CHAPTER 1

PROFESSIONAL RESPONSIBILITIES IN THE PROVISION OF NEWBORN CARE

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Newborn care is provided by a wide variety of providers, ranging from nurse practitioners, certified nurse–midwives, certified midwives, and certified professional midwives, to clinical nurse specialists, physicians, and physician assistants. Education with a focus on the newborn and initial month of life ensures the stabilization and ongoing transition of the baby from birth. Care of the newborn requires the provider to not only have current expertise but also be cognizant of and meet the standards of care.

The purpose of such standards is to assist clinicians in providing effective neonatal health services, and to encourage them to use resources appropriately to achieve optimal healthcare outcomes. The term newborn resulting from an uncomplicated pregnancy and birth requires more surveillance—rather than intervention—after the initial stabilization. Neonatal resuscitation guidelines label this practice "routine care." Early surveillance and development of a plan of care provides a foundation for the baby to make the transition to extrauterine life and thrive in the first month of life.

While the information included in this text is addressed to nonphysician providers, the content is not specific to any particular profession. In 1980, the American Nurses Association (ANA, 1980) defined nursing as "the diagnosis and treatment of the human response to actual or potential health problems." In 2003, the ANA updated the definition of nursing to include the following elements:

- The protection, promotion, and optimization of health and abilities
- Prevention of illness and injury

- Alleviation of suffering through the diagnosis and treatment of the human response to actual or potential health problems
- Advocacy in the care of individuals, families, communities, and populations

A newer definition of nursing includes important components of the ANA's (2015a) *Code of Ethics for Nurses.*

In addition, advanced clinicians (i.e., certified nurse–midwives [CNM], certified midwives [CM], certified professional midwives [CPM], nurse practitioners [NP], clinical nurse specialists [CNS], and certified registered nurse anesthetists [CRNA]) are responsible for taking medical histories, performing physical examinations, performing diagnostic testing, establishing diagnoses, and providing treatments. Consultation, collaboration, co-management, and referral of the patient to medical colleagues and other health professionals, when necessary, are other responsibilities of the advanced practice provider.

The newly born human infant and the neonate (defined as an infant from birth through the first 28 days of life) rely on nurses and advanced practice providers to render care that meets national, state, and local standards. This chapter outlines the professional responsibilities of such healthcare providers, including an overview of why newborns are different; professional practice including standards of care, scope of practice, and evidence-based practice; and ethical and legal guidelines that apply to all providers of care to newborns and neonates.

Why Newborns Are Different

The newborn/neonate is a unique patient who, although unable to communicate with language, communicates with astute, observant, and educated care providers through his or her behavior. Newborns/neonates rely on their care providers, both professional and parental, for prompt, safe, and effective interpretation of their behaviors so that the correct care is provided. Delay in action or misinterpretation of behaviors or signs and symptoms of illness may result in lifelong morbidity, and sometimes even mortality.

Newborns/neonates are anatomically, physiologically, and developmentally different from older infants, children, and adults (**Table 1-1**). Pediatrics—that is, the care of children and their families—is a subspecialty in health care that requires specialized knowledge, skills, and expertise. Pediatric patients are *not* miniature adults, and newborns are *not* miniature infants or adults. Expertise in care of older infants, children, and adults does not enable a care provider to be competent (i.e., safe) in the care of newborns or neonates.

Neonatology—that is, care of newborns from birth through the first 28 days of life—is a subspecialty of pediatric medicine and nursing. Although care of sick children and their parents is part of the curriculum in most health care (medicine, nursing, and midwifery)

Table 1-1: Why Newborns/Neonates Are Different

System	Anatomic/Physiologic Difference	Developmental Immaturity
Respiratory (Gardner, Enzman, & Nyp, 2016)	22–24 weeks' gestation: Differentiation into type I and type II cells (type II create and store surfactant).	Lung development related to gestational age. Surfactant deficiency causes alveolar collapse and is the cause of respiratory distress syndrome in premature lungs.
	24–40 weeks' gestation: Lung differentiates into alveolar ducts and alveoli; decreased mesenchyme and pulmonary capillaries approximate alveoli for gaseous exchange.	Prior to 24–40 weeks, the fetal lungs are incapable of supporting adequate gaseous exchange.
	At term, the number of airways is complete, sufficient for gaseous exchange, and the pulmonary capillary bed is sufficient to carry the gases exchanged.	Continues to develop from birth to about 8 years of age. Ongoing lung development enables infants who suffer severe lung disease at birth to "outgrow" their disease.
	Smaller size, number, and shape of alveoli; smaller diameter of airways.	
	The first breath of life occurs as a result of changes in temperature, handling, and changes in PaO_2 and $PaCO_2$. Exposure of the lung to oxygen decreases pulmonary vascular resistance, increases pulmonary blood flow from 10% in fetal life to 100% in neonatal life, and results in increased pulmonary perfusion and oxygenation.	
	The closer an infant is to term gestation, the more musculature there is around the pulmonary capillary bed. Sudden increases or decreases in oxygen concentration	Adjusting supplemental oxygen, especially lowering the concentration, must be done slowly and in small increments (i.e., 2% to 5%) to avoid the *flip-flop*

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Table 1-1: Why Newborns/Neonates Are Different (***Continued***)

System	Anatomic/Physiologic Difference	Developmental Immaturity
	may result in a disproportionate increase or decrease in PaO_2 caused by vasodilation or vasoconstriction.	*phenomenon.* Lowering oxygen concentration, or any hypoxic insult, initiates pulmonary vasoconstriction, which causes hypoperfusion and increased pulmonary vascular resistance.
Cardiac (Gardner, Enzman, & Nyp, 2016)	The first breath of life initiates the change from fetal to adult cardiac circulation as the ductus arteriosus closes in the presence of oxygen and the foramen ovale closes in the presence of increased left-sided heart pressure. The ductus venosus in the liver is an anatomic shunt that also closes at birth.	The ductus arteriosus is functionally closed at birth, but is anatomically closed only at around 3 months of age. Any hypoxia event occurring before anatomic closure results in opening of the ductus arteriosus. The combination of pulmonary hypoperfusion and increased pulmonary vascular resistance in the lungs and the opening of the ductus arteriosus is a return to fetal circulation, a pathologic condition called persistent pulmonary hypertension of the newborn (PPHN).
Central Nervous System (CNS)		
Thermoregulation (Altimier, 2012; Gardner & Hernandez, 2016a)	Humans are homeotherms—able to increase and decrease body temperature so as to maintain normal core temperature over a wide range of environmental temperatures. The first neonatal organ that responds to cold stress is the skin. A skin temperature of 36.5°C (97.7°F) is the temperature at which a newborn is thermal neutral or is in a thermal neutral environment (i.e., the	At birth neonates are able to respond as homeotherms, but within a narrower body temperature range than an adult. The basal metabolic rate of a newborn is twice that of an adult, so more energy is necessary to maintain normal body temperature.

System	Anatomic/Physiologic Difference	Developmental Immaturity
	temperature at which oxygen consumption and basal metabolic rate are minimal). Waiting for the core temperature (i.e., rectal temperature) to fall is too late for intervention.	
	Skin-to-skin care with parents at and after birth maintains thermal neutrality in newborns. In response to a drop in the newborn's temperature, mothers automatically raise their body temperature (a process called thermal synchrony) to warm their infant.	Lack of subcutaneous fat for insulation, lack of brown fat for nonshivering thermogenesis, and lack of the ability to flex to conserve heat compromise the preterm infant's ability to maintain thermal neutrality. In addition, the hypothalamus of a preterm infant is immature and unable to maintain temperature. The ability to maintain normal body temperature is related to gestational age. Younger, smaller neonates, including late-preterm infants (34 0/7 to 36 6/7 weeks' gestation), are unable to maintain their own body temperature and may need assistance.
	Term newborns may be able to sweat, first on their foreheads, then on their chest, upper arms, and lower body.	Infants less than 36 weeks' gestation do not have the ability to sweat, so they are unable to cool themselves if they are environmentally overheated or if they are febrile.
Pain (Gardner, Enzman, & Agarwal, 2016)		Myelination of pain pathways occurs between 30 and 37 weeks' gestation. Unmyelinated fibers carry pain stimuli more slowly, but in the neonate this is offset by the shorter distance the impulse must travel.

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Table 1-1: Why Newborns/Neonates Are Different (***Continued***)

System	Anatomic/Physiologic Difference	Developmental Immaturity
	Neonates, including preterm infants, have a CNS that is mature enough to carry and interpret pain stimuli.	Pain perception is well developed in the premature infant, but the inhibitory ability of the CNS to pain is not well developed. Therefore, neonates of younger gestational ages experience more—rather than less—pain. With decreasing gestational age, behavioral pain responses are less robust because of the immaturity of the CNS.
	Pain responses include behavioral, physiologic, and metabolic/ hormonal changes.	
Sensory (Gardner, Goldson, & Hernandez, 2016)	At birth, term newborns have fully developed and functional sensory perception: • Hearing: Have been hearing since 20–22 weeks in utero; react to loud noises; able to distinguish parents' voices from those of strangers; turn toward auditory stimuli; able to turn toward preferred story heard in utero.	
	• Vision: Able to see light/dark in utero; able to see 8–10 inches from face; able to distinguish/prefer parents' faces; able to follow objects horizontally/ vertically; prefer human face and patterns; recoil from bright light.	Eyes are fused until approximately 26 weeks' gestational age.
	• Smell/taste: Able to taste flavors in utero and know mother's scent from scent in amniotic fluid; able to find maternal nipple by smell; by 5 days of age, term babies are able to turn toward own mother's nursing pad and start sucking; recoil from unpleasant smells	Unable to differentiate salty solution.

System	Anatomic/Physiologic Difference	Developmental Immaturity
	(vinegar, ammonia) and tastes (bitter, acid, sour); prefer sweet taste. • Tactile/kinesthetic: Major method of communication and highest developed sense. Touch is especially well developed in face, around lips (root reflex), and in the hands (grasp reflex). Able to "read" an adult by the manner in which the adult handles and cares for the infant. • Communication: Crying is the language newborns and infants use to communicate their needs. Crying may also be a response to a noisy, cold, boring, or over-stimulating environment. The more responsive adults are to the infant's cries and needs, the less crying is necessary. Infants learn to associate comfort with the responsive caregiver.	Noxious smells cause apnea in younger gestational-age infants.
Circadian rhythm/ sleep–wake cycles (Gardner, Goldson, & Hernandez, 2016)	Humans cycle body functions (i.e., blood pressure, temperature, hormonal changes, urine volume, and sleep–wake) in a 24-hour period. Active sleep: Rapid eye movements (REM) and muscle activity such as sucking, rooting, and startles. Adults dream in REM sleep. Quiet sleep: No rapid eye movement (non-REM).	Development of circadian rhythms in infants is influenced by genetic factors, gender, brain maturation, and the environment. At birth and in the first few weeks of life, term newborns begin sleep in active (rather than quiet) sleep, spend more time in active sleep than do adults, sleep 16–19 hours/ day, and distribute their sleep over a 24-hour period. Infant sleep-cycle duration: 50–60 minutes.

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Table 1-1: Why Newborns/Neonates Are Different (*Continued*)

System	Anatomic/Physiologic Difference	Developmental Immaturity
	Adult sleep-cycle duration: 90–100 minutes. Maturation of infant sleep: Better organization of sleep states, decrease in total sleep time, increased quiet sleep, decrease in active sleep, and increase in active and quiet waking. Term newborns develop day–night cycling that is similar to adult cycles of wakefulness and sleep by 9 months of age.	At birth, newborns may still be operating on their "in utero" clock: More active/more quiet behaviors correspond to activity/quiet cycles as a fetus. Gradually, through caregiving, parents teach the infant synchronization with family rhythms.
Neurologic conditions/ presentations (Gardner, Enzman, & Nyp, 2016; Gardner, Goldson, & Hernandez, 2016; Parsons, Seay, & Jacobson, 2016)	At birth newborns display reflexive, unlearned behaviors :	Reflex behaviors are influenced by gestational age:
	• Survival behaviors:	
	Root reflex—finding food	Begins at 28 weeks' gestation; integrates at 3 months of age. Response is less if the baby is sleepy or satiated.
	Sucking—removing food	Begins at 26–28 weeks' gestation.
	Swallowing—ingesting food	Begins at 12 weeks' gestation. Not effectively coordinated for oral feedings before 32–34 weeks' gestational age. Coordination of respiration with sucking/ swallowing is consistently achieved by infants more than 37 weeks' postconceptual age.
	• Protective behaviors:	
	Moro reflex	Begins at 28 weeks' gestation.
	Palmar grasp	Begins at 28 weeks' gestation.
	Plantar grasp	Begins at 28 weeks' gestation.
	Babinski reflex	Begins at 28 weeks' gestation.
	Tonic neck reflex	Begins at 35 weeks' gestation.

System	Anatomic/Physiologic Difference	Developmental Immaturity
	Gag reflex	Begins at 36 weeks' gestation. Protects against aspiration and never disappears.
	Blink reflex	Begins at 25 weeks' gestation. Does not disappear.
	Crossed extension	Begins at 28 weeks' gestation.
	Pulmonary ventilation:	
	Breathing is controlled by the neural and chemical systems. The cerebral cortex and brain stem regulate respiratory rate and rhythm. The medulla contains the chemical control system that is sensitive to changes in oxygen and carbon dioxide levels.	In response to hypoxemia, newborns have a brief period of increased ventilation, followed by respiratory depression and even apnea.
	In response to hypoxemia, adults have a sustained increase in ventilation.	Neuronal immaturity is a cause of apnea because respiratory efforts are more unstable at younger gestational ages. Primary apnea or apnea of prematurity occurs when premature infants (including the late-preterm infant) cease respirations for more than 20 seconds and have no other cause for their apnea.
		Because primary apnea or apnea of prematurity is a diagnosis of exclusion, secondary apnea due to other causes must be ruled out. Other causes of secondary apnea may include infection, seizures, airway obstruction, respiratory/cardiac diseases, vomiting/aspiration, drugs, hypoglycemia, hypocalcemia, hypothermia, stooling, position, pain, and anemia.
	Neonatal seizures are among the most frequent signs, and occasionally the only sign, that there is CNS dysfunction.	Clinical presentation of neonatal seizure is more subtle and less organized than seizure presentations in older children and adults. This subtle presentation of seizures depends on gestational

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Table 1-1: Why Newborns/Neonates Are Different (*Continued*)

System	Anatomic/Physiologic Difference	Developmental Immaturity
	Seizures occur more frequently in the neonatal period than at any other period of life (Volpe, 2008). Neonatal seizures may be caused by acute or chronic disorders of the brain, including metabolic conditions, genetic metabolic conditions, infections, hemorrhage, and hypoxic-ischemic encephalopathy. Congenital malformations, drug withdrawal, kernicterus, local anesthetic intoxication, and familial and idiopathic seizures are also possible causes.	age, so that premature infants present with even less organized seizure activity than term infants (Volpe, 2008).
Immune System		
Antiallergenic	Maternal intake of cow and/or soy protein may sensitize the fetus.	Newborns sensitized in utero to cow and/or soy protein (Kattan, Cocco, & Jarvinen, 2011; Klemola et al., 2002; Martinez & Ballew, 2011).
Anti-inflammatory/ anti-infective (Gardner, 2008, 2009; Gardner & Lawrence, 2016)	Maternal antibodies are passed through the placenta to the fetus. Colonized with maternal flora if born vaginally; colonized with institutional flora if born by cesarean section. Antibodies to all infections that the mother has had or been immunized against are passed through maternal breastmilk. Breastmilk has anti-infective and anti-inflammatory properties, as well as nucleotides, that protect newborns/neonates from inflammation and infection.	Immature immune system that is gestational age-specific: • Less nonspecific (inflammatory) immunity • Less specific (humoral) immunity • Less passive immunity • No local inflammatory reaction to portal of entry of infection Undernourished/growth-restricted infants of any gestational age are more prone to infections because of the effect of under-nutrition on the immune system.

System	Anatomic/Physiologic Difference	Developmental Immaturity
Hematologic		
Hyperbilirubinemia (Kamath-Rayne, Thilo, Deacon, & Hernandez, 2016)	Red blood cells' (RBC) life span in adults: 120 days. Neonates have higher RBC mass per kilogram weight when compared to adults.	RBCs' life span in neonates: 70–90 days.
	Neonates' rate of bilirubin production (8–10 mg/kg/h) is 2–2.5 times higher than that in adults. Accelerated RBC breakdown accounts for 75–85% of increased bilirubin levels in newborns.	Ability of liver to handle bilirubin production related to gestational age: The younger the gestational age, the more problems the infant will have in managing bilirubin.
	Enterophepatic circulation of bilirubin results when conjugated bilirubin (in the meconium in the large intestine) is converted by beta-glucuronidase back into glucuronic acid and unconjugated bilirubin and is reabsorbed.	Compared to full-term newborns, late-preterm newborns: • Have peak bilirubin levels later (5–7 days of life) • Are 2.4 times more likely to develop significant hyperbilirubinemia • Are readmitted to the hospital for treatment of bilirubin 2–2.5 times more often Developmental immaturity of the glucuronyl-transferase system causes hyperbilirubinemia in late-preterm infants.
	Physiologic jaundice in normal full-term newborns: • Phase I: Mean peak total serum bilirubin (TSB) of 5–6 mg/dL between 3 and 4 days of life. • Phase II: Rapid decline in TSB to 3 mg/dL by the end of first week of life, until the normal adult level of 2 mg/dL is reached at the end of the second week of life.	Physiologic jaundice excluded in full-term newborn: • Clinical jaundice in first 24 hours of life. • TSB concentration increases more than 0.2 mg/dL/h. • TSB concentration exceeds 95th percentile for age in hours. • Direct serum bilirubin level is more than 1.5–2 mg/dL. • Clinical jaundice persists more than 2 weeks.

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Table 1-1: Why Newborns/Neonates Are Different (***Continued***)

System	Anatomic/Physiologic Difference	Developmental Immaturity
Gastrointestinal (GI)	GI tract is anatomically complete by 20–22 weeks' gestation. Functional development begins in utero and continues into infancy (Brown et al., 2016). GI functions that are activated at birth, regardless of the length of gestation: • Decreased intestinal permeability • Increased mucosal lactase activity GI functions that are intrinsically programmed to occur at a specific postconceptual age: • Onset of peristalsis at 28–30 weeks • Coordination of suck, swallow, and breathing at 33–36 weeks GI functions that are influenced by the environment: • Colonization by bacteria at birth • Introduction of enteral nutrients into the GI tract, which promotes ongoing maturation and development of the GI tract Colic, excessive air in the GI tract, and/or gastroesophageal reflux disease (GERD) may present with fussiness/irritability, gassiness, and crying. Other symptoms of GERD include distress with regurgitation, refusal to feed, painful swallowing, arching of the back, aspiration, apnea/bradycardia, and emesis, resulting in complications or decreased quality of life for the	Infants born before term gestation, including late-preterm infants, have anatomic and functional limits to the tolerance and digestion of enteral nutrition (Brown et al., 2016): • Neurologic immaturity influences coordination of suck, swallow, and breathing and GI motility. • Peristalsis that is bidirectional with forward movement toward the stomach develops near term gestation. • Intermittent relaxation of the lower esophageal sphincter muscle, combined with abnormal peristalsis, contributes to GERD. • Immature, disorganized intestinal motor activity compared to term infants; maturation of motor activity occurs between 33 and 40 weeks' gestation • Increased lactase activity with enteral feeding approaches full-term infant levels by 10 days after birth.

System	Anatomic/Physiologic Difference	Developmental Immaturity
	infant and family (Bhatia & Parish, 2009; Neu et al., 2012; Vandenplas & Alarcon, 2015). Nearly 73% of term infants experience at least one episode of regurgitation/day, with the highest rate in the first month of life (Hegar et al., 2009). No symptoms of irritability or discomfort accompanying regurgitation results in these infants being called "happy spitters" (Hegar et al., 2009).	Regurgitation—the involuntary return of previously swallowed formula or secretions into or out of the mouth—is a benign, normal process due to (Hegar et al., 2009; Hyman et al., 2006): • Shortened esophagus • Immaturity of the esophagus and stomach • The obtuse angle of His • Reduced esophageal pressure • A diet of liquids
Glucose Homeostasis (Rozance, McGowan, Price-Douglas, & Hay, 2016)	At birth, both glucose supply and serum glucose concentrations fall. After birth, catecholamine levels increase, as do glucagon concentrations and receptor sensitivity. Increased glucagon and norepinephrine levels induce glycogenolysis, and hepatic glucose is released. Increased levels of catecholamines release fatty acids that are metabolized into precursors for gluconeogenesis. Glucose homeostasis is the result of the balance between hepatic glucose output (rate of glycogenolysis and gluconeogenesis) and glucose utilization by the brain and peripheral tissues.	Causes of hypoglycemia: • Inadequate substrate supply • Abnormal endocrine regulation of glucose metabolism • Increased rate of glucose utilization Peripheral glucose utilization varies depending on the metabolic demands placed on the newborn. Normal term newborns' steady-state glucose production/utilization rate is 4–6 mg/min/kg—twice the weight-specific rate of adults.

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Table 1-1: Why Newborns/Neonates Are Different (***Continued***)

System	Anatomic/Physiologic Difference	Developmental Immaturity
	Perinatal glucose utilization increases in: • Hypoxia, due to inefficiency of anaerobic glycolysis • Hyperinsulinemia, which increases glucose uptake by insulin-sensitive tissues • Respiratory distress, due to increased muscle activity • Cold stress, which leads to increased sympathetic nervous system activity with release of norepinephrine, epinephrine, and thyroid hormones, which increase metabolic rate	
Nephrology/Renal (Cadnapaphornchai, Schoenbein, Woloschuk, Soranno, & Hernandez, 2016)	The fetal kidney regulates amniotic fluid balance. By 34–35 weeks' gestation, the kidney contains the adult complement of 600,000 nephrons. Extracellular fluid (ECF) volume of the term newborn is 40%. The newborn kidney reduces ECF during the first week of life, so that body weight may decrease by 10%. A marked increase in the glomerular filtration rate (GFR) occurs after term birth. Newborns have a limited capacity to concentrate urine.	Preterm birth decreases the number of nephrons compared to the number in full-term newborns. Undernourished/growth-restricted and extremely low-birth-weight newborns may never achieve a normal number of nephrons. Risk of intravascular volume depletion is higher when fluid intake is limited; infants become dehydrated more quickly if intake is inadequate.

System	Anatomic/Physiologic Difference	Developmental Immaturity
Skin	Skin receptors sense environmental temperature and the rate of temperature change. Skin receptors, located throughout the body, are especially concentrated in the trigeminal area of the face. Both peripheral and central receptors send messages to the hypothalamus of the brain, which controls conservation, dissipation, and production of body heat.	A decrease in core temperature in adults is the impetus for heat production, whereas a decrease in skin temperature is the impetus for heat production in the neonate. In the first week of life, the immaturity of a newborn's skin—even a term baby's skin—is the largest contributor to heat loss through evaporation.
Hormonal	Response to cold stress (Altimier, 2012). Hormonal/catabolic stress response to uncontrolled pain (Gardner, Enzman, & Agarwal, 2016): • Increased: plasma renin levels; catecholamine levels (epinephrine/norepinephrine); cortisol levels; nitrogen excretion/protein catabolism; release of growth hormone, glucagons, and aldosterone; serum levels of glucose, lactate, pyruvate, ketones, and nonesterified fatty acids • Decreased: insulin secretion, prolactin, immune responses	Insufficient amounts of epinephrine and norepinephrine may dampen the newborn's response to cold stress. Decompensatory phase in which the body is unable to maintain "fight or flight" response: Vital signs return to normal, complicating the assessment for pain, but the newborn is still in pain (Gardner, Enzman, & Agarwal, 2016).

programs, care of well newborns is usually relegated to a few days of caring for normal term newborns and their mothers. The subspecialty of neonatal nursing is learned on the job and in graduate and doctoral advanced practice preparation. *All* advanced practice providers—CNMs, CMs, CPMs, NPs (i.e., family, pediatric, and neonatal), and CNSs—who care for newborns and neonates must be educated to care for this special, resilient, yet fragile pediatric population.

The following principles of neonatal assessment govern care of the newborn and neonate, regardless of the type of provider:

- *The younger the child, the more quickly care providers need to diagnose and treat the child.* For example, when considering postnatal age, a 4-hour-old infant needs care faster than a 4-day-old infant, who needs care faster than a 4-week-old infant. Postconceptual age also needs to be considered. Late-preterm infants, defined as those from 34 6/7 to 36 6/7 weeks' gestation (Engle, 2006), have increased morbidity and mortality when compared to full-term (39–40 weeks' gestation) infants.
- *Care of a newborn or neonate involves care of the whole family.* Parents must be taught how to read and interpret infant cues, how to know if their infant is acting differently, and who to contact if they have concerns about their infant. Newborns and neonates cannot verbalize that they are having a "hard time breathing" or "it hurts here"—parents and caregivers need to be able to objectively discern this information, know the significance, and take immediate action. A change in feeding behavior is often the earliest symptom perceived by parents. An 8-day-old full-term baby with a history of demanding and feeding every 1 to 3 hours who is now not demanding, is difficult to awaken, or refuses to feed needs to be evaluated immediately by the care provider. Normal, healthy, full-term 8-day-old babies do not change their feeding behavior for no reason!
- *Neonatal signs and symptoms of illness are subtle and may be caused by numerous etiologies that have to be ruled in and out.* For example, the full-term newborn who shows the change in feeding behaviors mentioned previously needs to be assessed for all of the following:
  - Hypoglycemia: This condition is not as common in full-term infants, but hypoglycemic infants feed poorly. A point-of-care (POC) glucose screening test can quickly rule hypoglycemia in or out of the differential diagnosis.
  - Hyperbilirubinemia: Is this baby visibly jaundiced? Jaundice can be a symptom of neonatal infection. Hyperbilirubinemia makes babies sleepy and can be a cause of poor feeding.
  - Dehydration: Is this baby's intake sufficient to maintain adequate intake of fluids (and calories)? By the end of the first week of life, a neonate should be gaining weight at the rate of ½–1 oz/day. Weigh the baby and compare the result to the last weight.
  - Neonatal infection/sepsis: Is this baby infected? Besides feeding changes, how are the vital signs (temperature, pulse, respirations, blood pressure, pain) and perfusion (capillary refill time, mottling, cyanosis, pallor)? Are there any obvious sites of infection on physical examination, such as an erythematous, indurated area around the umbilicus or the baby's mouth coated with oral thrush? In infants with infection, physical examination of the abdomen may show distention, pain with palpation, and

a bloody stool. A pulse oximetry evaluation of 85% saturation in room air is worrisome. A hypotonic, floppy baby who does not respond to the physical examination with crying or respond to the heel stick may have sepsis.

Defining the Healthcare Provider's Practice

Professional Nursing and Midwifery Practice

Standards of Care and Practice From a legal standpoint, professional nursing care providers are responsible and accountable to provide the standard of care to their patients. The standard of care is defined as care given by a reasonably prudent provider, advanced practice nurse, or midwife (or physician assistant or physician) in the same or similar circumstances (Meissner-Cutler & Gardner, 1997). Professionals are responsible and accountable to provide their patients with the national, state, and local standard of care. The standard of care for specialty practice (e.g., families, newborns, and neonates) constantly changes based on research and technology. Professional nurses and advanced practice nurses are required by the *Code of Ethics for Nurses* (ANA, 2015a) and their state nurse practice acts to remain competent. Likewise, midwives are required by the American Midwifery Certification Board (AMCB), the International Confederation of Midwives (ICM), and their respective state laws and regulations to maintain competency in the care of newborns.

Standards of nursing care and practice are promulgated by professional nursing organizations, regulatory agencies, and legislative bodies (Enzman Hines, 2012). The American Nurses Association creates and publishes standards that apply to all professional nursing practitioners and provides the template, based on nursing process and diagnosis, for specialty nursing standards (ANA, 2015b). **Table 1-2** outlines these universal standards as well as specialty practice standards for nurses and advanced practice nurses caring for mothers, newborns, and neonates. In addition to standards created by nursing and midwifery organizations, standards, guidelines, and position statements for care are promulgated by midwifery, neonatal, and pediatric organizations that must also be considered and followed by healthcare practitioners (Table 1-2).

The standard (scope) of practice is defined in each state's nurse (or medical) practice act. In a few instances, independent boards regulate the practice of midwives. State practice acts outline and define the activities within the scope of practice for a given type of provider. The standard of care is also defined and delineated in institutional policies, procedures, and protocols.

A birth center or hospital maternal–newborn service must have policies, procedures, guidelines, and protocols that meet the following criteria:

- Reflect the national and state standard of care
- Are periodically updated and dated

Table 1-2: Standards of Care and Practice for Specialty Care Providers for Families, Newborns, and Neonates

Organization	Standards	Description
American Nurses Association (ANA) • First nursing organization (1911) • First definition of professional nursing (1932) • First standards of nursing practice (1973)	1980: *Nursing: A Social Policy Statement*	Defines basic standards of professional nursing practice; differentiates between standards of care and standards of professional practice. Defines nursing and clarifies the nature and scope of nursing practice.
	2015: *Nursing: Scope and Standards of Practice*, 3rd ed.	Defines basic standards for all types of nursing practice; encompasses minimally acceptable levels of nursing care and nursing performance.
	2015: *Code of Ethics for Nurses with Interpretive Statements*	Defines nine components of nursing's ethical code of conduct and establishes the ethical standard for the nursing profession. The code is not negotiable in any setting, nor is it subject to revision or amendment except by the ANA.
American Nurses Association (ANA) and National Association of Neonatal Nurses (NANN)	2013: *Scope and Standards of Practice for Neonatal Nursing*, 2nd ed.	Defines the responsibilities and accountability to the public and the nursing profession of all registered nurses who care for high-risk neonates and their families.
American College of Nurse–Midwives (ACNM) • Roots dating to 1929 • Professional organization of certified nurse–midwives (CNM) and certified midwives (CM)	2011: *Standards for the Practice of Midwifery*	Presents 8 standards of CNM and CM practice related to qualifications and a safe environment; supports individual rights and self-determination

Organization	Standards	Description
		within the boundaries of safety, culturally competent care, with written practice guidelines, documented completely and in an accessible form, evaluated for quality management that includes a plan to identify and solve problems, and expansion beyond ACNM core competencies.
	2012: *Definition of Midwifery and Scope of Practice for Certified Nurse–Midwives and Certified Midwives*	Defines CNMs and CMs who, after their midwifery education, must demonstrate that they meet the *Core Competencies for Basic Midwifery Practice* of the ACNM (2012a) and must practice within the ACNM's *Standards for the Practice of Midwifery* (2011).
Provides standard setting documents to articulate Women's Health and Newborn Care	2015: *Code of Ethics with Explanatory Statements*	Describes midwifery code of conduct.
	2011: *Position Statement Breastfeeding*	Provides midwifery support for and involvement with breastfeeding to ensure success.
	2012: *Core Competencies for Basic Midwifery Practice, VI. Newborn Care Core Competencies*	Articulates the specialized knowledge, skills, and basic competencies of midwifery practices attained in formal education program.
Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) • Founded in 1969 • Published first standards in 1974 • Became an independent organization in 1993	2006: *Hyperbilirubinemia: Identification and Management in Healthy Term and Late Preterm Infants*, 2nd ed.	Clinical practice monograph for nurses about hyperbilirubinemia that supports the 2004 AAP guideline on universal screening of all neonates before discharge from the hospital.

(*Continued*)

Table 1-2: Standards of Care and Practice for Specialty Care Providers for Families, Newborns, and Neonates (*Continued*)

Organization	Standards	Description
	2007: *Neonatal Nursing Clinical Competencies and Education Guide*, 6th ed.	A framework for the specialized knowledge, skills, and competencies necessary for evidence-based neonatal nursing practice. Used for orientation and continuing education for all levels of neonatal nurses.
	2009: *Standards for Professional Nursing Practice in the Care of Women and Newborns*, 7th ed.	Describes specialty-specific practice standards for inpatient and outpatient care.
	2013: *Evidence-Based Clinical Practice Guideline: Neonatal Skin Care,* 3rd ed.	Clinical practice guideline on care of neonatal skin based on the latest research evidence.
	2014: *Assessment and Care of the Late Preterm Infant*	Evidence-based clinical practice guidelines for nursing care and advanced practice nursing care of the late-preterm infant.
	2015: *Breastfeeding*	Position statement about the importance of supporting, protecting, and promoting breastfeeding as the optimal nutrition for human newborns.
National Association of Neonatal Nurses (NANN) • Founded in 1984 • Consists of subspecialty interest groups (i.e., clinicians, practitioners, clinical nurse specialists, transport nurses, and educators) • Promulgates standards on practice and education	2010: *Prevention of Acute Bilirubin Encephalopathy and Kernicterus in Newborns*	Position statement #3049 recommends universal screening of all newborns with either serum or transcutaneous bilirubin levels, parent education, and follow-up after discharge.
	2013: Walden & Gibbens: *Newborn Pain Assessment and Management Guideline for Practice*, 3rd ed.	Clinical practice guideline on best evidence-based practices in pain assessment and management for full-term and premature newborns.

Organization	Standards	Description
National Association of Pediatric Nurse Practitioners (NAPNAP) • Established in 1973	2010: *PNP's Role in Supporting Infant and Family Well-Being in the First Year of Life*	Position statement about the PNP's role and skills in providing care for newborns and infants and their families.
• Dedicated to improving the quality of health care for infants, children, and adolescents by advancing the pediatric nurse practitioner's (PNP) role in providing pediatric care	2012: *Breastfeeding*	Position statement about the importance of PNPs in educating, promoting, and supporting breastfeeding as optimal infant nutrition.
American Academy of Pediatrics (AAP) and American College of Obstetrics and Gynecology (ACOG) (with a liaison representative from NANN)	2012*: Guidelines for Perinatal Care*, 7th ed.	Evidence-based recommendations to improve pregnancy outcomes, reduce maternal and perinatal mortality and morbidity, ensure safe and effective diagnostic and therapeutic interventions in maternal–fetal and neonatal care. Revised definitions of levels of care.
American Academy of Pediatrics (AAP), Committee on Fetus and Newborn American College of Obstetricians and Gynecologists (ACOG) American Society of Pain Management Nurses	2012: "Circumcision Policy Statement" 2001: "Committee Opinion #260: Circumcision" 2011: *Position Statement: Male Infant Circumcision Pain Management*	Policies and position statements about the need to relieve the pain of male infants while being circumcised as well as after the procedure.
American Academy of Pediatrics (AAP) and American Heart Association (AHA)	2011: Neonatal Resuscitation Program (NRP) (Kattwinkel, 2011)	Provides training for care providers in the equipment and skills necessary and the evidence to support the scientific consensus of the International Liaison Committee on Resuscitation (ILCOR).

(*Continued*)

Table 1-2: Standards of Care and Practice for Specialty Care Providers for Families, Newborns, and Neonates (*Continued*)

Organization	Standards	Description
Adamkin and American Academy of Pediatrics (AAP), Committee on Fetus and Newborn	2011: *Postnatal Glucose Homeostasis in Late-Preterm and Term Infants*	Guideline for the screening and management of neonatal hypoglycemia in asymptomatic late-preterm and term infants born to mothers with diabetes, as well as newborns who are small or large for gestational age.
American Academy of Pediatrics (AAP), Subcommittee on Hyperbilirubinemia	2004: "Clinical Practice Guideline: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks' of Gestation" 2009: Maisels et al.: "Hyperbilirubinemia in the Newborn Infant 35 or More Weeks' Gestation"	Guidelines for phototherapy and exchange transfusion and stratification of infants 35 or more weeks' gestation as being at low, medium, or higher risk to develop significant hyperbilirubinemia. Algorithm of recommendations for management and follow-up according to predischarge transcutaneous or serum bilirubin levels, gestation, and risk factors for hyperbilirubinemia.
American Academy of Pediatrics (AAP), Task Force on Sudden Infant Death Syndrome (SIDS)	2011: "SIDS and Other Sleep Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleep Environment"	Recommendations for safe sleep, such as supine rather than prone sleeping, no bed sleeping with parents or siblings, and no soft bedding, toys, or blankets.
Anand and International Evidence-Based Group for Neonatal Pain	2001: "Consensus Statement For the Prevention and Management of Pain in the Newborn"	Evidence-based guidelines for prevention, assessment, and management of neonatal pain regardless of gestational age or severity of illness.
AWHONN statement endorsed by American Academy of Family Physicians, American Academy of Pediatrics, American College of Nurse–Midwives, American College of Obstetricians and Gynecologists, and Society for Maternal–Fetal Medicine	2012: "Quality Patient Care in Labor and Delivery: A Call to Action"	Call to action for all who provide perinatal care to optimize maternal health outcomes through effective communication, shared decision making, teamwork, and data-driven quality improvement initiatives.

Organization	Standards	Description
Academy of Breastfeeding Medicine	2010: "Protocol #23: Non-pharmacologic Management of Procedure-Related Pain in the Breastfeeding Infant"	Recommendations about the use of breastfeeding and other nonpharmacologic interventions for procedural pain in the breastfeeding infant.
Centers for Disease Control and Prevention (CDC)	2010: "Prevention of Perinatal Group B Streptococcal (GBS) Disease Among Newborns" (revised guidelines from CDC, 2010)	Algorithm for secondary prevention of early-onset group B streptococcal (GBS) disease in newborn infants.
Engle, Tomashek, Wallman, and Committee on Fetus and Newborn of the American Academy of Pediatrics	2007: "'Late-Preterm' Infants: A Population at Risk"	18 discharge criteria for the late-preterm infant.

- Are prepared by a qualified committee through the collaboration of nurses, midwives, and physicians who practice in the area
- Reflect evidence-based care from the professional literature
- Are archived by the institution for the length of liability
- Are accessible and familiar to the staff

Institutional policies, procedures, and protocols *are* the standard of care for an institution, and their existence creates a presumption that the policies, procedures, guidelines, and protocols of the institution *will be* followed.

Scope of Practice The scope of practice for nurses and midwives is defined by professional nursing and midwifery organizations, regulatory agencies, and legislative bodies (Enzman Hines, 2012). Scope of practice addresses the "who, what, where, why and how of nursing practice" (ANA, 2015b). The depth and breadth of practice (in nurses and midwives with experience ranging from newly graduated to advanced practice) depends on the practitioner's education, experience, roles, and population(s) served (ANA, 2015b).

The scope of professional nursing practice encompasses three functions or actions, as outlined in **Table 1-3**. Independent nursing functions, such as the provision of a safe physical environment, apply to patient care in acute- and chronic-care settings, in clinics, in birth centers, and at home. Collaboratively written practice protocols and guidelines are examples

Table 1-3: Scope of Professional Nursing Practice

Functions/Actions	Definitions
Independent	Aspects of nursing practice contained in state nurse practice acts that require no supervision or direction. Formulation of nursing diagnoses and application of the nursing process are independent nursing functions required by statute of the licensed professional nurse.
Interdependent	Aspects of nursing practice performed in collaboration with other healthcare professionals. Collaboratively written institutional protocols delineate the conditions and treatments the nurse is permitted to administer.
Dependent	Aspects of nursing practice dependent on the written order of another professional. The advanced practice nurse or physician prescribes medications; the nurse administers the prescribed medication. The nurse is also responsible for independent actions: (1) knowing the proper medication, dosage, and route; (2) safe administration; (3) monitoring effects and adverse responses; and (4) advocating for the patient regarding proper administration, dosage, and route.

Reproduced from Meissner-Cutler, S., & Gardner S., L. (1997). Maternal–child nursing and the law. In S. L. Gardner & M. Enzman Hagedorn (Eds.), *Legal aspects of maternal–child nursing practice*. Menlo Park, CA: Addison-Wesley. ©1997. Reprinted by permission of Pearson Education, Inc., New York, New York.

of documents specifying interdependent nursing functions. Practice protocols and guidelines should be periodically reviewed, revised, and updated according to the schedules of accrediting or licensing agencies (such as The Joint Commission, the Commission for the Accreditation of Birth Centers, or the State Board of Nursing) (Enzman Hines, 2012). Dependent functions require the order of another professional, but also necessitate that the nurse or midwife carries out orders within her or his scope of practice, carries out orders safely and properly using independent knowledge, and uses competence to advocate for and protect patients (Meissner-Cutler & Gardner, 1997).

Professional Medical Practice

Physicians and physician assistants are required to provide their patients with the standard of care and to adhere to the standards of practice of their professions as promulgated by their professional organization(s) and defined by their state practice acts. In addition, their scope of practice is defined by their professional organizations, regulatory agencies, and legislative bodies. Medical practice and the standards of medical practice are beyond the scope of this text; instead, readers are referred to their professional organizations and the medical practice acts of the states in which they work.

Evidence-Based Practice

Evidence-based practice (EBP) requires integration of the best and highest-quality research evidence with clinical expertise and each patient's unique values and circumstances (Pantoja & Enzman Hines, 2016; Straus, Glasziou, Richardson, & Haynes, 2011). All too often, clinicians fail to use evidence in an optimal manner—that is, evidence-based therapies may be underused, overused, or misused, or system failures occur (Pantoja & Enzman Hines, 2016). Best care for patients, however, demands true EBP.

All research is not equal. Quantitative clinical research to evaluate the safety and efficacy of therapies has been divided by Sinclair and Bracken (1992) into four levels:

- Highest level: Randomized controlled trials (RCTs)
- Nonrandomized studies with concurrent controls
- Nonrandomized studies with historical controls
- Lowest level: Single case or case series reports without controls

From an international collaboration, the GRADE system was developed for grading evidence and the strength of recommendations. GRADE classifies evidence into one of four levels—high, moderate, low, or very low—with the strength of the evidence rated as strong or weak (**Table 1-4**). Values, preferences, economic implications, and desirable and undesirable effects are factors that influence the strength of the recommendations within this

Table 1-4: Levels of Evidence

Level of Evidence	Therapy/Prevention/Etiology/Harm
1a	Systematic reviews
1b	Individual RCT with narrow confidence intervals
1c	All or none
2a	Systematic review of cohort studies
2b	Individual cohort study (including low-quality RCT [less than 80% follow-up])
3a	Systematic review of case-control study
3b	Individual case-control
4	Case-controlled studies
5	Expert opinion without critical appraisal

Abbreviation: RCT, randomized controlled trial.

Reproduced from Straus, S. E., Glasziou, P., Richardson, W. S., & Haynes, R. B. (2011). Evidence-based medicine: How to practice and teach it (4th ed.). London, UK: Harcourt. Copyright Harcourt Publishers 2011. Reprinted by permission of Elsevier.

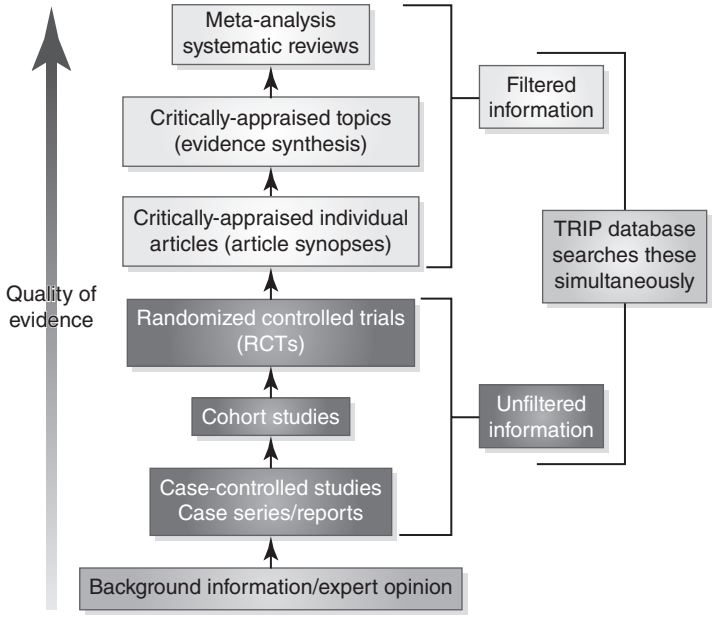

Figure 1-1: Evidence appraisal.
Data from Pantoja, A. F., & Enzman Hines, M. (2016). Evidence-based clinical practice. In S. L. Gardner, B. S. Carter, M. Enzman Hines, & J. A. Hernandez (Eds.), *Merenstein and Gardner's handbook of neonatal intensive care* (8th ed., pp. 1–10). St. Louis, MO: Mosby-Elsevier.

system (**Figure 1-1**). RCTs, for example, test hypotheses by randomly assigning treatment and control groups of adequate size to examine the safety and efficacy of new therapies. A meta-analysis is a systematic review of the highest-quality research (generally RCTs) from the current literature that uses statistical methods to combine the results of individual studies and summarize the results (e.g., Cochrane Neonatal Review Group, http://neonatal.cochrane.org).

Qualitative research facilitates an understanding of the lived experiences and values of patients being studied. It guides decision making as to whether the findings of quantitative research are replicable in other, different populations (Pantoja & Enzman Hines, 2016).

Legal Issues

Statute of Limitations

All states have legislation defining a specific time frame in which a person who is injured or harmed due to professional negligence may file a lawsuit. This time limit for filing a lawsuit is called the statute of limitations. The statute of limitation varies by state but generally ranges from 2 to 7 years from the date of the negligence resulting in injury or harm

(Meissner-Cutler & Gardner, 1997). In the case of a minor (most often defined as a child younger than the age of 18 years), however, the term of the statute of limitations may not begin to run until the child reaches the age of majority (i.e., 18 to 21 years depending on state law). Therefore all providers caring for minors have a protracted period of liability.

Not only does the term of the statute of limitations vary by state, but the application differs by state. The time period for the statute may be designated as beginning to run from any one of the following:

- The date of the act causing the injury (*Olsen v. St. Croix Valley Memorial Hospital*, 1972)
- The date of last treatment by the particular care provider
- The "date of the discovery" of the injury (*Teeters v. Currey*, 1974)

The date of discovery is the date that the patient knew or should have known of the injury (*Renslow v. Mennonite Hospital*, 1977). The following maternal–child nursing example illustrates the possibility of delay in knowing of the injury one has suffered from professional negligence.

Suppose a nurse caring for a postpartum woman fails to administer an ordered RhoGAM injection to an Rh-negative patient who delivered an Rh-positive baby, or a midwife caring for a postpartum woman fails to order a RhoGAM injection for an Rh-negative patient who delivered an Rh-positive baby. Four years later, this same woman becomes pregnant. Because of the prior development of antibodies, her new Rh-positive fetus is affected, causing injury to the child's brain, nervous system, and other organs. Even though more than 2 years has passed since the failure to order or administer RhoGAM, the woman did not and reasonably would not have learned of the omission until she again became pregnant and delivered a sensitized Rh-positive newborn. In this case, the 2-year discovery rule stipulates that the term of the statute of limitations commences at the time the patient knew or should have known of the failure to receive RhoGAM—that is, when she delivered her second child (Meissner-Cutler & Gardner, 1997).

Professional Negligence

Professional negligence, or malpractice, occurs when a provider, regardless of type, who is caring for mothers and their newborns fails to possess the same or similar skill and knowledge that is customary in other providers in the same or similar circumstances. Professional negligence occurs when there is a lack of "ordinary" or "reasonable" care, which results in injury/harm to a patient. Any professional caring for a newborn can be found liable of negligence when there is a failure (1) to possess the requisite skill and knowledge, (2) to exercise reasonable care, or (3) to use best judgment (Meissner-Cutler & Gardner 1997). A professional must not only possess the requisite skill and knowledge, but also use best judgment in exercising that skill and applying that knowledge (*Pike v. Honsinger,* 1898). A practitioner may be liable for (1) not knowing what to

do when a reasonably prudent practitioner would have known what to do; (2) knowing what to do, but not doing it; or (3) knowing what to do but doing it carelessly.

Professional negligence is proved by establishing that the caregiver met four criteria:

- Had a duty to the patient
- Breached the duty to the patient
- Injured or harmed the patient
- The breach of duty caused the injury/harm

All care providers are professionally accountable for their practice, which is premised on the concept of duty—an obligation to another to comply with particular standards of conduct. According to the *Code of Ethics for Nurses* (ANA, 2015a), nurses are duty-bound to themselves, their patients and the public, their employer, and the nursing profession.

All providers are expected to perceive a patient's needs and risks to a degree that the average layperson would not perceive them. Providers are expected to exercise reasonable care to avoid conduct that can foreseeably cause injury to the patient. As an example, the legal precedent for the nurse's duty to the patient was determined in *Darling v. Charleston Community Memorial Hospital* (1966); in this ruling, such duty was defined to include affirmative action, notification of the chain-of-command, advocacy, and disclosure. A breach of duty to the patient can result in liability for any subsequent harm resulting from that breach (Meissner-Cutler & Gardner, 1997).

Care providers owe a duty to their employer to practice within the standards set forth in the institution's policies, procedures, guidelines, and protocols. When a provider fails to perform the duty to an employer, the institution can be held liable for acts of omission or commission of the employee that injured or harmed a patient. An institution can also be held independently negligent under the doctrine of corporate liability. A birth center or hospital has a responsibility to patients to screen, select, educate, and retain only qualified and competent staff (*Bleiler v. Bodnar*, 1985; *Darling v. Charleston Community Memorial Hospital,* 1966). A birth center or hospital also has a responsibility to have and enforce written, relevant, current, evidence-based policies, procedures, and protocols as the standard of care for that institution.

Before a caregiver can be found liable of professional negligence, the patient's attorney must prove that the negligent act (commission) or failure to act (omission) actually caused the patient injury or harm. A professional cannot be held responsible for a patient's injury or harm if the damages were not sustained as a result of the act of negligence forming the basis for the claim (Meissner-Cutler & Gardner 1997). Causation of the injury or harm must be established to a reasonable degree of medical probability (defined as more than 50%) by an expert witness who is competent and qualified to render such opinion.

Although professional negligence is generally not a crime, acts of negligence that are wanton or done with malice may be considered criminal. In particular, gross negligence—an

aggravated form of negligence "usually accompanied by a conscious indifference to the consequences" or with reckless disregard for the rights and safety of others—can be a crime (Prosser, 1984, p. 213). Generally, for an individual to be convicted of a crime, it must be proved that the person had a state of mind and intent to do harm, as well as criminal conduct.

Professional Practice and Care of the Neonate

Professional practice related to care of the newborn or neonate is defined by the professional associations using the best evidence for optimal outcomes. The American College of Nurse–Midwives defines the components of midwifery care of the newborn. The midwife independently manages the care of the newborn immediately after birth and continues to provide care to well newborns up to 28 days of life using consultation, collaboration, and/or referral to appropriate healthcare services as indicated. The National Organization of Nurse Practitioner Faculty (NONPF, 2014) identifies core competencies for neonatal nurse practitioners, pediatric nurse practitioners, and family nurse practitioners. The competencies recognize the independent practice of NPs in caring for newborns. The AAP has identified guidelines for hospital care of late-preterm and term newborns and includes criteria for early discharge (Benitz & AAP, Committee on Fetus and Newborn, 2015; Engle, Tomashek, Wallman, & AAP, Committee on Fetus and Newborn, 2007). These guidelines apply to nurse practitioners, certified nurse–midwives, certified midwives, certified professional midwives, and all providers of care to newborns. Medical care providers, including medical students, residents, and physician assistants, must be familiar with their own practice requirements.

An example of how evidence influences practice can be seen in the recent changes in care of the late-preterm infant. The "epidemic" of births before 39 weeks' gestation prompted professional and public education on the importance of maintaining pregnancy to term and the increased morbidities and mortalities experienced by late-preterm infants. In keeping with this campaign, beginning in 2011, one of the five perinatal core measures for The Joint Commission (TJC, 2011) became reduction of elective deliveries prior to the 39th week of pregnancy.

Because of their anatomic and physiologic differences and the developmental immaturity (Table 1-1) of even healthy full-term infants, quick action and a high index of suspicion are necessary to provide safe, efficacious care to these babies. Even early term newborns with a gestational age of 37 to 38 weeks have been found to be 120 times more likely to require ventilator support for surfactant deficiency (the physiologic cause of respiratory distress syndrome, a condition of the immature lung) than newborns of 39 to 41 weeks' gestation (Madar, Richmond, & Hey, 1999). The risks of iatrogenic respiratory distress syndrome are greatly reduced if delivery occurs at 39 weeks' gestation (Minkoff & Chervenak, 2003; Morrison, Rennie, & Milton, 1995; Zanardo et al., 2004). Research has consistently associated increased respiratory morbidity with delivery (including elective cesarean section) prior to

39 weeks' gestation (Barrington, Vallerand, & Usher, 2004; Boyle et al., 2015; Chioukh et al., 2014; Clark, 2005; Escobar, Clark, & Greene, 2006; Hansen, Wisborg, Uldbierg, & Henriksen, 2007; Haroon, Ali, Ahmed, & Maheen, 2014; Horgan, 2015; Kashu, Narayanan, Bhargava, & Osiovich, 2009; Mahoney & Jain, 2013; Mally, Hendricks-Munoz, & Bailey, 2013; Morrison et al., 1995; Rubaltelli, Bonafe, Tangucci, Spagnolo, & Dani, 1998; Tita et al., 2009: Van Den Berg, Van Elburg, Van Geijn, & Fetter, 2001; Zanardo et al., 2004). The mortality rate for infants born at 37 to 38 weeks' gestation is 3.01 deaths per 100,000 births—63% higher than the rate for full-term infants (Mathews, MacDorman, & Thoma, 2015).

This text is written for students and clinicians (i.e., certified nurse–midwives, certified midwives, certified professional midwives, nurse practitioners, physician assistants, medical students/residents, and family practice physicians) who care for late-preterm and term newborn infants at birth and through the neonatal period (i.e., the first 28 days of life). Each chapter contains the latest evidence-based practice as well as published standards of care, position statements, guidelines, and recommendations for care of the well newborn.

Conclusion

Normal newborns are unique in their anatomy and physiology. Because of their uniqueness, the standards of care focus on the needs for the transition from birth through the first 28 days of life. The neonatal care provider must keep abreast of the practices that are specific to these unique humans. This text provides content for provision of care that meets the standards of professional associations, reflects national guidelines, and represents current evidence-based practice.

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