CARE SYSTEM

EDUCATIONAL OBJECTIVES FOR NURSES
LEVELS I, II, III, IV
AND
NEONATAL TRANSPORT NURSES

Seventh Edition

Effective November 1, 2022

Tennessee Department of Health
Family Health and Wellness

Appendix A – Newborn Screening: Special Care Nursery/NICU Recommendations

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(SEVENTH 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
https://www.tn.gov/health/health-program-areas/mch.html
(Click on Perinatal Regionalization Program, scroll down to Publications)

PERINATAL REGIONALIZATION IN TENNESSEE

Background/History

Efforts to implement a regionalized approach to perinatal care in Tennessee date back to the 1970's, at which time many national studies, including the landmark National March of Dimes document entitled "Toward Improving the Outcome of Pregnancy", revealed that a coordinated system of health care, outreach, and professional education could improve perinatal outcomes and lower infant mortality.

In 1974, a "Neonatal Law" was passed (T.C.A. § 68-1-801-804) to establish the High-Risk Newborn Program at the four existing NICUs in Memphis, Nashville, Chattanooga and Knoxville. In 1977, the law appropriated state funds as well as expanded the program to include high-risk obstetrics and thereby created the Tennessee Perinatal Care System, establishing a Perinatal Center within each of the four (4) designated regions. A fifth Center was established in Johnson City in 1986.

Perinatal Regions

Each perinatal region is comprised of a group of contiguous counties. The perinatal regions and counties are listed on page 6 of this document. Each region contains one Perinatal Center, which has been so designated by the Commissioner of the Tennessee Department of Health and is capable of providing Level III or Level IV obstetric and neonatal care. The Regional Perinatal Centers are:

West Tennessee Regional Perinatal Center
Regional Medical Center at Regional One Health
Memphis, Tennessee

Middle Tennessee Regional Perinatal Center
Vanderbilt University Medical Center/Monroe Carrell, Jr. Children's Hospital at Vanderbilt
Nashville, Tennessee

Southeast Tennessee Regional Perinatal Center
Erlanger Health System/T.C. Thompson Children's Hospital at Erlanger
Chattanooga, Tennessee

East Tennessee Regional Perinatal Center
The University of Tennessee Medical Center at Knoxville
Knoxville, Tennessee

Northeast Tennessee Regional Perinatal Center
Johnson City Medical Center/Niswonger Children's Hospital
Johnson City, Tennessee

Purpose and Responsibilities of Tennessee's Regionalization System

The Perinatal Care System is a statewide infrastructure for the diagnosis and treatment of high-risk pregnant women, fetuses and neonates if no other appropriate facility is available to manage their significant condition(s), regardless of financial status. All activities are in compliance with

medical and operation standards and the guidelines as set out in the Tennessee Perinatal Center Care Systems *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities*, latest edition; Tennessee Perinatal Care System *Guidelines for Transportation*, latest edition; Tennessee Perinatal Care System *Educational Objectives for Nurses Levels I, II, III, IV, Neonatal Transport Nurses,* latest edition; Tennessee Perinatal Care System *Educational Objectives in Medicine for Perinatal Social Workers*, latest edition; and Tennessee Perinatal Care System *Guidelines on Equipment, Supplies and Training for Emergency Medical Services and Emergency Department Staff*, latest edition.

While the five (5) Regional Perinatal Centers operate within a designated hospital or university, the program is a standalone entity which provides:

- 24-hour consultation and referral for facilities and for health care providers within the respective perinatal region
- Professional education for providers (nurses, midwives, nurse practitioners, physicians, respiratory therapists, social workers, paramedics, etc.) within the region
- Maternal and neonatal transport
- Site visits, upon request, to provide consultation regarding physical facilities, staffing, and policies and procedures at hospitals within the region
- Post-discharge maternal follow-up and post-discharge neonatal follow-up
- Measuring and monitoring maternal and newborn outcomes for the region
- Maintaining ongoing relationships with regional providers, prenatal facilities and hospitals

Indirectly, the system impacts all mothers and babies in Tennessee by assuring that health care providers are educated on high risk perinatal care and have a system of consultation available to them. In FY 2022 (July 1, 2021 – June 30, 2022), Tennessee's Regional Perinatal Centers provided direct care for 4,807 high-risk neonates and 19,176 high-risk maternal patients.

All obstetric and neonatal-related activities within the Regional Perinatal Center should occur under the direction of a board-certified maternal fetal medicine specialist and a board-certified neonatologist, respectively. There should also, at a minimum, be one (1) obstetric and one (1) neonatal outreach educator/coordinator on-staff. It is also advisable to have an individual on staff to monitor expenditures and track contract services and deliverables. Staff of the Centers do not provide direct care; and therefore, should not be considered a part of a specific department within the direct services arm of the hospital/facility. The Regional Perinatal Center Co-directors are responsible for the staff hired to carry out the scope of services of the contract and for following all of the guidelines established for the Tennessee Perinatal Care System.

Perinatal Advisory Committee

The Perinatal Advisory Committee was established by statute (T.C.A. §68-1-803-804) and exists as a consultative body to advise the Department of Health in administration and implementation of the regionalization system across Tennessee. The Committee is comprised of twenty-one (21) members as designated in statute, including the obstetric and neonatal directors of the five Regional Perinatal Centers, private sector providers, hospital administrators, medical school representation, nurses working in perinatal medicine, and consumer and public health representatives. The committee is required to meet at least once annually. Committee members as well as invited experts are also instrumental in ensuring that the program's detailed Guidelines and other perinatal documents/guidelines/educational objectives remain current and are updated

every five years, a practice that has occurred since the first set of Guidelines was published in 1978.

Funding

The Division of TennCare oversees all contractual arrangements for this program, and the Tennessee Department of Health, Division of Family Health and Wellness, is responsible for the provision of technical assistance, the coordination of programmatic activities, and convening the Perinatal Advisory Committee. Each designated hospital/university accepts funds on behalf of the Regional Perinatal Center. The Centers are supported by funds from TennCare, Tennessee's Medicaid Plan with the Centers for Medicare & Medicaid Services, and state appropriations. Specific state appropriations were made available in 2016 to expand outreach education, and each Center was provided additional funds strictly for this purpose as outlined by the contract.

Resources

The Perinatal Regionalization Program has a variety of resources available, including copies of the latest editions of the Guidelines, a Perinatal Regionalization Fact Sheet, and a highlight video which may be accessed by visiting the website: https://www.tn.gov/health/health-program-areas/mch/mch-prp.html/.

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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 (7th) 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, there is also a section 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. The Tennessee Initiative for Perinatal Quality Care (TIPQC) is an additional resource available to practicing nurses in Tennessee for education and assistance in developing and maintaining skills necessary for ensuring quality care. Online education is also available through other sources (i.e., National Certification Corporation, Mead Johnson Nutrition, 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 (7th) 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. We recognize that families present with varying diversity. In keeping with plain language principles of health communication this document uses the terms “woman/women” or “mother” throughout. It should be taken to include people who do not identify as women but are pregnant or have given birth.

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 with a fetus 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 situations. 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 (discuss the importance of birth spacing/family planning, chronic disease management, and taking multivitamins/folic acid).

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. Discuss how health disparities and implicit bias impact health equity in regard to maternal morbidity and mortality rates.
- E. Describe the stages of fetal growth and development.
- F. Discuss the importance of good nutrition in pregnancy, including taking multivitamins/folic acid.

G. Explain the benefits of breastfeeding for mother and baby.

H. Explain the maternal and fetal effects of substance use/misuse during pregnancy, including reasons for obtaining urine drug screens (UDS) and knowing referral/treatment options.

I. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history, physical assessment, and need for chronic disease management.

J. Identify indications for and the significance of common maternal-fetal assessment techniques. Examples are:

1. non-stress testing
2. biophysical profile

K. Demonstrate facility-based competency in interpretation and intervention regarding electronic fetal monitor tracings.

L. Identify the essential components which should be included in prenatal and childbirth education. For post-delivery planning, discuss the importance of contraception for birth spacing.

M. Explain the importance of adequate screening for intimate partner violence in the pregnant woman and identify resources available for those affected by IPV.

N. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.

O. Identify indications and resources for prenatal referral.

INTRAPARTUM

III. Demonstrate an understanding of significant issues related to the intrapartum 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 intrapartum complications and consult / refer according to facility guidelines. Examples of complications include:

1. preterm labor
2. preterm prelabor 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.

K. 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.

L. Identify the legal implications of perinatal nursing, including appropriate communication and documentation.

M. Identify indications and resources for intrapartum referral.

POSTPARTUM

IV. Demonstrate an understanding of significant issues related to the postpartum period.

A. Identify the risk status of the postpartum 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 postpartum period.

C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.

D. Outline the emotional and physical support necessary for the postpartum woman and her significant others.

E. Identify risk of postpartum depression using the Edinburgh Postpartum Depression Scale (EPDS) and appropriate referral process.

F. Describe measures to promote infant safety, including safe sleep, during and after the hospital stay.

G. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

H. Describe nursing care for the breastmilk and/or formula feeding mother, including strategies to promote success.

I. Describe the risks and benefits of various methods of contraception, and verify that the patient has a contraceptive plan before discharge.

J. Develop, implement, and document postpartum education, including maternal and infant care and family adaptation.

K. Document discharge education for the postpartum patient including abnormal signs and the importance of notifying the provider.

L. 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.

M. Identify, stabilize, and manage the patient with postpartum complications and recognize indications for referral.

N. Assess, stabilize, and manage the newborn after delivery.

O. Describe the importance of the patient following up with recommended providers at the recommended times.

P. Discuss the importance of planning for future pregnancies through birth spacing/family planning, good nutrition (multivitamins/folic acid), and chronic disease management.

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 preconception and intrapartum periods that place the fetus and/or neonate at risk.

II. Describe the significance of normal and abnormal results from tests performed for 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 physiologic benefits of optimal cord clamping after birth, based on facility policy.

B. Assign an Apgar score at 1 and 5 minutes after birth for all infants, and at 5-minute intervals thereafter until 20 minutes of age for infants with a score less 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. servocontrol
6. manual control (use only to preheat the bed)
7. chemical 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 breastfeeding 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, proper patient labeling, 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

D. Discuss the process for obtaining pre- and post-ductal oxygen saturations and the significance of the findings.

E. Describe indications for oxygen therapy, methods for delivering oxygen to the neonate, and appropriate use of pulse oximeters.

F. Briefly describe signs of pneumothorax and immediate stabilization of this complication.

G. Briefly describe the pathogenesis and management of pulmonary and non-pulmonary respiratory distress.

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:

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 facility and/or health care provider's instructions.

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 breastfeeding and human milk jaundice.

H. Briefly describe 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) / neonatal opioid withdrawal syndrome (NOWS).

A. Identify the infant at risk for NAS/NOWS and describe the nurse's role in the screening tests per facility policy.

B. Describe signs of NAS/NOWS.

C. Describe facility policy regarding the mandatory reporting of NAS/NOWS 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. 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.

K. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect

L. Reasons for avoiding secondhand 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)[1].

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 information included in the most recent edition of The S.T.A.B.L.E. Program.

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.

SIMULATION TRAINING

I. Develop and implement simulation training for all nursing staff. Utilize resources at the Regional Perinatal Centers to assist with these efforts.

[1] Refer to APPENDIX A, for recommendations on newborn screening procedures for infants in a special care nursery/NICU setting. Additional information may also be accessed on the Newborn Genetics Screening Program website: https://www.tn.gov/health/health-program-areas/newborn-screening/newborn-screening/newborn-genetic-screening.html.

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 perinatal 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, including medical, sociodemographic, and genetic factors (discuss the importance of birth spacing/family planning, chronic disease management, and taking multivitamins/folic acid).

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. Discuss how health disparities and implicit bias impact health equity in regard to maternal morbidity and mortality rates.

E. Describe the stages of fetal growth and development.

F. Discuss the importance of good nutrition in pregnancy, including taking multivitamins/folic acid.

G. Explain the benefits of breastfeeding for mother and baby.

H. Explain the maternal and fetal effects of substance use/misuse during pregnancy including reasons for urine drug screen (UDS) and knowing referral/treatment options.

I. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history, physical assessment, and need for chronic disease management.

J. Identify indications for and the significance of common maternal-fetal assessment techniques. Examples are:

1. non-stress testing
2. biophysical profile

K. Identify the essential components which should be included in prenatal and childbirth education. For post-delivery planning, discuss the importance of contraception for birth spacing.

L. Explain the importance of adequate screening for intimate partner violence (IPV) in the pregnant woman and identify resources available for those affected by IPV.

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.

INTRAPARTUM

III. Demonstrate an understanding of significant issues related to the intrapartum 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 intrapartum complications and recognize indications for referral. Examples of complications include:

1. preterm labor
2. preterm prelabor rupture of membranes
3. hypertensive disorders
4. diabetes mellitus
5. infectious diseases
6. acute obstetric emergencies (e.g., preeclampsia with severe features, abruption)
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 communication and documentation.

O. Identify indications and resources for intrapartum referral.

POSTPARTUM

IV. Demonstrate an understanding of significant issues related to the postpartum period.

A. Identify the risk status of the postpartum 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 postpartum period.

C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.

D. Outline the emotional and physical support necessary for the postpartum woman and her significant others.

E. Identify risk of postpartum depression using the Edinburgh Postpartum Depression Scale (EPDS) and appropriate referral process.

F. Describe measures to promote infant safety, including safe sleep, during and after the hospital stay.

G. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

H. Describe nursing care for the breastmilk and/or formula feeding mother, including strategies to promote success in both the hospital and the community.

I. Describe the risks and benefits of various methods of contraception,including immediate postpartum long-acting reversible contraception (LARC).

J. Develop, implement, and document postpartum education, including maternal and infant care and family adaptation.

K. Document discharge education for the postpartum patient including abnormal signs and importance of notifying provider.

L. 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.

M. Identify, stabilize, and manage the patient with postpartum complications and recognize indications for referral.

N. Assess, stabilize, and manage the newborn after delivery.

O. Describe the importance of the patient following up with recommended providers at the recommended times.

P. Discuss the importance of planning for future pregnancies through birth spacing/family planning, good nutrition (multivitamins/folic acid), and chronic disease management.

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.

SIMULATION TRAINING

VI. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal patients in a Level I facility should be able to:

I. Identify those maternal risk factors in the preconceptional and intrapartum periods that place the fetus and/or neonate at risk.

II. Describe the significance of normal and abnormal results from tests performed for 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 physiologic benefits of optimal cord clamping after birth, based on unit policy.

   B. Assign an Apgar score at 1 and 5 minutes after birth for all infants, and at 5-minute intervals thereafter until 20 minutes of age for infants with a score less 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 ≤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. servocontrol
6. manual control (use only to preheat the bed)
7. chemical 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 breastfeeding 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, proper patient labeling, 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 (or counselor) 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

D. Discuss the process for obtaining pre- and post-ductal oxygen saturations and the significance of the findings.

E. 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.

F. Briefly describe signs of pneumothorax and immediate stabilization of this complication.

G. Briefly describe the pathogenesis and management of pulmonary and non-pulmonary respiratory distress.

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, and neonatal pathology, in addition to recognizing 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 unit policy
2. administering feedings and / or intravenous glucose based on the neonate's blood glucose level, clinical stability, and facility and/or health care provider's instructions.

XV. Plan, provide and evaluate the nursing care of neonates with hyperbilirubinemia.

A. Define direct bilirubin (conjugated bilirubin, bilirubin glucuronide), indirect 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 breastfeeding and human milk jaundice.

H. Briefly describe 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. Describe the rationale for routine bilirubin screening prior to discharge.

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 and significance of the following tests:

1. hematocrit/hemoglobin
2. reticulocyte count
3. platelet count
4. Coombs test
5. G6PD

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. Identify antimicrobial agents appropriate for community-acquired neonatal colonization.

I. Discuss the most commonly antibiotics used for suspected/proven early onset sepsis. 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. 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 may 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.

E. Identify the infant at risk for hypoxic-ischemic encephalopathy and describe initial stabiltization.

XXI. Assess and manage the infant with suspected neonatal abstinence syndrome (NAS) / neonatal opioid withdrawal syndrome (NOWS).

A. Identify the infant at risk for NAS/NOWS and describe the nurse's role in the screening tests per unit policy.
B. Describe signs of NAS/NOWS.

C. Demonstrate use of appropriate NAS scoring systems (i.e. Finnegan, ESC).

D. Describe non-pharmacologic and pharmacologic management of NAS/NOWS.

E. Describe hospital policy regarding the mandatory reporting of NAS/NOWS cases to the Tennessee Department of Health.

F. Discuss the need to ensure a referral to TEIS for any baby diagnosed with NAS/NOWS, even if pharmacologic management was not needed.

XXII. Discuss the concept of culturally sensitive, family-centered care, utilizing current concepts in parent-infant attachment.

XXIII. Describe policies related to discharge of newborns to someone other than the birth parent.

XXIV. 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.

XXV. 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. 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.

M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect

N. Reasons for avoiding secondhand 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.)

XXVI. 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)[1].

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.

XXVII. Discuss the history, principles, and purpose of perinatal health care regionalization.

XXVIII. Identify responsibilities of the community hospital and the individual nurse in the regionalization process.

XXIX. 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.

[1] Refer to APPENDIX A, for recommendations on newborn screening procedures for infants in a special care nursery/NICU setting. Additional information may also be accessed on the Newborn Genetics Screening Program website: https://www.tn.gov/health/health-program-areas/newborn-screening/newborn-screening/newborn-genetic-screening.html.

C. Outline stabilization measures commonly used either prior to or during transport using the information in the most recent edition of The S.T.A.B.L.E. Program.

D. Utilize the most recent edition of the Tennessee Perinatal Care System *Guidelines for Transportation* as the basis for planning and managing transfer.

SIMULATION TRAINING

XXX. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal 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, including medical, sociodemographic, and genetic factors (discuss the importance of birth spacing/family planning, chronic disease management, and taking multivitamins/folic acid).

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. Discuss how health disparities and implicit bias impact health equity in regard to maternal morbidity and mortality rates.

   E. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.

   F. Describe the importance of good nutrition in pregnancy, including taking multivitamins/folic acid.

   G. Explain the benefits of breastfeeding for mother and baby.

   H. Explain the maternal and fetal effects of substance use/misuse during pregnancy, including reasons for urine drug screen (UDS) and knowing referral/treatment options.

I. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the history, physical assessment, and need for chronic disease management.

J. 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. chromosomal evaluation
4. non-stress test
5. biophysical profile
6. contraction stress test

K. Identify components which should be included in comprehensive prenatal and childbirth education. For post-delivery planning, discuss the importance of contraception for birth spacing.

L. Explain the importance and process of adequate screening for intimate partner violence (IPV) in the pregnant woman and identify resources available for those affected by IPV.

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.

INTRAPARTUM

III. Demonstrate an understanding of significant issues related to the intrapartum 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 intrapartum complications and recognize indications for referral. Examples of complications include:

1. preterm labor
2. preterm prelabor rupture of membranes
3. hypertensive disorders
4. diabetes mellitus
5. infectious diseases
6. acute obstetric emergencies (e.g., preeclampsia with severe features, abruption)
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 communication and documentation.

O. Identify indications and resources for intrapartum referral.

POSTPARTUM

IV. Demonstrate an understanding of significant issues related to the postpartum period.

A. Identify the risk status of the postpartum 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 postpartum period.

C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.

D. Outline emotional and physical support necessary for the postpartum woman and her significant others.

E. Identify risk of postpartum depression using the Edinburgh Postpartum Depression Scale (EPDS) and appropriate referral process.

F. Identify measures to promote infant safety, including safe sleep, during and after the hospital stay.

G. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

H. Describe nursing care for the breastmilk and/or formula feeding mother, including strategies to promote success.

I. Describe the risks and benefits of various methods of contraception, including immediate postpartum long-acting reversible contraception (LARC).

J. Develop, implement, and document postpartum education, including maternal and infant care and family adaptation.

K. Document discharge education for the postpartum patient including abnormal signs and importance of notifying provider.

L. 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.

M. Identify, stabilize, and manage the patient with postpartum complications and recognize indications for referral.

N. Assess, stabilize, and manage the newborn after delivery.

O. Describe the importance of the patient following up with recommended providers at the recommended times.

P. Discuss the importance of planning for future pregnancies through birth spacing/family planning, good nutrition (multivitamins/folic acid), and chronic disease management.

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.

SIMULATION TRAINING

VI. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal 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. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.

B. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.

C. Given maternal histories, identify maternal problems which might result in a preterm birth.

D. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.

E. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.

F. Describe appropriate antepartum and intrapartum fetal surveillance tests and interpret results.

G. 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 misused)
6. maternal social-sexual history
7. preexisting maternal medical conditions
8. maternal medications and anesthetics
9. multiple gestation
10. maternal use of alcohol and/or tobacco

H. 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 cardiorespiratory 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. Discuss the benefits associated with optimal cord clamping.

C. Identify babies who may be candidates for neuroprotective hypothermia and discuss the immediate care/stabilization that is recommended.

D. 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 act accordingly based on these 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 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. servocontrol
6. manual control (use only to preheat the bed)
7. chemical 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 breastfeeding 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, proper patient labeling, 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 and intermittent gastric feeding, nipple feeding, and breastfeeding 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
11. phlebitis

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 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, the respiratory system, and renal buffers compensate for acid-base imbalance.

D. Identify acceptable neonatal parameters for blood gas values (pH, PO_2, PCO_2, HCO_3, and base excess).

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.

K. Discuss the process for obtaining pre- and post-ductal oxygen saturations and the significance of the 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. breastfeeding 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. Briefly describe 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 blood 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). Discuss situations where metabolic screening should be repeated at 30 days of age[1].

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. intermittent GI suction
4. hematest on stools
5. suppository
6. changing of infant's position
7. 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.

[1] Refer to APPENDIX A, for recommendations on newborn screening procedures for infants in a special care nursery/NICU setting. Additional information may also be accessed on the Newborn Genetics Screening Program website: https://www.tn.gov/health/health-program-areas/newborn-screening/newborn-screening/newborn-genetic-screening.html.

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 may 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 develop 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) / neonatal opioid withdrawal syndrome (NOWS).

A. Identify the infant at risk for NAS/NOWS.

B. Describe signs of NAS/NOWS.

C. Demonstrate use of appropriate NAS/NOWS scoring systems (i.e., Finnegan, ESC).

D. Describe non-pharmacologic and pharmacologic management of NAS/NOWS.

E. Describe hospital policy regarding the mandatory reporting of NAS/NOWS cases to the Tennessee Department of Health.

F. Discuss the need to ensure a referral to TEIS for any baby diagnosed with NAS/NOWS even if pharmacologic management was not needed.

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. 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.

M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect

N. Reasons for avoiding secondhand 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.)

XXIII. 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.

XXIV. 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 information included in the most recent edition of The S.T.A.B.L.E. Program.

SIMULATION TRAINING

XXVI. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal 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 medical, sociodemographic, and genetic factors (discuss the importance of birth spacing/family planning, chronic disease management, and taking multivitamins/folic acid).

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. Discuss how health disparities and implicit bias impact health equity in regard to maternal morbidity and mortality rates.

E. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.

F. Explain the benefits of breastfeeding for mother and baby.

G. Discuss the importance of good nutrition in pregnancy, including taking multivitamins/folic acid.

H. Explain the maternal and fetal effects of substance use/misuse during pregnancy including reasons for urine drug screen (UDS) and knowing referral/treatment options.

I. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the pregnancy history, laboratory data, physical assessment, and need for chronic disease management.

J. 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. contraction stress test
8. doppler flow studies
9. percutaneous umbilical blood sampling (PUBS) / cordocentesis
10. chorionic villus sampling (CVS) / placental biopsy

K. 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
4. laser photocoagulation for management of twin-twin transfusion syndrome

L. Explain the importance of adequate screening for intimate partner violence (IPV) in the pregnant woman and identify resources available for those affected by IPV.

M. Identify components which should be included in comprehensive prenatal and childbirth education. For post-delivery planning, discuss the importance of contraception for birth spacing.

N. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.

O. Identify indications and resources for prenatal referral.

INTRAPARTUM

III. Demonstrate an understanding of significant issues related to the intrapartum 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 intrapartum complications and recognize indications for referral. Examples of complications include:

1. premature labor
2. preterm prelabor 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 (e.g., preeclampsia with severe features, abruption)
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 contact and optimal cord clamping as appropriate, based on maternal and newborn condition.

O. Identify the legal implications of perinatal nursing, including appropriate communication and documentation.

P. Identify indications and resources for intrapartum referral.

POSTPARTUM

IV. Demonstrate an understanding of significant issues related to the postpartum period.

A. Identify the risk status of the postpartum 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 postpartum period.

C. Identify risk factors, early symptoms, and interventions for postpartum hemorrhage.

D. Outline emotional and physical support necessary for the postpartum woman and her significant others.

E. Identify risk of postpartum depression using the Edinburgh Postpartum Depression Scale (EPDS) and appropriate referral process.

F. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

G. Identify measures to promote infant safety, including safe sleep, during and after the hospital stay.

H. Describe nursing care for the breastmilk and/or formula feeding mother, including strategies to promote success.

I. Describe the risks and benefits of various methods of contraception, including immediate postpartum long-acting reversible contraception (LARC).

J. Develop, implement, and document postpartum education, including maternal and infant care and family adaptation.

K. Document discharge education for the postpartum patient including abnormal signs and importance of notifying provider.

L. 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.

M. Identify, stabilize, and manage the patient with postpartum complications and recognize indications for referral.

N. Assess, stabilize, and manage the newborn after delivery.

O. Describe the importance of the patient following up with recommended providers at the recommended times.

P. Discuss the importance of planning for future pregnancies through birth spacing/family planning, good nutrition (multivitamins/folic acid), and chronic disease management.

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.

SIMULATION TRAINING

VI. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal 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. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.

   B. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.

   C. Given maternal histories, identify maternal problems which might result in a preterm birth.

   D. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.

   E. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.

   F. Describe appropriate antepartal and intrapartum fetal surveillance tests and interpret results.

   G. 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 use of alcohol and/or tobacco

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_2/SaO_2
3. PCO_2
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. Discuss the benefits associated with optimal cord clamping.

C. Identify babies who may be candidates for neuroprotective hypothermia and discuss the immediate care/stabilization that is recommended.

D. 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 act accordingly.

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. servocontrol
6. manual control (only used to preheat the bed)
7. chemical 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. 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 breastfeeding 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, proper patient labeling, 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 and intermittent gastric feeding, transpyloric, gastrostomy, and breastmilk / forumla 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
11. phlebitis

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, describe 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, the respiratory system, and renal buffers compensate for acid-base imbalance.

D. Identify acceptable neonatal parameters for blood gas values (pH, PO_2, PCO_2, HCO_3, and base excess).

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_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/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. Discuss the process for obtaining pre- and post-ductal oxygen saturations and the significance of the findings.

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). Discuss situations where metabolic screening should be repeated at 30 days of age[1].

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. intermittent gastric/GI suction
4. hematest on stools
5. enema or suppository
6. changing of infant's position
7. sterile protective covering of exposed organs
8. 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.

[1] Refer to APPENDIX A, for recommendations on newborn screening procedures for infants in a special care nursery/NICU setting. Additional information may also be accessed on the Newborn Genetics Screening Program website: https://www.tn.gov/health/health-program-areas/newborn-screening/newborn-screening/newborn-genetic-screening.html.

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 develop 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) / neonatal opioid withdrawal syndrome (NOWS).

A. Identify the infant at risk for NAS/NOWS.

B. Describe signs of NAS/NOWS.

C. Demonstrate use of appropriate NAS/NOWS scoring systems (i.e., Finnegan, ESC).

D. Describe non-pharmacologic and pharmacologic management of NAS/NOWS.

E. Describe hospital policy regarding the mandatory reporting of NAS/NOWS cases to the Tennessee Department of Health.

F. Discuss the need to ensure a referral to TEIS for any baby diagnosed with NAS/NOWS even if pharmacologic management was not needed.

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. 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.

M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect

N. Reasons for avoiding secondhand 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.

SIMULATION TRAINING

XXVI. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal 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 medical, sociodemographic, and genetic factors (discuss the importance of birth spacing/family planning, chronic disease management, and taking multivitamins/folic acid).

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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. Discuss how health disparities and implicit bias impact health equity in regard to maternal morbidity and mortality rates.

E. Describe the effects of exposure to teratogens on the fetus at each stage of fetal growth and development.

F. Explain the benefits of breastfeeding for mother and baby.

G. Discuss the importance of good nutrition in pregnancy, including taking multivitamins/folic acid.

H. Explain the maternal and fetal effects of substance use/misuse during pregnancy including reasons for urine drug screen (UDS) and knowing referral/treatment options.

I. Identify maternal and/or fetal risk factors based on a review of the prenatal record, including the medical history, past pregnancy history, physchosocial issues, laboratory data, problems identified in current pregnancy, physical assessment, and need for chronic disease management.

J. 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. contraction stress test
8. doppler flow studies
9. percutaneous umbilical blood sampling (PUBS) / cordocentesis
10. chorionic villus sampling (CVS) / placental biopsy
11. interventional radiology
12. Fetal MRI

K. 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
4. laser photocoagulation for management of twin-twin transfusion syndrome

L. Explain the importance of adequate screening for intimate partner violence (IPV) in the pregnant woman and identify resources available for those affected by IPV.

M. Identify components which should be included in comprehensive prenatal and childbirth education. For post-delivery planning, discuss the importance of contraception for birth spacing.

N. Discuss the care of a woman who had no or limited prenatal care or for whom no records are available.

O. Identify indications and resources for prenatal referral.

INTRAPARTUM

III. Demonstrate an understanding of significant issues related to the intrapartum period.

A. Identify the risk status of mother and fetus based on a review of recent history, past pregnancy 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. Demonstrate understanding of the maternal and fetal physiologic changes that can lead to complications in both mother and fetus.

H. Outline appropriate emotional and physical support for the laboring woman and significant others.

I. Describe the response of the mother and fetus to commonly used analgesics and types of anesthesia.

J. Identify indications, procedures, and protocols for cervical ripening and/or labor induction/augmentation.

K. Identify, recognize early, stabilize, and manage the patient with intrapartum complications and recognize indications for referral. Examples of complications include:

1. premature labor
2. preterm prelabor 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 (e.g., preeclampsia with severe features, abruption)
12. placental abnormalities (e.g., accreta, increta, percreta, and previa)
13. trauma

14. obesity (based on BMI)

L. Describe the nursing role in initiating and implementing a massive transfusion protocol, per institutional policy.

M. Describe nursing management of the surgical obstetric patient (preoperatively, intraoperatively and postoperatively).

N. 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. arterial line placement
4. hemodynamic monitoring
5. mechanical ventilation / ECMO

O. Explain the role of the nurse in assisting with the spontaneous or operative vaginal delivery.

P. 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.

Q. Identify the legal implications of perinatal nursing, including appropriate communication and documentation.

R. Identify indications and resources for intrapartum referral.

POSTPARTUM

IV. Demonstrate an understanding of significant issues related to the postpartum period.

A. Identify the risk status of the postpartum 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 postpartum period.

C. Identify risk factors, early symptoms, and initiate early interventions for postpartum hemorrhage.

D. Outline emotional and physical support necessary for the postpartum woman and her significant others.

E. Identify risk of postpartum depression using the Edinburgh Postpartum Depression Scale (EPDS) and appropriate referral process.

F. Describe, plan, and implement nursing measures to facilitate parent-infant attachment.

G. Identify measures to promote infant safety, including safe sleep, during and after the hospital stay.

H. Describe nursing care for the breastmilk and/or formula feeding mother, including strategies to promote success. Implement consults with lactation consultant.

I. Describe the risks and benefits of various methods of contraception, including immediate postpartum long-acting reversible contraception (LARC).

J. Develop, implement, and document postpartum education, including maternal and infant care and family adaptation.

K. Document discharge education for the postpartum patient including abnormal signs and importance of notifying provider.

L. 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.

M. Identify, stabilize, and manage the patient with postpartum complications and recognize indications for referral.

N. Assess, stabilize, and manage the newborn after delivery.

O. Describe the importance of the patient following up with recommended providers at the recommended times.

P. Discuss the importance of planning for future pregnancies through birth spacing/family planning, good nutrition (multivitamins/folic acid), and chronic disease management.

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.

SIMULATION TRAINING

VI. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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 perinatal 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. Given patient situations, identify neonates at risk as a result of precipitous or prolonged labor.

   B. Identify the most common examples of fetal malpresentation and describe neonatal problems which might result from each.

   C. Given maternal histories, identify maternal problems which might result in a preterm birth.

   D. Identify maternal, fetal, and iatrogenic problems which might result in fetal asphyxia.

   E. Given a variety of fetal heart rate monitor patterns, identify fetal/neonatal sequelae which might result from each.

   F. Describe appropriate antepartum and intrapartum fetal surveillance tests and interpret results.

   G. 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 misused)
      6. maternal social-sexual history
      7. preexisting maternal medical conditions
      8. maternal medications and anesthetics
      9. multiple gestation
      10. maternal use of alcohol and/or tobacco

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 cardiorespiratory 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
5. Inhaled nitric oxide (iNO)
6. Indomethacin / Ibuprophen
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. Discuss the benefits associated with optimal cord clamping.

C. Identify babies who may be candidates for neuroprotective hypothermia and discuss the immediate care/stabilization that is recommended.

D. 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 act accordingly based on these 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. servocontrol
6. manual control (only used to preheat the bed)
7. chemical 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. 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 breastfeeding 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, proper patient labeling, 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 and intermittent gastric feeding, transpyloric, gastrostomy, and breastmilk / formula 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
11. phlebitis

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, describe 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, the respiratory system, and renal buffers compensate for acid-base imbalance.

D. Identify acceptable neonatal parameters for blood gas values (pH, PO_2, PCO_2, HCO_3, and base excess).

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_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/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

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 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). Discuss situations where metabolic screening should be repeated at 30 days of age[1].

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. intermittent gastric/GI suction

[1] Refer to APPENDIX A, for recommendations on newborn screening procedures for infants in a special care nursery/NICU setting. Additional information may also be accessed on the Newborn Genetics Screening Program website: https://www.tn.gov/health/health-program-areas/newborn-screening/newborn-screening/newborn-genetic-screening.html.

4. hematest on stools
5. enema or suppository
6. changing of infant's position
7. sterile protective covering of exposed organs
8. 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 develop 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) / neonatal opioid withdrawal syndrome (NOWS).

A. Identify the infant at risk for NAS/NOWS.

B. Describe signs and symptoms of NAS/NOWS.

C. Demonstrate use of appropriate NAS/NOWS scoring systems (i.e., Finnegan, ESC).

D. Describe non-pharmacologic and pharmacologic management of NAS/NOWS.

E. Describe hospital policy regarding the mandatory reporting of NAS/NOWS cases to the Tennessee Department of Health.

F. Discuss the need to ensure a referral to TEIS for any baby diagnosed with NAS/NOWS, even if pharmacologic management was not needed.

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. 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.

M. Information regarding Shaken Baby Syndrome and other forms of child abuse / neglect

N. Reasons for avoiding secondhand 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.

SIMULATION TRAINING

XXVII. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

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. Furnish the 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. Furnish the 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 the *Textbook of Neonatal Resuscitation* published by the AHA and AAP.

III. Physical Assessment of the Newborn

A. Collaborate with the referring hospital and other transport team members in performing a thorough physical assessment prior to transport.

B. In consult with medical control physician (MCP), develop and initiate a plan which includes assessment, monitoring and interventions during transport that will address infant problems in a timely manner.

C. Furnish the receiving health care provider a complete record of both infant and maternal physical assessments, which includes information from the referring health care provider as well as the transport staff.

IV. Thermoregulation

A. Explain and understand 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. Furnish the receiving health 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 health care provider an accurate nutritional record for the receiving health care provider.

D. Provide lactation support, including proper identification, storage, and safe transport 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 fluids and blood products that may be required during transport.

C. Furnish for the receiving health care provider an accurate summary of fluids and blood products infused prior to and during transport.

VII. Medication Administration

A. Utilize knowledge of neonatal pharmacology to appropriately prepare, administer, and then monitor the medication effects on the neonate.

B. Furnish for the receiving health care provider an accurate record (drug name, dose, time, and route) of medications administered 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 significant 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 and understand 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 interventions, pharmacologic agents, intravenous fluids, 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 health 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. Furnish for the receiving health 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. Furnish for the receiving health 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. Develop 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. Furnish for the receiving health 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. Furnish for the receiving health 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, labeling and breast milk storage.

XVI. Referring-Receiving Care Provider Relationships

A. When given a report by the referring health 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 effectively communicate 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. Briefly describe 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.

SIMULATION TRAINING

XVIII. Develop and implement simulation training to meet The Joint Commission requirements. Utilize resources at Regional Perinatal Centers to assist with these efforts.

EDUCATIONAL OBJECTIVES FOR NURSES
LEVELS I, II, III, IV
AND
NEONATAL TRANSPORT NURSES

APPENDIX

SPECIAL CARE NURSERY/NICU RECOMMENDATIONS

Purpose: Infants in a special care/intensive care nursery due to prematurity, low birth weight, or illness may need to have additional blood spot filter paper specimens collected.

Nurseries should follow these procedures for infants in special care/intensive care settings:

1. Collect the initial dried blood spot specimen between 24 – 48 hours of age **even if NPO**.
2. **Exception**: Collect a dried blood spot specimen immediately (even at less than 24 hours of age) if:
    a. The infant is to be transferred to another facility. (If unable to collect prior to transfer notify the receiving facility). **OR**
    b. The infant is to be transfused collect a dried blood specimen prior to transfusion.
3. Infants weighing ≤2500 grams at birth should have a repeat blood spot specimen collected at 30 days of age to rescreen the thyroid stimulating hormone (TSH). Infants weighing ≤2500 grams at births can have a slow rise in their TSH levels.
4. Critical Congenital Heart Disease (CCHD) results may be submitted on any one of the repeat dried blood spot specimens if it was not submitted on the initial specimen.
5. Hearing results may be submitted on the repeat dried blood spot specimen if not submitted on the original or carbon copy slip that is attached to the filter paper. Note: Hearing results **SHOULD** be submitted on the initial or repeat dried blood spot specimen if possible. ONLY submit on the "carbon copy slip" if there is not a dried blood spot specimen to be collected or it has already been submitted to the lab. If there is NOT a "carbon copy slip" or repeat dried blood spot specimen then use the "Hearing Only" form which can be found online: https://www.tn.gov/content/dam/tn/health/program-areas/newborn-screening/Hearing-Only-Form.pdf. Hospitals that use Mednax for their hearing screenings will have results automatically uploaded to the state.
6. If the infant did not have a valid hemoglobinopathy (Hgb) screen prior to transfusion and only needs Hgb testing (if all other screens have been submitted), nurseries should submit the repeat screen or include the repeat screen order in the infant's discharge instructions according to the following procedures:
    a. For infants <6 months of age at time of collection: Submit a repeat filter paper to the State Laboratory 3 months after the last transfusion.
    b. For infants >6 months of age at the time of collection, send an EDTA microvette tube to Meharry.

SPECIAL NOTES:

- Infants with screen positive and/or clinical findings may need to have a repeat specimen collected per special instructions by the Newborn Screening Program or clinician.
- Infants with possible Hemoglobin disease or trait that are <37 weeks or <2500 grams should have a microvette tube sent to Meharry Sickle Cell Center at 6-8 weeks of age for disease or trait confirmation.
- Infants that receive TPN, should have a repeat newborn screening collected 24 hours after the TPN is discontinued and before discharge

Department of Health Authorization No. 343481.
This Electronic publication was promulgated at zero cost.
October 2022