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THE JOURNAL OF Legal Nurse Consulting

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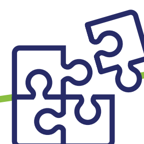

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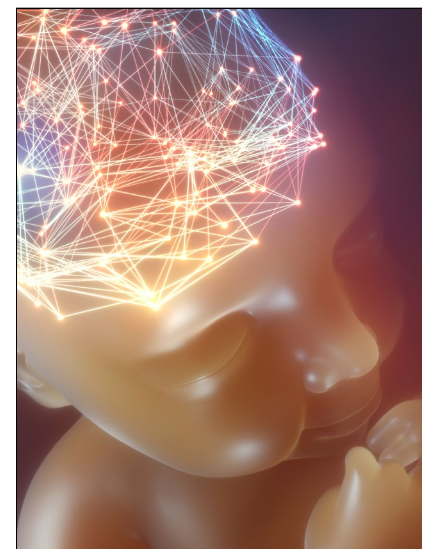

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The purpose of the *Journal* is to promote legal nurse consulting within the medicallegal community; to provide novice and experienced legal nurse consultants (LNCs) with a quality professional publication; and to teach and inform LNCs about clinical practice, current legal issues, and professional development.

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The *Journal* accepts original articles, case studies, letters, and research. Query letters are welcomed but not required. Material must be original and never published before. A manuscript should be submitted with the understanding that it is not being sent to any other journal simultaneously. Manuscripts should be addressed to JLNC@aalnc.org. Please see the next page for Information for Authors before submitting.

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We send all submissions blinded to peer reviewers and return their blinded suggestions to the author. The final version may have minor editing for form and authors will have final approval before publication. Acceptance is based on the quality of the material and its importance to the audience.

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The Journal of Legal Nurse Consulting (JLNC), a peer reviewed publication, is the official journal of the American Association of Legal Nurse Consultants (AALNC). We invite interested nurses and allied professionals to submit article queries or manuscripts that educate and inform our readership about current practice methods, professional development, and the promotion of legal nurse consulting within the medical-legal community. Manuscript submissions are peer-reviewed by professional LNCs with diverse professional backgrounds. The *JLNC* follows the ethical guidelines of COPE, the Committee on Publication Ethics, which may be reviewed at: http://publicationethics.org/resources/code-conduct.

We particularly encourage first-time authors to submit manuscripts. The editor will provide writing and conceptual assistance as needed. Please follow this checklist for articles submitted for consideration.

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- Place author name, contact information, and article title on a separate title page, so author name can be blinded for peer review
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Lisa Mancuso,
BSN, RN, CCRN, CLCP, LNCC

President, AALNC

President's Update

Dear members and readers,

Last year I became interested in gardening, specifically with creating a pollinator garden in our backyard. I spent hours researching native plants, soil, the types of pollinators the plants would attract, placement of plants in the garden and which plants birds in my area would enjoy.

I spent yesterday in that garden plot, totally overwhelmed by the weeds. (Of course, part of the problem is that I am reluctant to dig anything up in case a "weed" is actually a beneficial "volunteer" plant for my garden!)

As I pulled weeds (I can absolutely identify crab grass, and it's VERY satisfying when the entire root comes out). I started to think about the life metaphor this presented. Just as weeds choke out the desirable plants, I have "weeds" in my life that choke out my joy. (Thank you, pollen on my windowsills. Thank you, long lines at the grocery store checkout.)

I've noticed this in my LNC business as well. I really enjoy what I do in my independent practice, but I don't always have joyful days. I have struggled with this in recent months. What was choking me?

Yesterday while I was pulling actual weeds, I prepared a mental list of symbolic weeds. My symbolic weeds are things like calls or emails from vendors trying to sell me something, the potential client who has only retained me for one case but thinks nothing of calling me to "pick my brain" over and over again, alerts on my email that distract me from my work, and a family member who doesn't respect that working from home is still working.

Just like a garden needs borders, we must set up boundaries around our work life. Today I started pulling my virtual weeds: I silenced the alerts on my email program, I turned on the "do not disturb" function on my cell phone, and I flagged certain emails as spam. I had one of the most productive days I've had in several months.

Guess what? Nothing fell apart today! I answered all emails at 4 p.m., I returned voice mails after that, and now I'm going to read my LinkedIn notifications. I have to say, I feel happy and accomplished (which was my goal when I left my clinical job).

What weeds will you be pulling? Maybe we should start collecting our thoughts for a future *JLNC* article?

Lisa A. Mancuso

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Just like a garden needs borders, we must set up boundaries around our work life.

Editor's Note

Martha R. Kelso,
RN, HBOT

Editor, JLNC

Dear readers and colleagues,

Admittedly, fall is one of my favorite times of the year. The trees changing colors in the Midwest are extraordinary to witness along a winding highway or corridor. The smell of backyard firepits and roasting hotdogs or marshmallows while relaxing with friends and family blanketed overhead by stars and the moon are some of my most cherished moments. Going to pumpkin patches with the kids and riding on a hayrack while looking for the most perfect pumpkin. Preparing spiced apple cider to go with your pumpkin or pecan pie envisions the colors of orange, yellow, brown, and red in the kitchen and on your plate. Thanksgiving is right around the corner. I find fall relaxing because of the activities, but also peaceful in terms of weather, for the most part.

Fall weather is when I find LNC work the most peaceful, too. Performing expert witness work outside in a screened-in porch (because I'm not friends with bugs) while watching the fireflies or hearing the cicadas is relaxing and rewarding. Many LNCs work during the day and relax in the evenings, but part of being an LNC if you have your own practice is determining when and where you work. It's the freedom of flexibility and type of work performed along with the complexity of the cases that I enjoy so much.

Aside from the work, I enjoy networking with other LNCs. I love hearing about their careers and practices. There are so many specialty LNC areas of practice that it is mind-boggling. I recently had the opportunity to coach (push) two fellow colleagues into the world and work of LNC. For those of you just getting started, I highly recommend taking a course for certification. Even if you don't sit for the certification, the amount of information you learn about LNC work is beyond valuable. The content goes beyond case law or examples, but also covers report writing, how to be deposed, what content to include in your curriculum vitae, and even content on how to market yourself (if needed). The tips and tools from these courses are usually tax deductible (check with your accountant first) and will pay you back in spades.

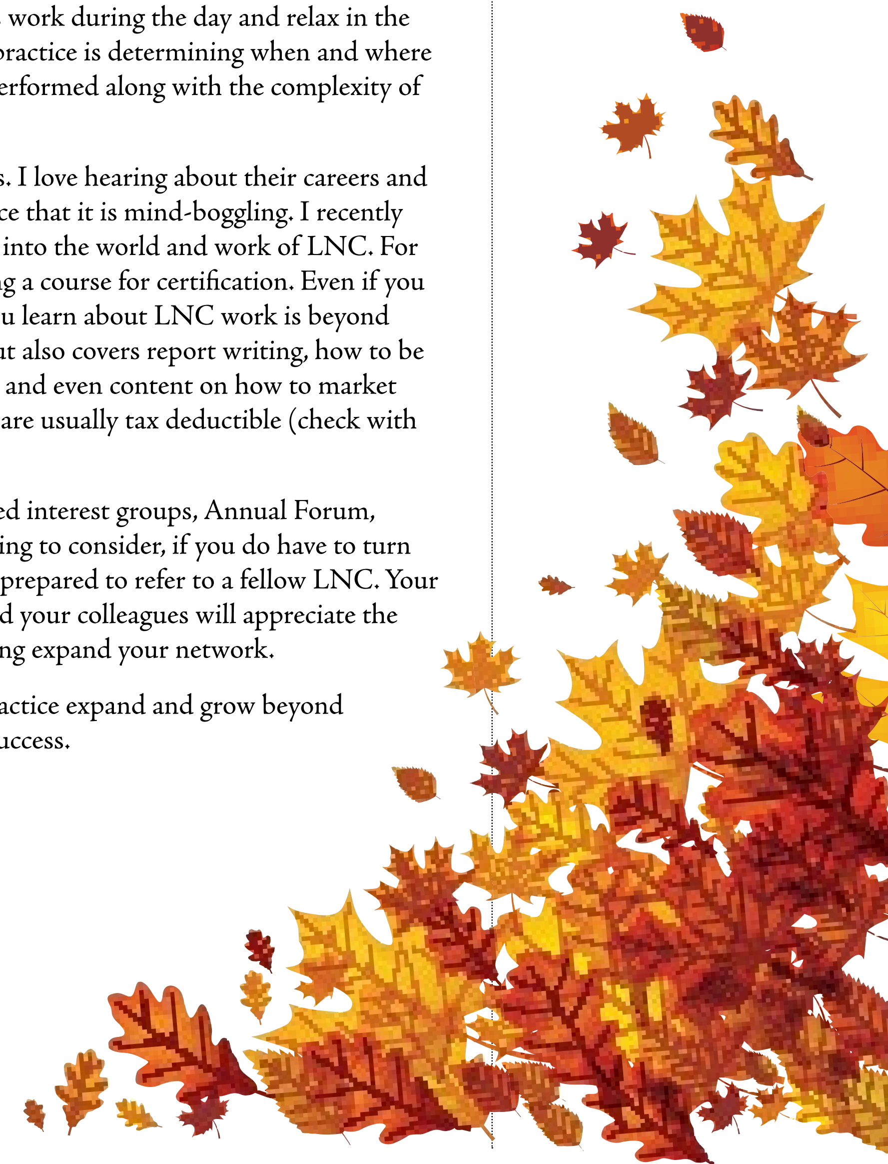
Other ways to network are of course on social media, shared interest groups, Annual Forum, webinars, local chapters, and word of mouth. One more thing to consider, if you do have to turn down a case due to time constraints or conflicts, always be prepared to refer to a fellow LNC. Your clients will appreciate the referral to someone you trust, and your colleagues will appreciate the business and likely send referrals back as appropriate helping expand your network.

Enjoy the fall in the upcoming months. May your LNC practice expand and grow beyond your wildest dreams. The AALNC is committed to your success.

Sincerely,

Martha R Kelso

Martha R. Kelso, RN, HBOT



Hypoxic Ischemic Encephalopathy:

Pearls for the LNC

Joan Earley, MSN, RNC-NIC, C-ELBW, CPNP, CLCP

Keywords: hypoxic-ischemic encephalopathy, Sarnat Staging, neurologic syndrome, neuroprotective, hypothermia

The legal nurse consultant (LNC) who assists attorneys with hypoxic-ischemic encephalopathy cases must have a toolbox to assist attorney clients. The LNC must know how to decipher medical records to determine risk factors, prognosis, and the timing of neurologic insults impacting the neonate with HIE. Pearls the LNC can use to understand the medicolegal aspects of this condition are provided.

Hypoxic-ischemic encephalopathy (HIE) is a devastating birth injury. HIE is a brain injury caused by asphyxia that prevents adequate blood supply from circulating to the brains of primarily term infants. Hypoxic events can occur during the prenatal, intrapartum, or postnatal period (Allen & Brandon, 2011).

The incidence of HIE is 1.5-2.5 per 1000 live births. Nearly 2-4 % of term babies are affected by HIE. Low birth weight neonates have an increased incidence of 60% (Association of Women's Health, Obstetric, and Neonatal Nurses [AWHONN] et al., 2015). According to Volpe, 20% of cases of HIE occur in the antepartum period, and 30% in the intrapartum period (Inder & Volpe, 2018). HIE causes 21% to 23% of neonatal deaths and 6-9% of neonatal deaths in term babies (Finder et al., 2020) (Zanelli et al., 2018). Worldwide, 1 million deaths per year are attributed to HIE. Even though this statement may be controversial, many experts consider HIE a significant cause of cerebral palsy (CP) (Inder & Volpe, 2018).

HIE can negatively impact the quality of life of neonates and their families. Even children mildly affected can have long-term problems such as developmental delay. Children with severe asphyxia may be at risk for aspiration pneumonia and require feeding tubes. They may need respiratory support and frequent suctioning. Long-term follow-up may be necessary for orthopedic issues such as scoliosis, dislocated hips, and visual deficits. They may require communication devices, follow-up with speech therapists, surgery for scoliosis, physical therapy, orthotics, and baclofen pumps for spasticity if needed. They require special wheelchairs and adaptive home devices. They also require appropriate education plans. This list is not inclusive. Parents and the child's caretakers require respite care for much-needed mental and physical rest. Caretakers often must stop working to care for their affected child. The family experiences a loss of income. The family also mourns the loss of educational opportunity and future income for their affected child (Eunson, 2015).

It is estimated that the long-term financial needs of children with HIE and subsequent cerebral palsy may be over 900,000 dollars for those with comorbid cognitive difficulties (Husted, 2015). The LNC and life care planner (LCP) can assist the plaintiff or defense attorneys in determining the future needs of newborns affected by HIE. The LCP can consult with the physical medicine and rehabilitation (PM&R) physician, neurologist, physical therapist, family, and later the neuropsychologist, for example, to determine the future needs of affected children. The LNC must become familiar with the antecedents of HIE to assist attorneys with brain injury cases. A discussion of the causes of HIE follows.

This activity is designed to increase knowledge of the LNC in assisting attorneys with hypoxic-ischemic encephalopathy cases. The LNC must know how to decipher medical records to determine risk factors, prognosis, and the timing of neurologic insults impacting the neonate with hypoxic-ischemic encephalopathy.

Upon completion of the learning activity the learner will be able to:

a. Identify incidence and antepartum risk factors for hypoxemic-ischemic encephalopathy in neonates.
b. Recognize and determine prognosis and the timing of neurologic insults through medical record review.
c. Identify the medicolegal aspects of hypoxemic-ischemic encephalopathy and better assist plaintiff and defense attorneys with these cases.

The author, reviewers, and nurse planners all report no financial relationships that would pose a conflict of interest.

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Events associated with HIE include cord prolapse, uterine rupture, abruption placenta, placenta previa, maternal hypotension, breech presentation, or shoulder dystocia. Abnormal fetal heart rate tracings, poor umbilical cord gases, low Apgar scores, meconium-stained fluid, and the neonate's need for respiratory support during the first few minutes of life are associated with HIE. Conditions related to impaired oxygen delivery and decreased cerebral blood flow can lead to HIE. An important caveat is that there are other causes of neonatal encephalopathies, such as infections and metabolic disorders (Reynolds & Talmage, 2011).

HIE occurs in two phases: primary energy failure and secondary energy failure. As previously discussed, the preliminary failure phase of HIE starts with a reduction in cerebral blood flow initiated by a triggering event (Allen & Brandon, 2011). Oxygen is decreased in the primary energy failure stage. Lactic acid levels increase during anaerobic metabolism (Reynolds & Talmage, 2011). Also, decreased cerebral blood flow leads to less adenosine triphosphate (ATP) energy production. Low levels of ATP disrupt mechanisms that maintain cellular integrity, such as the sodium/potassium pump (Allen & Brandon, 2011).

An excessive increase in positively charged sodium ions results in the depolarization of the baby's brain neurons. Glutamate, an excitatory neurotransmitter, is released during this process. Glutamate binds to glutamate receptors resulting in increased intracellular calcium and sodium. The increased intracellular calcium and sodium cause cellular edema, ischemia, necrosis, and cell death (apoptosis). Cellular necrosis disrupts the cell membrane.

Necrosis causes brain cells to swell and rupture, leading to cell death in the primary energy phase of HIE. When cells rupture, released contents cause inflammation. Inflammatory mediators damage white cell matter. This leads to scar formation. The brain cells may die or recover if there are fewer severe

insults. Cell death leads to cell shrinkage. Apoptosis can occur several days after the initial injury. Necrosis causes decreased brain function.

If the damage during the primary energy failure phase is severe, further injury occurs in the secondary energy phase. There is a period of recovery if blood flow is restored. This brief recovery period is called the latent period. During this period, vital signs may be normal. The severity of the ischemic damage can determine if the recovery period is brief or lasts longer. The latent period is the best time for treatment. The latent period can last 6 hours.

The secondary energy failure phase may occur 6-48 hours after the initial insult. Inflammation, excitotoxicity, and oxidative stress contribute to secondary energy failure. Free radical production causes oxidative stress with necrosis and cell death.

Neonates use high levels of oxygen while transitioning from fetal life. The fetal brain has decreased levels of antioxidants and is ill-equipped to eliminate free radicals produced during a hypoxic-ischemic event. Neuronal tissue is damaged as a result.

Increased levels of the neurotransmitter glutamate cause a cascade of events, such as the excess flow of calcium and sodium into neural cells. Glutamate in normal levels is an important neurotransmitter for hearing, vision, learning, memory, and somatosensory function. Disrupted neurotransmission impairs the development of the neonatal brain (Allen & Brandon, 2011).

Volpe states three events occur as HIE develops (Inder & Volpe, 2018, p. 512). These events comprise neurological syndrome. They include:

1. Evidence of fetal distress and fetal risk for hypoxia/ischemia, FHR abnormalities, sentinel event, fetal acidemia
2. The need for resuscitation and low Apgar scores
3. An overt neurological syndrome in the first hours or days of life

Sarnat developed a system for the classification of HIE from Stage 1 (mild), Stage 2 (moderate), to Stage 3 (severe) in the 1970s. See the table below (Casey et al., 2011):

1. Stage 1 clinical presentations of HIE, according to Sarnat, include hyper-responsiveness to stimulation, increased deep tendon reflexes, few oral secretions, and usually no seizures. Seizures may also occur if there are preexisting conditions such as hypoglycemia (AWHONN et al., 2015, p. 762).
2. Stage II of Sarnat classification (moderate encephalopathy) includes an overactive doll's eye reflex, increased DTRs, (deep tendon reflexes), periodic respiration, lethargy, strong grasp, and myoclonus. Stage II is a critical phase because the infant can improve or deteriorate. EEG abnormalities, seizures, cerebral edema, and lethargy are signs of deterioration. Signs of improvement in Stage II are cessation of seizure activity, normal EEG, and an increase in the level of consciousness.
3. Stage III (severe encephalopathy) Sarnat classification clinical signs and symptoms include apnea and bradycardia, requiring ventilator support, and decreased level of consciousness. Seizures occur within the first 6-12 hours after birth. Seizure activity may be subtle or generalized in premature neonates and multifocal clonic in the term baby. Term babies may be subtle or generalized in premature neonates and multifocal clonic in the term baby. Term babies may also exhibit subtle seizure signs such as staring or twitching of the tongue. Deep tendon reflexes are decreased or absent in Stage III Sarnat classification. These infants can deteriorate in 24-72 hours. Those who survive have feeding difficulties. They are unable to suck and swallow. These hypotonic infants have poor neurologic outcomes.

Sarnat & Sarnat Staging (1976)

	Stage 1	Stage 2	Stage 3
Consciousness	hyperalert	Lethragic of obtunded	Stupor or coma
Activity	Normal	Decreased	Absent
Neuromuscular control Muscle tone Posture Stretch reflexes	Normal Mild distal flexion Overactive	Mild hypotonia Strong distal flexion Overactive	Flaccid Intermittent decerebration Decreased or absent
Primitive Reflexes Suck Moro Tonic Neck	Weak Strong Slight	Weak or absent Weak, incomplete Strong	Absent Absent Absent
Autonomic function Pupils Heart rate	Normal Tachycardia	Miosis Bradycardia	Mydriase or variable, unequal Variable
Seizures	None	Common	Uncommon

The legal nurse consultant who assists attorneys with HIE cases must examine the medical records for possible risk factors contributing to brain injury; antepartum risk factors (occurring before birth) may include the following test results:

FETAL MOVEMENT

Maternal reports of decreased fetal or decreased movement noted on ultrasound may indicate "chronic uteroplacental insufficiency." The mother's self-report of fetal movement is a standard method of determining "fetal well-being" (Inder & Volpe, 2018, p. 326).

FETAL HEART RATE

The non-stress test is used to assess fetal response to movement. The fetus should demonstrate at least two heart rate accelerations (of at least 15 beats per minute) above the baseline heart rate for at least 15 seconds; as a response to movement or vibro-acoustical stimulation in 20 minutes. If this occurs, this is considered a reactive non-stress test and is predictive of fetal well-being. A caveat is that the 24–28-week-old fetus may have a non-reactive stress test and be neurologically intact (Inder & Volpe, 2018).

CONTRACTION STRESS TEST

This test consists of the fetal heart rate response to oxytocin or nipple stimulation. Oxytocin and nipple stimulation can cause contractions. Late decelerations as a response after 50% or more of contractions are indicative of an abnormal contraction stress test. Late decelerations indicate fetal distress as a response to contractions. Uterine contractions may produce variable decelerations as well. The variable deceleration fetal heart rate tracing indicates umbilical cord compressions during contractions. Sometimes the variable deceleration fetal heart rate pattern indicates oligohydramnios (decreased amniotic fluid) (Inder & Volpe, 2018).

FETAL BIOPHYSICAL PROFILE

The five components of the biophysical profile include fetal breathing, movement, tone, heart rate reactivity, and amniotic fluid volume. Each piece, if present, is given a score of 2 points. A score of 8-10 is considered normal. A score of 6 is equivocal, and a score of 4 or less is abnormal. Oligohydramnios (decreased amniotic fluid warrants further investigation of the fetal biophysical profile (Inder & Volpe, 2018).

FETAL GROWTH

Ultrasound detection of intrauterine growth retardation is an important finding. Ten to 15% of growth retarded neonates are at risk for intrapartum asphyxia caused by placental insufficiency (Inder & Volpe, 2018).

UMBILICAL ARTERY DOPPLER VELOCITY

Doppler ultrasound detects decreased umbilical artery diastolic flow velocity in intrauterine growth-restricted neonates (IUGR). The absence of diastolic flow leads can lead to fetal demise and asphyxia (Inder & Volpe, 2018).

The legal nurse consultant who assists with HIE cases should examine the medical record (history)for antepartum risk factors that can lead to decreased placental blood flow and HIE in the newborn. These risk factors include (Inder & Volpe, 2018, p. 449):

- Preeclampsia
- Maternal diabetes
- Intrauterine growth restriction
- Twin gestation
- Maternal trauma/hemorrhage
- Post dates
- Maternal thyroid disease
- Maternal age

TORCH infections: (congenital infections passed to the baby during pregnancy, delivery, or after birth) TORCH is an acronym for toxoplasmosis, other (syphilis, varicella, mumps, parvovirus, and HIV; rubella, cytomegalovirus, and herpes simplex.

Intrapartum risk factors for HIE that may be noted in the labor and delivery medical records include:

- Chorioamnionitis
- Uterine rupture
- Abruption placenta
- Cord prolapse
- Placenta previa
- Placental vasculopathy
- Thick meconium
- Fetal heart rate abnormalities
- Fetal acidemia
- Resuscitation needed by the neonate and Apgar scores less than 7
- Inadequately trained personnel providing NRP (neonatal resuscitation)
- Shoulder dystocia
- Failed vacuum extraction
- Sentinel events (Torbenson et al., 2017)

As noted earlier, inborn metabolism errors are often mistaken for HIE. The LNC should identify significant factors in the family medical history in the medical records. Inborn errors of metabolism often present after a period of wellness in the neonate. There are usually no initial signs of asphyxia at birth. Mitochondrial disorders cause symptoms similar to neonatal encephalopathy (Aslam et al., 2019).

Inborn errors of metabolism that cause symptoms similar to HIE include sulfite oxidase deficiency, nonketotic hyperglycinemia, cytochrome C, Clara transaminase, 3-phosphoglycerate dehydrogenase, urea cycle defects, peroxisomal disorders, mitochondrial defects, disorders of pyruvate metabolism, and urea cycle defects (Aslam et al., 2019).

Genetic causes of neonatal encephalopathies include congenital myoclonic dystrophy type I and factor V Leiden. Neonatal neuromuscular myopathies also cause neonatal encephalopathy (NE) (Aslam et al., 2019).

Clotting disorders such as V Leiden and prothrombin mutations cause strokes in neonates. Infections also cause NE.

The legal nurse consultant should review the medical records to determine if hypothermia treatment for a neonate with HIE was started within 6 hours of injury.

Thus, there are multifactorial causes of neonatal encephalopathies (Zanelli et al., 2018).

The LNC should note lab results in conjunction with the physical and history may indicate the extent of brain injury. Some laboratory test results to consider are:

Serum electrolytes: Low serum sodium, potassium, and chloride levels along with reduced urine output and increased edema (excessive weight gain) may indicate SIADH (syndrome of inappropriate antidiuretic hormone, acute renal tubular damage, especially in the first 2-3 days of life.

Cardiac enzyme results may indicate heart damage from asphyxia.

Renal function lab results such as serum creatinine, creatinine clearance, and blood urea nitrogen levels (BUN) may indicate renal damage from HIE.

HIE damage affecting liver function can be assessed by following platelet counts, partial thromboplastin time, and fibrinogen labs.

Labs such as fetal cord gases, arterial blood gases, and lactate results should be reviewed to gain information about the extent of neurological insult (Zanelli et al., 2018).

The LNC should also look for imaging study reports in the medical records when assisting with HIE cases. Magnetic Resonance Imaging (MRI) is the preferred imaging study, especially for following infants with moderate to severe HIE. Patterns of injury and prognosis can be identified on MRI (Zanelli et al., 2018).

Plaintiff and defense attorneys will find MRI studies helpful in determining pre-existing brain defects. For example, defects such as inflammatory processes, hydrocephalus, trauma, and congenital malformations can be detected on MRI.

EEG results, hearing screens, and retinal exam reports also provide valuable clues regarding the severity of HIE. Echocardiography results are important to examine because HIE can cause decreased cardiac contractility and ejection fraction. Supportive care was the only treatment available for HIE 10-15 years ago. The supportive care consisted of blood pressure maintenance, prevention of hypoglycemia, seizure medication, and ventilator support (Zanelli et al., 2018).

Since 2010, hypothermia has been recognized as the primary neuroprotective treatment for HIE. A cooling cap or a total body cooling blanket is utilized. The rectal or nasopharyngeal temperature must be maintained at 34-35 degrees centigrade for 72 hours. Hypothermia prevents further inflammation and cell death and must be initiated within 6 hours of birth (Mosalli, 2012).

The legal nurse consultant should review the medical records to determine if hypothermia treatment for a neonate with HIE was started within 6 hours of injury. The legal nurse consultant should also note if transfer to a level III or IV facility offering hypothermia treatment for HIE were done promptly.

Inclusion criteria for therapeutic hypothermia include:

- Infants greater than or equal to 36 weeks gestational age
- Evidence of moderate or severe encephalopathy or seizures
- Evidence of hypoxia contains two of the following
- Apgar score less than or equal to 5 at 10 minutes of age
- The continued need for mechanical ventilation or resuscitation at 10 minutes of age
- Metabolic acidosis with pH less than seven or a base deficit greater than or equal to 12mmol in cord blood or arterial blood gas within 1 hour of birth

Infants not eligible for Cooling include:

- Infants with a birth weight of fewer than 2000 grams
- Infants with gestational age less than 36 weeks
- Infants with life-threatening congenital heart disease
- Infants whose death appears inevitable.

The following case study provides an example of a neonate suffering from HIE.

- The infant may qualify for hypothermia treatment.

Case Study

Baby boy Johnson is a 39-week gestational age infant. His mother is 25 years old. This is her first baby. A stat C-section delivers Mrs. Johnson's baby by the obstetrician for decreased heart tones. He appears limp and blue with poor respiratory effort. The neonatologist is present at delivery and immediately provides positive pressure ventilation. Baby boy Johnson is intubated. His heart rate at one minute of age is 50. Chest compressions are begun. His oxygen saturation by pulse oximeter placed on his right wrist is 40%. He is given 100% oxygen. Resuscitation continues, and baby boy Johnson receives one dose of epinephrine per umbilical venous catheter. His heart rate increases after 5 minutes to 120. The baby's Apgar scores are one at 1 minute of age, three at 5 minutes of age, and three at 7 minutes of age. The cord blood gas pH is 6.78. The baby is prepared for transfer to the neonatal intensive care unit, where he is placed on a ventilator. Baby boy Johnson remains limp and unresponsive. His initial arterial blood gas is pH 7.0, PO2 55 HC03 of 10, and base excess of -16 mmol. The baby is loaded with phenobarbital after seizing at 30 minutes of age. Neurology is consulted and baby boy Johnson's mother is informed of his condition by the neonatologist and neurologist, as well as the plan of care. Mrs. Johnson and her husband sign the consent forms for hypothermia treatment and NICU care. An MRI is ordered by neurology. Baby boy Johnson is prepared for head cooling.

Baby boy Johnson meets the criteria for hypothermia treatment. There was a sentinel event at delivery (loss of fetal heart rate tones). There was a need for resuscitation, evidence of fetal acidemia, and low Apgar scores. Baby Johnson had evidence of asphyxia.

Summary

Neonates affected by HIE have long-term health problems, including blindness, seizures, cerebral palsy, and neurodevelopmental deficits. The LNC must be prepared to assist attorneys by knowing what to look for in the medical records. The LNC must examine the mother's history for antepartum and intrapartum risk factors that may impact the baby. MRI and lab results are tools that determine prognosis and identify preexisting conditions. Also, the LNC must be aware of signs of asphyxia and the three elements of the neurologic syndrome of HIE as noted in the case study:

1. Evidence of fetal distress and fetal risk for hypoxia/ischemia, FHR abnormalities, sentinel event, fetal acidemia
2. The need for resuscitation and low Apgar scores
3. An overt neurological syndrome in the first hours or days of life (Inder & Volpe, 2018)

The LNC can assist defense and plaintiff attorneys by creating life care plans for the future healthcare needs of neonates with HIE and examining neurology consult notes and MRI reports to determine when hypoxic events occurred. The legal nurse consultant with obstetric experience can assist the attorney by reading FHR reports to determine if signs of fetal distress were present in labor and delivery. The pearls previously discussed can assist attorney clients in identifying the timing of HIE neurologic injury (Husted, 2015).

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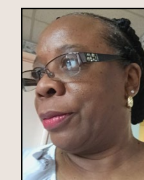

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Fall Risk Prevention:

A Comprehensive Endeavor

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Keywords: falls, CMS, acute care, fall risk assessment, high fall risk, universal fall precautions

Falls are a serious, costly medical problem globally. According to the Centers for Disease Control and Prevention, falls in adults 65 years and older in the United States cost over $50 billion annually. The consequences of falls may include short-term inconveniences and long-term complications. This epidemic has bled into the acute care inpatient world, and the Agency for Healthcare Research and Quality estimates that 700,000 to 1 million hospitalized patients fall annually. With the removal of federal funding for falls in acute care hospitals in 2008, innovations have been made to create fall risk assessments and develop universal and high-risk fall precautions. Research into falls is plentiful and contradictory, leading to various fall risk assessment tools being developed. Despite the tool used, universal fall precautions should be implemented with each patient, with special and individualized precautions for patients deemed to be at high risk for falls.

There is a silent, insidious threat within hospitals worldwide. A non-discriminating threat engulfs the healthy and the sick, young and the old. With proper identification, teaching, and precautions, this threat can be completely preventable: falls.

Whose fault is it when a patient falls during their stay in a hospital? Hospitals have an inherent duty to patients to provide a safe, secure environment regardless of disability, financial status, and social standing. Therefore, the hospital must ensure safe conditions tailored for each patient based on a series of protocols.

The Joint Commission, a United States-based nonprofit organization, accredits more than 22,000 health care organizations and programs. This entity has long embodied patient safety; each year, it seeks to improve healthcare by issuing National Patient Safety Goals. The goal is zero harm to patients, and they strive to imbue the phrase "health care" with a sense of reliability, responsibility, and well-being.

In 2007, the United States Congress began identifying costly, preventable, hospital-acquired conditions for which the Centers for Medicare and Medicaid Services (CMS) would no longer pay (Rosenthal, 2007). Falls in hospitalized patients were among the subjects pinpointed in this endeavor. Since October 1, 2008, CMS has designated falls as a "never event," which are serious, preventable medical errors that should never happen. Classified as such, CMS decided to no longer pay the extra costs arising from falls while the patient is in the hospital.

What happens when a patient falls? A cascade of issues may present after a fall, including but certainly not limited to physical injuries such as lacerations, bruising, and bone fractures, mobility impairment, depression, loss of independence, mistrust of hospitals and hospital staff, and a considerable economic burden on health care systems regardless if the consequences are short or long term. Costs associated with a fall may include imaging, such as radiographs (x-rays) or computed tomography scans (CTs), wound repair (such as sutures) and care, additional consults (such as neurology if the patient's mental status has changed), additional time spent in the hospital, requiring a higher level of care while in the hospital, and the addition of physical therapy, occupational therapy, and social work, to name a few.

This activity is designed to increase understanding that falls are a serious, costly medical problem with short-term and long-term inconveniences and complications. Nurses need to be able to identify increased risk of patient falls and correctly use the fall screening assessments that have been created for acute care hospitals to prevent falls.

Upon completion of the learning activity the learner will be able to:

a. Identify risk factors for patient falls and the issues that may present after a fall.
b. Recognize the various fall screening assessments and indications for use including the Morse Fall Scale, Schmid Fall Risk Assessment, Humpty Dumpty Scale, and Little Schmidy Falls Risk Assessment.
c. Identify the importance of a post-fall assessment if there is a fall and the necessary components.

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Falls among hospital inpatients are common, ranging from 2.3 to 7 falls per 1,000 patient days (Hitcho et al., 2004). According to the California Nursing Outcomes Coalition, the fall rate is the "rate per 1000 patient days at which patients experience an unplanned descent to the floor," or better written as fall rate = (# of falls/patient days) x 1000 (Brown et al., 2001). The Agency for Healthcare Research and Quality (AHRQ) estimates that 700,000 to 1 million hospitalized patients fall annually. Each year, about $50 billion is spent on medical costs related to non-fatal fall injuries, and $754 million is spent on medical costs associated with fatal falls (Florence et al., 2018). The sudden withdrawal of funding towards medical costs that arise when a patient falls in a hospital has prompted health care conglomerates to delve into conducting research, constructing fall risk assessments, and creating new fall risk tools and precautions (Fehlberg et al., 2017).

Many studies are expounding on the reasons behind falls, and, likely due to the plenitude of risk factors, contributing factors, and outliers, many of these studies contradict one another. While an observational study by Singh, Okeke, and Edward suggests that there are increased falls in single-bedded (private) hospital rooms, a study examined by Weil states that the incidence rate is highest (34.9 per 1000 admissions) in wards (which are accommodations with six or more patients in a room) and less

Morse Fall Scale *(Adapted with permission, SAGE Publications)*

The Morse Fall Scale (MFS) is a rapid and simple method of assessing a patient's likelihood of falling. A large majority of nurses (82.9%) rate the scale as "quick and easy to use," and 54% estimated that it took less than 3 minutes to rate a patient. It consists of six variables that are quick and easy to score, and it has been shown to have predictive validity and interrater reliability. The MFS is used widely in acute care settings, both in the hospital and long term care inpatient settings.

ITEM	SCALE	SCORING
1. History of falling; immediate or within 3 months	No: 0 Yes: 25	______
2. Secondary diagnosis	No: 0 Yes: 15	______
3. Ambulatory aid		
Bed rest/nurse assist	0	
Crutches/cane/walker	15	
Furniture	30	______
4. IV/Heparin Lock	No: 0 Yes: 20	______
5. Gait/Transferring		
Normal/bedrest/immobile	0	
Weak	10	
Impaired	20	______
6. Mental status		
Oriented to own ability	0	
Forgets limitations	10	______

The items in the scale are scored as follows:

History of falling: This is scored as 25 if the patient has fallen during the present hospital admission or if there was an immediate history of physiological falls, such as from seizures or an impaired gait prior to admission. If the patient has not fallen, this is scored 0. Note: If a patient falls for the first time, then his or her score immediately increases by 25.

Secondary diagnosis: This is scored as 15 if more than one medical diagnosis is listed on the patient's chart; if not, score 0.

Ambulatory aids: This is scored as 0 if the patient walks without a walking aid (even if assisted by a nurse), uses a wheelchair, or is on a bed rest and does not get out of bed at all. If the patient uses crutches, a cane, or a walker, this item scores 15; if the patient ambulates clutching onto the furniture for support, score this item 30.

Intravenous therapy: This is scored as 20 if the patient has an intravenous apparatus or a heparin lock inserted; if not, score 0.

Gait: A *normal gait* is characterized by the patient walking with head erect, arms swinging freely at the side, and striding without hesitant. This gait scores 0. With a *weak gait* (score as 10), the patient is stooped but is able to lift the head while walking without losing balance. Steps are short and the patient may shuffle. With an impaired gait (score 20), the patient may have difficulty rising from the chair, attempting to get up by pushing on the arms of the chair/or by bouncing (i.e., by using several attempts to rise). The patient's head is down, and he or she watches the ground. Because the patient's balance is poor, the patient grasps onto the furniture, a support person, or a walking aid for support and cannot walk without this assistance.

Mental status: When using this Scale, mental status is measured by checking the patient's own self-assessment of his or her own ability to ambulate. Ask the patient, "Are you able to go the bathroom alone or do you need assistance?" If the patient's reply judging his or her own ability is consistent with the ambulatory order on the Kardex®, the patient is rated as "normal" and scored 0. If the patient's response is not consistent with the nursing orders or if the patient's response is unrealistic, then the patient is considered to overestimate his or her own abilities and to be forgetful of limitations and scored as 15.

Scoring and Risk Level: The score is then tallied and recorded on the patient's chart. Risk level and recommended actions (e.g. no interventions needed, standard fall prevention interventions, high risk prevention interventions) are then identified.

Important Note: The Morse Fall Scale should be calibrated for each particular healthcare setting or unit so that fall prevention strategies are targeted to those most at risk. In other words, risk cut off scores may be different depending on if you are using it in an acute care hospital, nursing home or rehabilitation facility. In addition, scales may be set differently between particular units within a given facility.

SAMPLE RISK LEVEL

RISK LEVEL	MFS SCORE	ACTION
No Risk	0 - 24	Good Basic Nursing Care
Low Risk	25 - 50	Implement Standard Fall Prevention Interventions
High Risk	≥ 51	Implement High Risk Fall Prevention Interventions

S.5 Morse fall scale

(10.4 per 1000 admissions) in private hospital rooms.

Regardless of the controversial and inconsistent statistics, fall prevention remains one of the highest-ranking safety interventions and risk management issues in acute care hospitals. An increased risk of patient falls is seen in the following factors: longer length of stay, decreased visual acuity, balance conditions, manual transfer aids, urinary incontinence, cancer, and use of the following medications: chemotherapy drugs, sedatives, anticonvulsants, benzodiazepines, and angiotensin-converting enzyme (ACE) inhibitors (Najafpor et al., 2019). Interestingly, the same study indicates that specific characteristics such as a fall history, poly-pharmacy, stroke, and nurse-to-patient ratio were not significantly associated with falls in hospitals. However, other studies contradict this. The contradictory study finds that with older hospital indirectly patients, the strongest predictor of a patient fall was directly associated with their fall history, and it postulates that a history of previous falls, use of walking aids, and patient disability are strong predictors of future falls (Deandra et al. 2013). Suffice to say, many factors are involved with acute-care hospital falls.

To address this alarming trend of increased patient falls, various fall screening assessments were created for acute care hospitals to adopt, such as the Morse Fall Scale and the Schmid Fall Risk Assessment. These tools guide the nurse in deciding if the patient is at a high risk of falling in the hospital. These assessments are designed to be performed at various points during the patient's stay in the hospital, including a fall risk assessment upon arrival/admission, upon transfer to another level of care, daily or every shift (depending on hospital protocol), when a significant change in patient's status has occurred, or after a fall incident.

The Morse Fall Scale is a six-question assessment designed to predict the patient's likelihood of falling. These six questions ask about the history of falling within the last three months, any secondary diagnoses, ambulatory aids, if there is an intravenous (IV) line present, and assessment of the patient's gait and mental status. If the patient scores 0-24, the patient is considered not at risk, and the recommended action is "good basic nursing care." If a patient is regarded as low risk based on the assessment (with a score of 25-50), the recommended action is implementing standard fall prevention interventions. If the patient scores above 51 points, they are at high risk for falls, and the recommended action is to implement high-risk fall prevention interventions.

The Schmid Fall Risk, another assessment tool, uses five questions to determine the patient's risk for falling. The questions ask about mobility, mentation, elimination, prior history of falls, and current medications (if the patient has taken any anticonvulsants, sedatives, psychotropics, or hypnotics). A score of 3 or above indicates that the patient has a potential fall risk.

While older patients are more susceptible to falls related to their changes in cognition, mobility, and vision, younger patients also may be at risk of falling. There are specific pediatric (greater than 12 months old) fall risk assessments for the pediatric nurse's use, such as the Humpty Dumpty Scale, the Little Schmidy Falls Risk Assessment, and the GRAF-PIF Fall Assessment Tool.

The Humpty Dumpty Scale asks about the child's age, gender, diagnosis, cognitive impairments, environmental factors, response to surgery/sedation/anesthesia, and medication usage. A score of 12 or above indicates a high-risk Humpty Dumpty score, which should prompt the nurse to implement high fall risk precautions.

SCHMID FALL RISK ASSESSMENT*

SCORE	MOBILITY
0	AMB W/NO GAIT DISTURBANCE
1	AMB OR TRANSFERS W/ASSISTIVE DEVICES OR ASSISTANCE
1	AMB W UNSTEADY GAIT AND NO ASSISTANCE
0	UNABLE TO AMBULATE OR TRANSFER
	MENTATION **
0	ALERT, ORIENTED X 3
1	PERIODIC CONFUSION OR DISORIENTATION X 1 OR 2
1	CONFUSION AT ALL TIMES
0	COMATOSE/UNRESPONSIVE
	ELIMINATION
0	INDEPENDENT IN ELIMINATION
1	INDEPENDENT, BUT W FREQUENCY OR DIARRHEA
1	NEEDS ASSISTANCE W TOILETING
1	INCONTINENCE
	PRIOR FALL HISTORY
1	YES – BEFORE ADMISSION
2	YES – DURING THIS ADMISSION
0	NO
1	UNKNOWN
	CURRENT MEDICATIONS
1	ANTICONVULSANTS, SEDATIVES, PSYCHOTROPICS, HYPNOTICS, NEW ANTIHYPERTENSIVES, OPIODS, DIURETICS AND/OR LAXATIVES
	TOTAL SCORE

** Consider History of Dementia or Delirium or Current Delirium as a risk factor equivalent to Periodic Confusion, Disorientation or Confusion at all times when assessing Mentation.

SCORE OF 3 OR ABOVE: PATIENT AT RISK FOR FALLS

The Little Schmidy Falls Risk Assessment asks about mobility, mental state, toileting, history of falls, and medication. A fall score equal to or greater than 3 warrants implementing a high fall risk prevention program.

The GRAF-PIF assessment asks about the length of hospital stay, if there is an intravenous (IV) line present or has been there recently, currently present, or will imminently be physical therapy or occupational therapy involved in the child's care, and if there has been anti-seizure medication given, if there are acute or chronic orthopedic or musculoskeletal diagnoses if there is a history of falling within the past month, and if the patient has fallen during this hospitalization. A score greater than or equal to 2 indicates the child is at high risk for falls.

Pediatric considerations to prevent falls may include the family letting the nurse know if they are leaving the child alone and keeping the child in an age-appropriate crib or toddler bed, in addition to standard fall prevention education.

Click here to view The Humpty Dumpty Falls Prevention Program tool kit.

Reference Guide

Little Schmidy Falls Risk Assessment

- Document the appropriate score in the Patient Care Record or relevant MR
- Patient risk score should be assessed 1.Daily, 2.When the patient condition changes, 3. When transferred to a new department/unit, and 4. Following a fall incident
- Interventions and actions should be documented on Falls Plan or in Progress Notes

Falls Risk Assessment		Score
Mobility		
	Completely Immobile	0
	Ambulant with no gait disturbance	0
	Ambulate or transfer with assistive device	1
	Ambulate with unsteady gait and no assistive device	1
Mental State		
	Coma/unresponsive	0
	Developmentally appropriate and alert	0
	Developmentally delayed	1
	Disorientated	2
Toileting		
	Nappies	0
	Independent	0
	Needs assistance with toileting	1
	Independent with urinary frequency or diarrhoea	1
History of Falls		
	No	0
	Yes before admission	1
	Yes during admission	2
Medication		
	Anticonvulsants, opiods, diuretics, sedatives, bowel prep	1

Select one score per section

Action

Falls score is equal to or greater than 3 or based on patient's diagnosis or patient's condition warrants falls prevention program

1. Commence Falls High Risk Management Plan (*refer to Falls Prevention Clinical Guideline*)
2. Discuss prevention strategies with parents/carers and ensure a copy of Falls safety in hospital – kids health information is given

Colour version (final) – Falls (3) doc. Adapted from the Schmid Fall Score Tool for UCSF Children's Hospital – United States of America

Each patient, regardless of their risk status for falls, should receive universal fall prevention education. Strategies include the following:

- Orient patient to surroundings, including bathroom location, use of the bed, and call light (on admission and with room/location changes).
- Place call light and frequently needed personal objects within easy reach of the patient.
- Encourage patient and family to call for assistance.
- Keep eyeglasses regularly cleaned and accessible.
- Use properly fitting, nonskid footwear or socks.
- Keep floors clutter- and obstacle-free (with attention to a path between bed and bathroom/commode).
- Remove excess equipment, supplies, and furniture from rooms and hallways (such as IV poles).
- Coil and secure excess electrical and telephone wires.
- Clean all spills in the patient room or the hallway immediately. Place signage to indicate wet floor danger.
- Keep the bed in the lowest position unless impractical (as in ICU or specialty beds).
- Secure locks on beds, stretchers, and wheelchairs.
- Provide adequate lighting, especially at night.
- Answer call light promptly.
- Provide patient and family education on fall prevention and safety measures, document education provided, and the extent to which patient and family understand.

If the fall risk assessment indicates that the patient is at high risk for falling, high-risk fall prevention interventions should be implemented in addition to the universal fall prevention strategies, which include the following:

- A High Fall Risk facility-designated sign is placed on the patient's door.
- A Hovermatt®, Hoyer® lift or other manual patient transfer device is used for safe patient transfers.
- Yellow* nonskid socks in place to prevent slipping if the patient is assisted out of bed.
- A yellow fall risk ID bracelet has been placed on the patient's wrist.
- A yellow fall blanket has been placed on top of the patient's covers to help identify staff that they are a fall risk.

- A bed alarm alerts staff if the patient tries to get up without assistance.
- The curtain has been left open for direct view in case the patient tries to climb out of bed without assistance.
- A sitter is requested.
- The patient is in direct view of nurses' station.
- Security asked to assist with observation as able.
- The family asked to remain with the patient if able.
- Unnecessary tubes/lines removed.

** or facility-specific color*

The adage goes, "if it isn't charted, it didn't happen." Lawsuits are finding that nurses are not documenting the implementation of fall precautions after recognizing the patient is a high fall risk. In many facilities, nurses must document a fall risk assessment on every patient, which may be just a few quick clicks for the documenting nurse. However, many facilities do not have a list of fall prevention interventions so readily available for charting, and often, the interventions go uncharted. If a patient falls, it may devolve into a verbal dispute on whether the interventions were applied appropriately or not. As mentioned before, it is difficult to prove that it was done adequately if it wasn't documented. The savvy nurse will recognize this in their practice and develop a method to quickly and thoroughly document the fall precautions, whether it is a narrative charted by memory or the use of a "dot phrase" (for Epic® users) that guides the writer through drop-down menus for personalized charting for fall precautions.

If a patient does fall, it is prudent to do a post-fall assessment. There is an increased risk of intracranial hemorrhage in patients with advanced age, on anticoagulation medications, and known coagulopathy, including those with alcoholism. Once it has been discovered that a patient has fallen, it is important to ascertain if the patient has hit their head. Suppose the patient cannot divulge the facts related to the fall (whether in relation to underlying impaired cognition or new cognitive changes). In that case, the primary nurse should be available to answer all questions related to the patient's history to determine if there has been a change in the patient's cognitive status post-fall. A physical examination should follow, including assessing the circulation, airway, and breathing according to the hospital's protocol. Activation of the emergency response team may be required, and the patient mustn't be moved until they have been assessed for safety to be moved. Examination of the cervical spine is salient, and if there is

Each patient, regardless of their risk status for falls, should receive universal fall prevention education.

The nurse can protect themselves and their patients by accurately and meticulously documenting the fall risk assessment and precautions in place according to the facility's policies.

any potential indication of injury, the cervical spine must be immobilized. The treating medical provider must be notified of a fall, and a provider should assess the patient. Injuries should be noted, evaluated, and treated/dressed if necessary. A post-fall assessment must be completed according to the hospital's protocols ("Tool 3N," 2013).

The post-fall assessment should not only identify etiologic risk factors for the fall but also seek to identify and address underlying causes whenever possible. Interestingly, a study examining the use of a post-fall assessment by registered nurses that sought to identify underlying causes notes a 29.4% reduction in total falls and a 34.0% decline for recurrent fallers (Gray-Miceli, et al., 2010). These declines may be attributed to repetitive and scrupulous use of the post-fall assessment by trained nursing staff, prompting their critical examination after each fall and thereby being able to recognize potential underlying causes early in the patient's care *before* the patient falls.

The post-fall assessment should include questions that address whether the fall was witnessed or not, was the patient identified as a high fall risk before the fall, whether the high-risk fall precautions were implemented before the fall, vital signs before and after the fall, cognitive ability before and after the fall, and asking the patient why they think they fell (ex: were they attempting to go to the bathroom, retrieve a personal item, etc.). The post-fall assessment should also have the user list all medical devices in use, which assistive devices were nearby or in use, the patient's mental and physical status before and after the fall, environmental status at the time of the fall (bed locked, side rails up, call light nearby, personal items within easy reach), and medications that were recently given.

Falls are a prodigious safety issue within acute care hospitals. The knowledgeable nurse can aid in preventing falls by performing a well-documented, correct fall risk assessment, implementing the appropriate fall prevention precautions, and using knowledge gleaned from previous post-fall assessments to scrutinize and eliminate potential risk factors before the patient suffers a fall. The nurse can protect themselves and their patients by accurately and meticulously documenting the fall risk assessment and precautions in place according to the facility's policies. By working cohesively as a team, all healthcare staff can endeavor to reduce patient falls by making universal fall precautions a habit: placing the bed in a low position, the call light within reach, and the side rails up every time the healthcare staff leaves the room.

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Neonatal Resuscitation and Common Areas of Potential Litigation

Love Preet Kaur, RN, M.Sc, CNeonN(c), LNC

Keywords: Neonatal resuscitation, NRP, Periviable birth, Ethical decision making, COVID-19 precautions

The first 60 seconds of life, often referred to as the "Golden Minute" is a crucial period in the newborn's life. The actions performed by healthcare providers during this critical period can have detrimental effects on the baby's prognosis and the long-term future. Neonatal Resuscitation Program (NRP) is an educational program that teaches healthcare providers the skills necessary to perform neonatal resuscitation.

Often resuscitation requires healthcare workers to perform assessments and interventions under rapidly changing circumstances within a short period, leading to potential errors and deviations from the NRP guidelines. This article discusses the NRP standards of care, ethical decision making involved during neonatal resuscitation, the impact of COVID 19 and the common areas of potential litigation during neonatal resuscitation. It provides important considerations for the legal nurse consultant's analysis when reviewing medical records involving neonatal resuscitation.

Most newborns make the transition to extrauterine life without intervention. Within 30 seconds after birth, approximately 85% of term newborns will begin breathing (Weiner et al., 2021).

An additional 10% will begin breathing in response to drying and stimulation. To successfully transition, approximately:

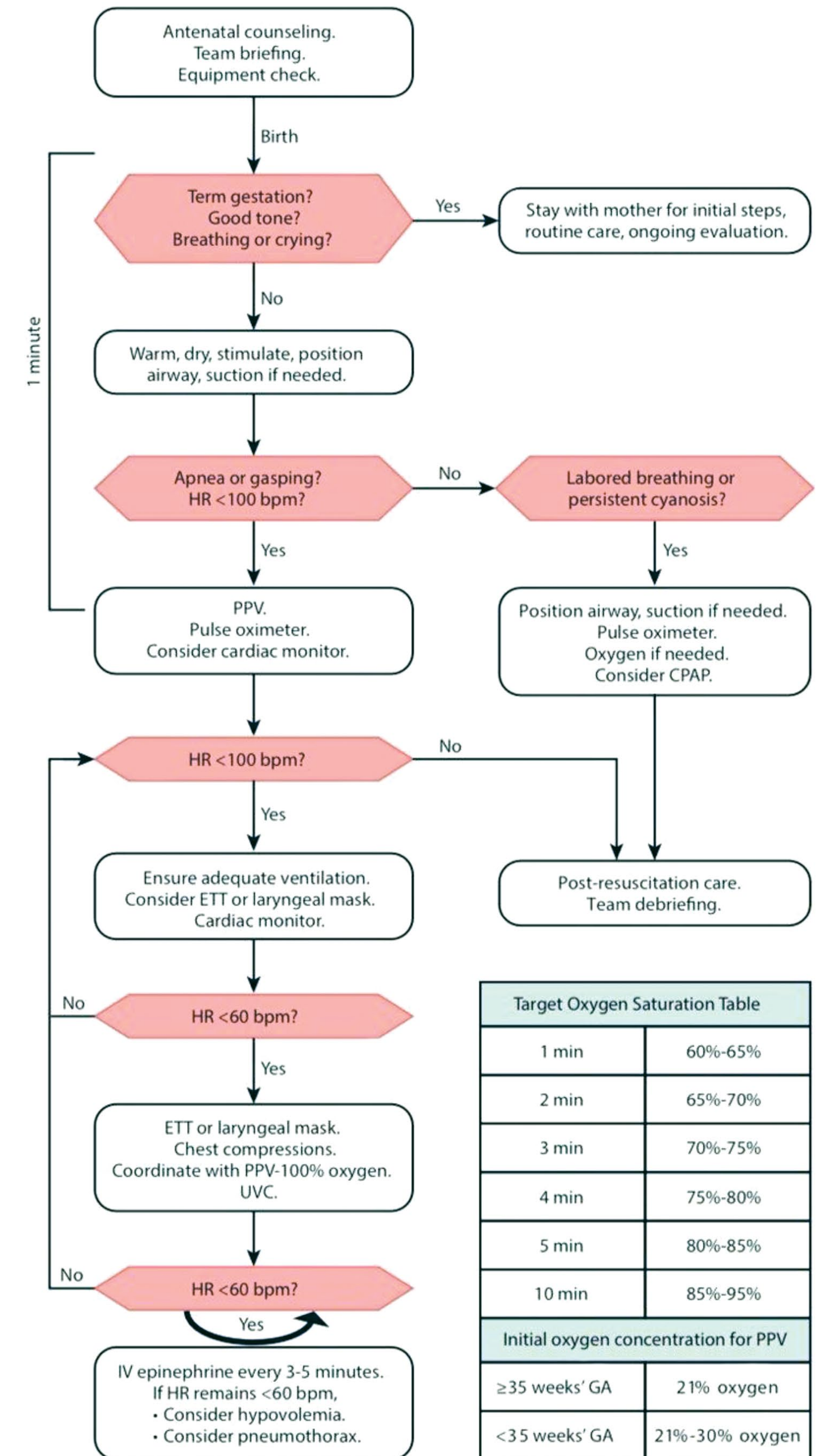
Five percent of term newborns will receive positive-pressure ventilation (PPV)

Two percent of term newborns will be intubated

One to 3 babies per 1000 births will receive chest compressions or emergency medications (Weiner et al., 2021)

The likelihood of requiring these life-saving interventions is higher for babies with certain identified risk factors and those born before full term. Most often, adult cardiac arrest is a complication of coronary artery disease. In contrast, most newborns requiring resuscitation have a healthy heart. When a newborn requires resuscitation, it is usually because respiratory failure interferes with oxygen and carbon dioxide exchange. Ventilation of the newborn's lungs is the single most important and effective step in neonatal resuscitation (Weiner et al., 2021).

The number of personnel present at the time of delivery will depend on the risk factors. At least one qualified health care professional should be present at every birth whose only responsibility is to manage the newly born baby. If needed, this person must be able to initiate resuscitation, including PPV and chest compressions. If advanced resuscitation measures are anticipated, a qualified healthcare professional who can intubate, insert an umbilical catheter or intraosseous needle, and prescribe medication, must be available on site. In case of an anticipated high-risk birth, such as an extremely preterm baby or a prolapsed umbilical cord, a team with sufficient personnel to provide



Target Oxygen Saturation Table	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%
Initial oxygen concentration for PPV	
≥35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

Figure 1: Neonatal Resuscitation Algorithm

The latest 8th edition of the Neonatal Resuscitation Program (NRP) emphasizes ensuring that the team, before the birth of the baby, establishes a plan for the timing of umbilical cord clamping.

PPV, intubate the trachea, perform chest compressions, obtain emergency vascular access, prepare medications and document events should be assembled before the birth. Depending on the setting, this will likely require 4 or more trained staff members. Facilities must develop and practice a system for assembling the neonatal resuscitation team, including how the team will be alerted if risk factors are present, who will be called, and how to call for additional help if necessary (Weiner et al., 2021).

The obstetric and newborn healthcare providers need to coordinate care by establishing effective communication. Before every birth, the antepartum and intrapartum risk factors need to be reviewed and the need for resuscitation should be anticipated by asking four pertinent questions (Weiner et al., 2021):

(a) What is the expected gestational age?

(b) Is the amniotic fluid clear?

(c) Are there any additional risk factors?

(d) What is the umbilical cord management plan?

When reviewing the medical chart, the legal nurse consultant (LNC) will find these issues addressed in the physician or nurse's note before delivery or at the time of delivery. By reviewing the risk factors involved at the time of birth, the number of personnel present during delivery, and when in the process of resuscitation was the team alerted to perform advanced resuscitation skills, the LNC can identify deviations in the standard of care.

DELAYED CORD CLAMPING

The latest 8th edition of the Neonatal Resuscitation Program (NRP) emphasizes ensuring that the team, before the birth of the baby, establishes a plan for the timing of umbilical cord clamping. For most vigorous preterm and term babies, the current evidence suggests that clamping should be delayed for at least 30-60 seconds while the initial steps in the algorithm are performed (Weiner et al., 2021). In term infants, delayed umbilical cord clamping increases hemoglobin levels at birth and improves iron stores in the first several months of life, which may have a favorable effect on developmental outcomes. Delayed cord clamping is associated with significant neonatal benefits in preterm infants, including improved transitional circulation, better establishment of red blood cell volume, decreased need for blood transfusion, transfusion of stem cells, and lower incidence of necrotizing enterocolitis and intraventricular hemorrhage (The American College of Obstetricians and Gynecologists [ACOG], 2020).

Initial steps of newborn care

The initial steps include providing warmth by placing skin to skin on the mother's chest if the baby is stable or under the radiant warmer if further assessment is to be done. Next should be drying, providing gentle tactile stimulation, positioning the head and neck so that the airway is open, and clearing the airway of secretions if needed. If the baby is less than 32 weeks gestation, a polyethylene plastic bag or wrap and a thermal mattress should be prepared. Routine suction for a crying vigorous baby is not recommended unless the baby has poor tone and PPV (Positive pressure ventilation) needs to be started. Vigorous or deep suction should not be performed as it may injure tissues and stimulation of the posterior pharynx during the first minutes after birth can produce a vagal response leading to bradycardia or apnea. Routine tracheal suction with or without intubation at birth for babies born in the presence of meconium is not recommended. The meconium-stained fluid remains a risk factor for resuscitation. A licensed practitioner with intubation skills should be identified and immediately available as these babies may require intubation for tracheal suction or positive pressure ventilation. The response to these initial steps should be assessed in no more than an additional 30 seconds (Weiner et al., 2021).

Positive Pressure Ventilation

If the baby has not responded to the initial steps within the first minute of life, it is not appropriate to continue to provide only tactile stimulation. If the baby has labored breathing, or the oxygen saturation cannot be maintained within the target range despite 100% oxygen, a trial of continuous positive airway pressure (CPAP) should be considered if the baby is breathing, and the heart rate is at least 100 bpm. Administering CPAP may increase the chance of developing a pneumothorax (air leak) and this potential complication should be kept in mind while providing CPAP (Weiner et al., 2021).

For babies who remain apneic or if the baby is gasping or bradycardic (heart rate less than 100/min), delaying the start of PPV beyond the first minute of life worsens outcomes. If the heart rate is less than 100bpm, start PPV even if the baby is breathing. The ventilation rate is 40-60 breaths per minute and the initial ventilation pressure is 20 to 25 cm of H2O. The recommended initial oxygen concentration during PPV is 21% for all babies. For babies less than 35 weeks gestation, the recommended oxygen concentration is between 21-30% (Weiner et al., 2021). To avoid hyperoxemia, the administration of supplemental oxygen should be titrated to achieve target oxygen saturation (SpO2) levels as per the table below for term and preterm babies.

Targeted Pre-ductal SpO2 After birth	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

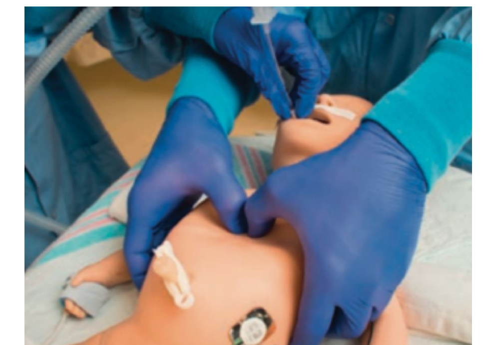
American Academy of Pediatrics, Neonatal Resuscitation Textbook, 8th edition

The fetus normally lives in a physiologically hypoxic environment, and relative hyperoxic exposure can cause an increase in the generation of reactive oxygen species (ROS). Preterm newborns are particularly vulnerable to oxygen toxicity due to inadequate levels of antioxidant enzymes, and hence have decreased protection from oxidative injury of rapidly growing tissues. The developing lung of the neonate is a perfect example of those vulnerable tissues; the endothelial cells and the alveolar type II cells are especially susceptible to oxidative injury (Mohamed et al., 2020).

The toxicity can cause damage to any cell in the body, which has been shown to have the following adverse effects in babies like increased risk of bronchopulmonary disease, injury to the developing brain, retinopathy of prematurity. It is a disease affecting the development of the retinal vasculature characterized by abnormal growth of retinal blood vessels in preterm infants receiving supplemental oxygen therapy (Mohamed et al., 2020).

The most important indicator of successful PPV is a rising heart rate. If the heart rate is not increasing within the first 15 seconds of PPV and the chest movement is not observed, ventilation corrective steps are initiated. The ventilation corrective steps MRSOPA is an acronym for mask adjustment, reposition the head and neck, suction the mouth and nose, open the mouth, pressure increase, and alternate airway. If the heart rate remains less than 60 beats per minute despite at least 30 seconds of PPV that inflates the lungs (chest movement), reassess your ventilation technique, consider performing the ventilation corrective steps, adjust the fraction of inspired oxygen level (FiO2), an alternate airway, usually an endotracheal tube (ETT), should be inserted and 30 seconds of effective PPV should be provided through the alternate airway. After these steps, if the heart rate remains less than 60 bpm, increase the FiO2 to 100% and begin chest compressions (Weiner et al., 2021).

Establishing effective ventilation is the highest priority in neonatal resuscitation. Chest compressions should not be started without first establishing effective ventilation (defined here by good chest movement and bilateral air entry). An ETT or laryngeal mask airway should be inserted before starting chest compressions as they are a better tool to maintain a patent airway, it removes the risk of inconsistent pressures due to the loss of face mask seal and decreased the amount of air tracking into the stomach. The two-thumb technique is the preferred method to administer compressions. Electrocardiogram (ECG) leads should be in place for cardiac monitoring as it is the preferred method for assessing the heart rate during chest compressions. It is important to note that when the heart rate is below 60, the pulse oximeter may not function well due to poor perfusion and is not a reliable source of heart rate. The compression rate is 90 compressions per minute and the breathing rate is 30 breaths per minute. After 60 seconds of chest compressions and ventilation, heart rate should be checked via a cardiac monitor or by auscultation. If the heart rate is 60 bpm or greater, stop compressions and resume PPV at 40 -60 breaths per minute. If the baby's heart rate remains less than 60 bpm despite 60 seconds of effective ventilation and high-quality, coordinated chest compressions, epinephrine administration is indicated, and emergency vascular access is needed (Weiner et al., 2021).



The two-thumb encircling technique of chest compressions. American Academy of Pediatrics, Neonatal Resuscitation Textbook, 8th edition

The umbilical vein catheter (UVC) is the preferred route for vascular access in the delivery room, but the intraosseous needle (IO) is a reasonable alternative and can be used for babies greater than 34 weeks gestation. Epinephrine is indicated when the heart rate remains below 60 bpm after 30 seconds of effective ventilation that moves the chest, and another 60 seconds of coordinated chest compressions and effective ventilation with 100% oxygen. The preferred route of epinephrine is via a UVC or IO. The ETT is associated with unreliable absorption and is unlikely to be effective. That is why only one dose of epinephrine may be administered through the ETT while the UVC is being inserted. Administration of a volume expander is indicated if the baby is not responding and there are signs of shock or a history of acute blood loss (Weiner et al., 2021).

Neonatal Resuscitation Program®, 8th Edition - Neonatal Code Medications Card
The most important and effective step in neonatal resuscitation is ventilation of the baby's lungs.

Neonatal Code Medications

Drug	Dose*	0.5 kg	1 kg	2 kg	3 kg	4 kg	Administration
Epinephrine IV/IO Concentration: 0.1 mg/mL 1 mg/10 mL	0.02 mg/kg Equal to 0.2 mL/kg	IV Dose: 0.01 mg Volume: 0.1 mL	IV Dose: 0.02 mg Volume: 0.2 mL	IV Dose: 0.04 mg Volume: 0.4 mL	IV Dose: 0.06 mg Volume: 0.6 mL	IV Dose: 0.08 mg Volume: 0.8 mL	IV/IO rapid push Flush with 3 mL NS Repeat every 3-5 minutes if heart rate less than 60 bpm
Epinephrine ETT Concentration: 0.1 mg/mL 1 mg/10 mL	0.1 mg/kg Equal to 1 mL/kg	ET Dose: 0.05 mg Volume 0.5 mL	ET Dose: 0.1 mg Volume 1 mL	ET Dose: 0.2 mg Volume 2 mL	ET Dose: 0.3 mg Volume 3 mL	ET Dose: 0.4 mg Volume 4 mL	May administer while vascular access is being established ETT rapid push No need for flush. Provide PPV breaths to distribute into lungs.
Normal Saline IV 0.9% NaCl	10 mL/kg	5 mL IV	10 mL IV	20 mL IV	30 mL IV	40 mL IV	Give over 5-10 min

*The recommended dose range for intravenous or intraosseous administration is 0.01 to 0.03 mg/kg (equal to 0.1 to 0.3 mL/kg).
The recommended dose range for endotracheal administration is 0.05 to 0.1 mg/kg (equal to 0.5 to 1 mL/kg).

These suggested epinephrine doses are based on a desire to simplify dosing for educational efficiency and do not endorse any particular dose within the recommended dosing range. Additional research is needed to ascertain the ideal epinephrine dose.

Assess baby's heart rate 1 minute after epinephrine administration. If the heart rate is still less than 60 bpm after the first dose of intravenous or intraosseous epinephrine, coordinated ventilation and compressions should be continued, and the epinephrine dose can be repeated every 3 to 5 minutes (Weiner et al., 2021).

Neonatal resuscitation can also occur outside the delivery room, for instance in the Neonatal Intensive Care Unit (NICU), post-natal ward, emergency unit, or when infants are born at home. Infants born at home will need to be resuscitated following the same steps of the NRP algorithm but may face challenges in case advanced resuscitation is required.

In 2020, the American Academy of Pediatrics (AAP) Committee on Fetus and Newborn published a policy statement, "Providing Care for Infants Born at Home". The statement addressed resuscitation of the newborn after a home birth, as well as initial care and follow-up. Both the AAP and the NRP believe that the hospitals and accredited birth centers are the safest settings for birth in the United States because planned homebirths are associated with a twofold to threefold increase in perinatal mortality. Therefore, the AAP and NRP do not recommend planned home birth; however, the AAP and NRP recognize that women have the autonomy to choose the location of their baby's birth, and some will choose home birth. Women who choose a planned home birth should be fully informed that in the event of an unanticipated emergency, it is unlikely that the personnel, supplies, and equipment necessary to perform a complex neonatal resuscitation will be immediately available in the home environment, and any delay may result in an adverse outcome for the newborn (Weiner et al., 2021).

Ethical decision-making in neonatal resuscitation

Previous editions of the textbook NRP suggested that it may be reasonable to stop resuscitative efforts if the heart rate was undetectable after 10 minutes of resuscitation. In the latest 8th edition of NRP, it is recommended that a reasonable time frame, for considering cessation of resuscitation effort is around 20 minutes after birth. A recent systematic review completed by International Liaison Committee on Resuscitation (ILCOR) found that stopping resuscitative efforts at 10 minutes may preclude the survival of some newborns who would have survived without significant disabilities (Nolan et al., 2020).

Extending the time frame to consider discontinuing resuscitative efforts may allow the resuscitation team more time to complete all appropriate interventions, achieve the correct balance between continuing too long and stopping too soon, make an individualized decision, and include the family in decision-making and care for their newborn (Weiner et al., 2021).

The care of expectant mothers and infants born at the threshold of viability is one of the most complex and controversial aspects of maternal-fetal medicine (MFM) and neonatal-perinatal medicine (NPM), presenting numerous medical challenges and wide variations in management. The definition of periviable gestation is not standardized. A recent joint workshop including the National Institute of Child Health and Human Development (NICHD), the Society of Maternal-Fetal Medicine (SMFM), and the American College of Obstetrics and Gynecology (ACOG) defined periviable birth as infants born between 20 0/7 and 25 6/7 weeks of gestation. The care of periviable neonates is further complicated by ethical and legal controversies associated with this gestation. The perspectives, values, and priorities of the providers and medical staff may lead to difficult clinical decisions (Muniraman et al., 2017).

A retrospective review of all United States state and federal cases in the Westlaw database from 1980 through 2016 involving peripartum and immediate post-delivery management of infants born between 22 0/7 and 25 6/7 weeks' gestation resulted in 736 results out of which 15 cases met full inclusion criteria. Five cases involved wrongful death or loss of chance claims, where parents wished the newborns to be resuscitated and be provided with life-sustaining interventions, but providers had not resuscitated or discontinued care contrary to parental directives. In one case, the physician had documented parental agreement to discontinue life-sustaining interventions which the parents denied. Three cases involved parents not favoring resuscitation, but the infants were resuscitated and survived with neurological deficits. In seven cases, the parents alleged that they were inadequately informed or misinformed during prenatal counseling about the infant's chances for survival and outcome, resulting in uninformed delivery directives, or not allowed joint decision-making post-delivery (Muniraman et al., 2017).

When reviewing these medical records, the LNC should see if there is valid documentation of assessment of risks on outcomes including survival and long-term neurological deficits, if these risks were communicated to the parents with management options and if there was open communication between parents and healthcare providers after the birth of the baby. As the care of the neonate born at an extremely low gestational age is very complex, it is recommended that the LNC refer to the current Clinical Report published by the American Academy of Pediatrics Committee on Fetus and Newborn and the Obstetric Care Consensus published by American College of Obstetricians and Gynecologists (ACOG).

There is currently no federal law in the United States mandating delivery room resuscitation in all circumstances. There may be individual state laws that may apply to the care of newborns in the delivery room that LNCs should be aware of. In most circumstances, it is ethically and legally acceptable to withhold or withdraw resuscitation efforts if the parents and healthcare providers agree that further medical interventions would be futile, would merely prolong dying, or would not offer sufficient benefit to justify the burdens imposed on the baby (Weiner et al., 2021).

Impact of COVID-19 precautions on Neonatal Resuscitation

COVID-19 has resulted in many practice changes to ensure healthcare providers (HCP) are protected while providing care to COVID-positive mothers and babies. This includes extra layers of Personal Protective Equipment (PPE), placement of the code pink cart outside of the delivery room to prevent cross-contamination, and limited personnel present in the delivery room to provide care to newborns once delivered. When an LNC reviews a neonatal resuscitation case in the context of a COVID-19-positive mother, there needs to be an understanding of the additional challenges faced by the health care providers in caring for such babies.

Mask ventilation and endotracheal intubation are aerosol-generating procedures (AGP) critical to neonatal resuscitation. Modification to ventilation practices during neonatal resuscitation has been proposed to protect HCPs during AGP, based on limited evidence on vertical transmission and aerosolization of SARS-CoV-2. General COVID-19 resuscitation guidelines recommend the use of viral filters on mask ventilation devices to decrease the risk to HCPs. The effectiveness of viral filters depends on mask seal, filter, and device type (e.g., self-inflating bag, flow-inflating bag, and T-piece resuscitators), flow rate, filter integrity, and patient factors. Changes to respiratory equipment or indications for their use may affect HCP workload, introduce equipment uncommon in neonatal care, or lead to neonates receiving supports or interventions unsuited to their needs. Examples include using low flow nasal cannula (LFNC) instead of nasal CPAP to avoid AGP, intubating with cuffed endotracheal tubes, or inserting viral filters in respiratory circuits (Law et al., 2020).

Donning and doffing of PPE takes practice and time which could inadvertently delay resuscitation. PPE itself may further impact individual performance. Eye protection or fogging may hinder vision, interfering with clinical assessments and procedures such as intubation. Respirator masks create resistance to breathing and can cause anxiety and discomfort. PPE can also disrupt interpersonal communications. Face coverings can obscure both verbal and non-verbal communication and decrease speech intelligibility, particularly in a noisy resuscitation environment (Law et al., 2020).

There are also conflicting opinions on whether the neonatal resuscitation should occur directly in the delivery room as it can reduce the extent of contamination and reduce delays in resuscitation or in a space separate from the mother which limits exposure of obstetrical HCPs to neonatal AGP but can also lead to a delay in resuscitation. The factors that would come into play here are to determine how far is the separate resuscitation space and if it has all the necessary equipment required for resuscitation. This inevitably does cause a delay in initiating resuscitation especially when there are limited team members in the room to reduce contamination. This causes minimal team members to change roles and an increase in individual workload.

When transporting a potentially infected neonate to the neonatal unit, avoidance of environmental contamination and bystander exposure are priorities (Ong et al., 2020). Transporting a neonate in an enclosed incubator with a clean transport team in PPE may minimize contamination but requires the presence of additional personnel, PPE consumption, and choreographing of patient movement. All this can lead to a further delay in the neonate receiving emergency lifesaving treatment.

The most common areas of potential litigation during neonatal resuscitation

Neonatal resuscitation requires healthcare professionals to work as a team to

recognize and analyze a large amount of data and integrate it into useful information under intense time pressure. The complexity of this task can lead to deviations from the NRP algorithm and poor patient outcomes. Retrospective and observational studies have shown that errors and deviations from the NRP algorithm are common. In one study, HCPs committed 152 errors in 547 NRP steps (average 27.8% error rate). 54 % of the 100 resuscitations had deviations from the NRP guidelines (Carbine et al., 2000). In another study of 132 resuscitations, HCPs had a 15.9-54.5% error rate, and poor communication was found to be highly correlated with non-compliance with NRP steps (Thomas et al., 2006).

Inadequate supervision of HCPs

The attending neonatologist is considered to have ultimate medical responsibility for the neonates under his/her care and has been held legally responsible for the care provided by other HCPs. An accepted theory of attending liability for the negligent acts of others is respondeat superior, which is Latin for "let the master answer". Under this doctrine, the attending neonatologist will be responsible for the negligent actions of a resident, Neonatal Nurse Practitioner, or Physician Assistant, as long as they were within the scope of employment. Examples might include negligent placement of an endotracheal tube or umbilical line. The attending would not be held responsible for the negligence of a nurse who is employed by the hospital (Fanaroff & Goldsmith, 2019).

Attending neonatologists are expected to provide adequate supervision to trainees and may be held liable for "negligent supervision". In a well-publicized lawsuit, an anesthesiology resident requested assistance for an emergency C-section from his supervising attending. The delayed response in appropriate supervision was alleged to have caused brain damage in the fetus, leading to a $35 million settlement (Arkebauer v Lojeski, 2004).

Failure to have the proper resuscitation team in the delivery room

While nearly every hospital has required physician and nursing personnel to complete NRP every two years, such education does not ensure competence in resuscitation. The American Academy of Pediatrics notes that the completion of the course is not a certification that implies competence. Therefore, the composition of the resuscitation team attending a specific delivery must be tailored to the expected needs of the resuscitation. It is well documented that pediatric residents receive limited training in neonatal intubation and have varying skills in this procedure. If intubation is deemed likely at birth, the team should include personnel who are particularly skilled in the procedure. Considerations would include the gestational age of the fetus, presence of meconium, interpretation of the fetal monitoring strip, and labor events such as vaginal bleeding, prolapsed cord, and shoulder dystocia among others. Nevertheless, for every high-risk delivery (which is defined individually by every hospital within their policy framework), a pediatrician or neonatologist should be present before the baby is born (Fanaroff & Goldsmith, 2019).

Competency-based training records of healthcare professionals can show if the NRP status was renewed every two years which is mandatory for attending deliveries and performing resuscitation skills. Hospitals have the responsibility to conduct frequent mock drills and staff are given extra training to prove competence before they assume independent clinical responsibility. All these records will provide important information to the LNC to substantiate their findings.

An LNC should also review the hospital policies to determine what systems are in place to summon personnel in the event of a code and what is the acceptable time frame for HCPs to reach the patient. Information should be obtained on how personnel is summoned, e.g., overhead page, pager, emergency call system, etc. This can be pertinent to understand if systems in place were followed and identify lapses in communication if any.

Failure to have the proper equipment for neonatal resuscitation

In any situation where a baby is born with a low APGAR (a physical exam performed on the baby at 1 and 5 minutes after birth to determine how well the baby tolerated the birthing process), it is also important to determine if all the emergency equipment that was needed to perform successful resuscitation was present. It is typically the responsibility of the assigned nurse to check the code cart every shift, the record of which is maintained in every unit. The labor and delivery RN as well as the attending NICU RN should also check all the necessary equipment in the warmer to perform the initial steps of care when the baby is born.

In situations, where a baby is rooming in with the mother and needs to be resuscitated, resuscitation efforts must be initiated in the room or unit where the arrest occurred and call for additional help. It is necessary to have a fully stocked crash cart that is nearby and readily available for use in all maternal-neonatal areas.

In one case, almost immediately after birth, Baby M. developed respiratory distress in the delivery room. Although the nurse suctioned and administered oxygen, the neonate became apneic. The physician intubated to suction; however, the nurse could not provide the proper suction tubing to fit

the endotracheal tube. The tube was removed, oxygen provided, and the neonate was re-intubated. The physician asked for an Ambu bag. The only one available had a mask attached to it, which neither the nurse nor physician could remove. Baby M.'s condition deteriorated. The physician provided mouth to endotracheal tube resuscitation until the proper equipment arrived. Baby M survived with the evidence of hypoxic ischemia encephalopathy and cerebral palsy (Verklan, 2004).

The nurse testified that (a) it was her responsibility to stock the delivery room and know how to use the equipment, (b) she did not know why she could not remove the mask from the Ambu bag, and (c) she did not restock the suction tubes/equipment because she did not think she would need them, and (d) she never participated in a delivery in which an Ambu-bag was used. Experts testified that the hospital breached its standard of care by failing to have the proper equipment available and its employees properly trained in the use of such equipment. A $9 million verdict was awarded to the plaintiffs (Brent, 2001a; Mather v. Griffin Hospital, 1988) (Verklan, 2004).

Failure to establish adequate ventilation at birth

The most important aspect of neonatal resuscitation is the establishment of adequate ventilation. The neonate must show signs of appropriate ventilation by increasing the heart rate or evidence of the delivery of adequate tidal volume (i.e., chest rise, auscultation of breath sounds bilaterally, or exhalation of carbon dioxide as indicated by a colorimetric detector). The LNC should compare the NRP algorithm to the resuscitation record to see if the steps of resuscitation were carried out in the correct sequence and in a timely manner. When trying to achieve ventilation, the most common errors could be a failure to start ventilation within 1 minute after birth in case of HR less than 100 bpm, use of inappropriate mask size causing a leak, inadequate pressure used during bag-mask ventilation, airway occluded with secretions and endotracheal intubation not performed in a timely manner.

Delay in administering fluids and/or medications

Up through the 5th edition of the NRP Textbook (published 2006), the resuscitation algorithm used 30 seconds epochs to accomplish the various steps of resuscitation culminating in the use of epinephrine between 90 and 120 s for babies with a heart rate of <60 despite ventilation and chest compressions. Video recordings of actual resuscitations in major medical centers demonstrated these time allotments were too restrictive and they were abandoned in the 6th and subsequent editions of the textbook, published in 2011 and 2016. However, evaluation of the efficacy of resuscitation often cites a delay in administering epinephrine. From the 7th edition onwards, NRP advises that one dose of endotracheal epinephrine may be given, but a higher dose than when delivered intravenously, and that it "may not be effective" (Fanaroff & Goldsmith, 2019).

Failure to monitor: Post resuscitation care

NRP advises that neonates who require positive pressure ventilation in the delivery room should have "post-resuscitation care", defined as an area where cardiorespiratory monitoring can be utilized, and frequent vital signs and evaluations are done. This is generally not the mother's room. Neonates who manifest signs of cardio-respiratory instability may be diagnosed and provided volume, inotropic agents, glucose,

and other therapies with close post-resuscitation monitoring of respiratory and neurologic status, blood glucose, blood pressure, and urine output (Fanaroff & Goldsmith, 2019).

Inadequate documentation

When reviewing the code record, the LNC should be looking for documentation that provides a minute-by-minute account of the resuscitation. If the infant was delivered at noon, the record should reflect the infant's assessment (i.e., color, tone, heart rate, oxygen saturation, and respiratory effort), interventions (bag and mask ventilation, intubation, cardiac compressions, and medications), and response (e.g.,"remains unresponsive, no respiratory effort, heart rate 60 beats per minute") at 12:01, 12:02, 12:03, and so forth (DiCostanzo, 1996).

CONCLUSION

As an LNC, it is important to look at key documentation when reviewing the code pink/blue record to see the timings of key steps in resuscitation, what was done and when and the details of any response from the baby. One of the first studies done that focused on the timings of achievement of several key resuscitation events found out that the timings of crucial resuscitation milestones were often unrecorded in the medical records, whereas in contrast the timing of the withdrawal of resuscitation was uniformly well documented for all babies who died in the delivery room (Heathcote et al., 2018).

It is advised to look at the NRP edition relevant at the time of occurrence of the incident in question as there have been significant changes to the NRP algorithm over the years and the standard of care needs to be evaluated with the relevant practice followed at that time.

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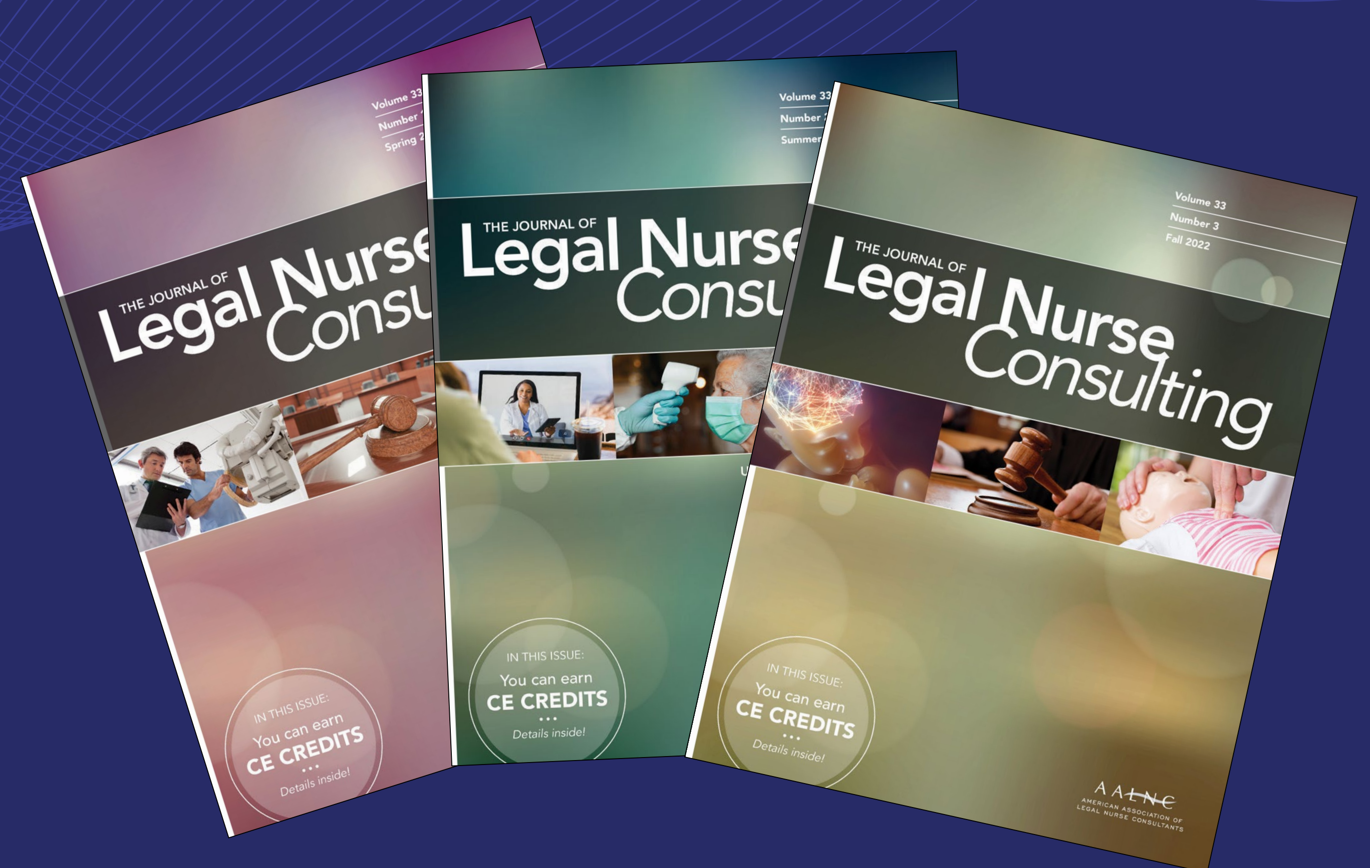

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Civil Redress for Pelvic Organ Prolapse from Pre, Peri, or Pubertal Penetrating Injury with and Without Surgical Intervention

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Keywords: Child Sexual Assault, Full Vaginal Penetration, Pelvic Organ Prolapse (POP), Pelvic Floor Dysfunction (PFD)

Recently, several states implemented legislation providing survivors opportunities for civil redress after childhood rape. Advanced forensic nurses who are nurse practitioners are frequently asked to analyze medical records when plaintiffs seek civil redress following child abuse or rape. This article uses a case series to present a comprehensive, structured approach to the analysis, evaluation, and explanation of subsequent pelvic organ prolapse and pelvic floor dysfunction following the rape of a child. The experts explain the association between degrees of significant findings following full penetration in pre, peri, or pubertal females and subsequent pelvic organ prolapse and pelvic floor dysfunction.

In the past, healthcare providers examining victims of child sexual abuse postulated "it is normal to be normal" following adult male penetration of pre or peri-pubertal female sexual contact (Adams et al., 1994). However, often children delay reporting sexual abuse, finding if the child had an injury, it healed without evidence of injury, especially if not examined within 72 hours of the event (Adams et al., 2020). In 2017, an article appeared to challenge the notion that adult males leave no injury following full penetration (FP) of pre or peri-pubertal female urogenital structures (Hariton, 2012). Re-thinking penetrating urogenital injury at varying stages of childhood development, Speck et al. (2019) performed a scoping review of the literature to support or refute the Hariton notion that significant injury occurs following full penetration of young children.

The authors found a separate body of literature in the surgical arena (Speck et al., 2019). Child abuse literature cites penetration, however slight, a legislated definition of child sexual abuse, and subsequent justification for no expectation of injury. Surgeon literature uses a medical definition to describe full penetration as the transection and repair of structures, which will be used throughout this paper. Surgeons published that most children recover following full penetration injuries *without* medical intervention but with significant physical and emotional scars (Ba & Bhopal, 2017; Stachow, 2020). When victims are examined post-assault, and there is inadequate visualization of the injury's full extent, a subsequent anesthetic evaluation occurs (Mittal et al., 2021). In high-resource health care facilities with surgeons on staff, the genital injury severity scale is used to grade the degree of perineal injury objectively and surgically repair any injuries as needed (Kelly et al., 2017; Mittal et al., 2021). There is no mention in the published literature that surgically repaired children are followed for monitoring of pelvic organ prolapse and pelvic floor dysfunction in pediatric or well-woman primary care.

The rape survivor movement in the 2000s supported victim restitution, promoting legislative change over the next two decades to bring suit against rapists in civil court (Crime Victim Services, 2018; Eleanora & Wijanarko; Johnson, 2019; Oregon Crime Victims Law Center, n. d.). To be successful, the adult child sexual assault survivor plaintiffs needed to document:

(1) significant injury with scars, disfigurement, disability, or other permanent injuries or losses; and/or
(2) psychological or emotional trauma outcomes; and/or
(3) financial impact.

The authors used a deidentified case series design to focus on unique and combined experiences of child sexual assault with full penetration and documented subsequent pelvic floor dysfunction or pelvic organ prolapse, recording the physical assessment findings. The use of simulated pseudo cases of child rape who may or may not have a history of pediatric surgical repair is an innovative, comprehensive, and structured method for teaching the evaluation and subsequent diagnoses of pelvic organ prolapse or pelvic floor dysfunction, particularly when there is a history of child sexual abuse with full penetration as a pre or peri-pubertal female.

BACKGROUND

Visible injury and surgical intervention resulting from a child or adolescent sexual abuse are discussed in the literature (Manjunath et al., 2022; Smith et al., 2018; Torres-de la Roche et al., 2019). The prevalence of child sexual abuse is 24.7% in populations of adult females (U. S. Department of Health and Human Services, 2020). Pelvic floor dysfunction includes chronic pelvic pain, dyspareunia, urinary incontinence, and accidental bowel leakage (Quaghebeur et al., 2021). Approximately 15% of women of reproductive age experience chronic pelvic pain worldwide associated with child sexual abuse (Committee on Health Care for Underserved Women, 2011, Reaffirmed 2017; Krantz et al., 2019).

The diagnostic measure for chronic pelvic pain includes noncyclic, intermittent, or continuous pain, with a three to six-month duration, noting a three-fold prevalence with child sexual assault histories (Krantz et al., 2019). Dyspareunia is defined as painful intercourse with a prevalence of 8% to 21% and is related to child sexual assault (Ghaderi et al., 2019; Tetik & Yalcinkaya, 2021). Pelvic organ prolapse occurs when there is a weakening, stretching, or tearing injury that affects the pelvic floor support system (e.g., muscles, ligaments, and connective tissue) housing pelvic viscera (bladder, intestines, and uterus) (Raju & Linder, 2021). Screening adult patients with pelvic organ prolapse for a history of child sexual

The diagnostic measure for chronic pelvic pain includes noncyclic, intermittent, or continuous pain, with a three to six-month duration, noting a three-fold prevalence with child sexual assault histories.

abuse reveals mixed data resulting in limited information about the association between structural pelvic organ prolapse and child sexual assault with full vaginal penetration.

Child sexual abuse is not considered a risk factor for pelvic organ prolapse but a risk factor for pelvic floor dysfunction such as vulvodynia or dyspareunia. However, evidence shows that many providers do not adequately *screen for or document* child sexual abuse (Cichowski et al., 2013; Farrow et al., 2018). Cichowski et al. (2013) screened for child sexual abuse in a women's clinic, and of 1899 new patients that presented for a clinic visit, 1260 were screened for a history of sexual abuse. Seventeen percent (213 women) reported a history of sexual abuse. In addition to screening for a history of sexual abuse, a secondary finding was to determine whether a history of sexual abuse was associated with pelvic pain, pelvic prolapse, urinary or accidental bowel leakage, or all the conditions. Chronic pelvic pain was the only condition significantly associated with a history of sexual abuse. Limitations to this study included a broad definition for child sexual abuse without specificity about penetration. Evidence demonstrates victims do not disclose child sexual abuse history without significant consideration of the consequence of disclosure and the provider's reaction is consequential (Gewehr et al., 2021, Wilson & Lee, 2021). Consequently, the associations of pelvic organ prolapse and pre-pubertal penetrating injury are not explored or documented, not revisited during well-woman examinations, and not available for data analysis.

The advanced forensic nurse in a nurse practitioner practice uses diagnostic criteria for pelvic organ prolapse (e.g., trauma to muscles, ligaments, and connective tissue supporting the vaginal wall and uterus) to analyze the medical records for supportive documentation. Pelvic organ prolapse results from weakened pelvic floor muscles, fascia, ligaments, and connective tissue resulting in the descent of the wall of the anterior, posterior, or apical parts of the vagina (Raju & Linder, 2021). Approximately 3% of women in the U.S. report symptoms of vagina bulging. However, the prevalence found from provider examination is 40-50%. Contributing to the difference is that most women are asymptomatic (ACOG, 2019).

Risk factors include advancing age, increasing parity, vaginal deliveries, obesity, and constipation. Screening patients for child sexual abuse who present with pelvic organ prolapse is not routine and not typically considered. In addition, when providers screen for child sexual abuse, it is important to remember women who present with pelvic floor dysfunction or prolapse are older and do not remember or do not want to reveal this history. Furthermore, there is no longitudinal research following child sexual trauma who needed pediatric vaginal and pelvic surgery through adulthood for possible complications such as pelvic organ prolapse and pelvic floor dysfunction.

Complicating the child sexual abuse investigation for the nurse practitioner/ advanced forensic nurse is the fact there are two definitions for penetration.

Complicating the child sexual abuse investigation for the nurse practitioner/ advanced forensic nurse is the fact there are two definitions for *penetration*. Penetration is defined from a legal area meaning the *penetration, no matter how slight* (Adams et al., 1994; Adams, 2020), and from a medical area defined as *transecting past the plan into an orifice* (Gallion et al., 2016). The complexity in studying pre and peri-pubertal injury increases when children experience sexual abuse with full penetration of their vaginas and cannot describe what happened or care for the subsequent injury. When screened, positive responses often are delayed disclosures – usually years later. Consequently, without targeted screening, symptoms that follow prepubertal penetrating vaginal injury and the association with scaring and remodeling often go undetected.

Child sexual assault victim trauma is managed based on injury type (Mukwege et al., 2016). Genital trauma can be external injuries affecting the superficial perineal and vagina or internal affecting the vagina and pelvic floor support for the female reproductive system (Fan et al., 2020; Gallion et al., 2016; Mittal et al., 2021; Torres-de la Roche et al., 2019). Providers assess the genital trauma using the genital injury severity scale, which helps determine the seriousness of full penetration anogenital injury and the likelihood of needed surgical repair (Kelly et al., 2017). Surgeons record the surgical repair method and findings of affected systems but rarely record or report the *cause*, e.g., rape or child sexual abuse, as coding is related to surgical interventions and repairs.

Mucocutaneous lesions are minor and not typically documented following child sexual abuse because they are self-limiting, requiring no surgical treatment. Surgeons inspect the child's urogenital structures following full penetration under anesthesia when indicated due to injury severity or child resistance (Lopez et al., 201). The unknown is the impact of stretching and subsequent internal structure injury. One common symptom following full penetration trauma is micturition burning and occasional persistent urinary or accidental bowel incontinence. The explanation is an injury to mucocutaneous integument and soft tissue anogenital structures. The subsequent healing stages are predictable and include hemostasis, followed by inflammation, which stimulates neural pathways for defecation and micturition urges. The urges are self-limiting and, for most, resolve as proliferative and remodeling phases of wound healing occur (Wilkinson & Hardman, 2020). However, the proliferation phase is thought to be responsible for dyspareunic pain syndromes. For victims experiencing persistent incontinence, management consists of targeted exercises and observation with psychological management. Providers play an important role in child sexual trauma and pelvic floor disorders/pelvic organ prolapse. A thorough inquiry and documentation of the thorough history, physical assessment, and diagnostic testing results provide data for researchers to determine associations contributing to best practices when child sexual abuse contributes to adult syndromes. Nouman et al., 2020 noted the reduction in the absence of reporting when suspicious denies pertinent historical documentation and directed treatments, which diminishes possibilities for victim redress in a civil tort years later.

For the nurse practitioner/advanced forensic nurse to explain pelvic organ prolapse in the absence of data, a significant knowledge base about the structure and function and the genesis of the individual's unique presentation of an adult female uro-genitalia is necessary. Generalist forensic nurses specializing in sexual assault care, while skilled in documenting severity and location of superficial integument injury, do not have graduate education in differential diagnosis related to anogenital and urogenital structural function/dysfunction or subsequent symptoms. Nurse practitioner/advanced forensic nurse's knowledge includes differential diagnosis methods founded on the genesis of developmental stages and phases of human organ function; the impact of trauma on the hypothalamus, pituitary, ovarian axis (HPO) on overall maturation, developmental and cyclic hormone releases; predictable histological changes during hormonal interaction with urogenital tissue; and staged integument response to injury across the lifespan. The Hymen Estrogen Response Scale© helps gauge the impact of estrogen on the urogenital tissues across the lifespan (Speck & Lee, 2011). The stages of healing explain symptoms and variations in the appearance of previous injury (Wilkinson & Hardman, 2020) across the lifespan and quantify injury description documentation in BALD STEP© (Carter-Snell, 2011). Few publications cite the data related to any of these scales, contributing to the dearth of information about physical rape outcomes.

CASE STUDIES

The purpose of these simulated case study scenarios is to provide the nurse practitioner/advanced forensic nurse the opportunity to learn approaches to evaluating the child sexual abuse documentation and current diagnoses of pelvic organ prolapse and pelvic floor dysfunction. These case studies are adults who experienced child sexual trauma and sought civil redress from their rapists.

CASE 1 EVENT

Natalia is a 6-year-old female discovered by her mother in the bathroom, putting her bloody underwear in the laundry basket. When the mother asked, "where are you bleeding from?" The child replied, "where I pee-pee." The mother put her on the toilet to look, and she was dripping blood in the toilet from her vulva. Natalia's mother called an ambulance, and the child and her mother were transported to the highly-resourced Level 1 Trauma Center. The pediatric GYN determined the injury was a penetrating vaginal injury and scheduled surgery to explore the extent of the injury. Natalia's vital signs remained stable. When the mother's boyfriend arrived, Natalia pointed to him and said, "He hurt me in my pee-pee," and started crying. According to state law, the physician called child protective services and law enforcement. The mother's boyfriend left the hospital. Natalia's mother said that her daughter does not know the body parts yet because she shields her from "the trashy language."

Natalia's state laws allow civil redress on behalf of the victim of childhood rape. Natalia is now an adult who participates in cognitive behavioral therapy due to her childhood sexual abuse.

DEVELOPMENT

Developmentally, Natalia is naïve to body parts and the structure names, calling the location of the injury "where I pee-pee," implying deficient descriptive language to describe the location and body part. She is also unable to conceptualize internal organs. Developmentally, Natalia trusts, follows direction, and answers direct questions using her familiar language.

MEDICAL EVALUATION AND TREATMENT

Though the surgeon found the cervix and semen in the abdomen, the pelvic abdominal surgery was uneventful. The surgeon inspected and repaired the abdomen and pelvic region support structures. The repair included a laparotomy with inspection and repair of the abdominal viscera and apical[1] portions of the vagina, repositioning, and confirming the position of the cervix and cervical neck for future drainage of menses. The surgeon then repaired the external posterior vaginal wall and perineum. Inspection of the anus was non-contributory. The hymen was completely absent and therefore not rebuilt. Intravaginal estrogen cream was applied to the length of the vagina, and her recovery was uneventful. Upon inspection of the hymen at the post-op visit, the estrogen response created a small hymeneal ridge, with a gap between 5-7 o'clock.

PROSECUTION AND OUTCOME

The state brought charges against the mother's boyfriend, and he pled guilty to several charges, served two years, and now owns a successful business.

CURRENT REQUEST

Natalia's state laws allow civil redress on behalf of the victim of childhood rape. Natalia is now an adult who participates in cognitive behavioral therapy due to her childhood sexual abuse. Her attorney is requesting expert testimony to explain her physical injuries, subsequent pelvic organ prolapse, pelvic floor dysfunction, and the lifelong impact of the penetrating injury on her quality of life and mental health.

MEDICAL FORENSIC EXAMINATION

Natalia is now 22 years old, single, G0P0 nulliparous, and has no risk factors for pelvic organ prolapse or pelvic floor dysfunction. She was evaluated with a physical examination and photographic documentation. Natalie reported her symptoms to be urinary incontinence and frequent constipation, and she described subsequent obstipation[2] requiring pelvic floor support for the evacuation of feces from her megacolon. Previous trauma to the pelvic diaphragm (muscles, ligaments, connective tissues) before the estrogen effect resulted in a notable change to the pelvic floor support structure, including stretching and tearing the internal ligaments, muscles, and tissues. The provider documented a stage 3 pelvic organ prolapse consisting of the anterior and posterior vaginal wall prolapse along with uterine prolapse and uterine prolapse. Upon further evaluation of the documentation, there was no evidence of a hymen membrane, and she had a starburst melanin coloration to the vestibular tissue, supporting her assertion of penetration as a child (before endocrine activation from the pituitary gland). At the pre-menarchal age, the hymen is a thin membrane without hypertrophy and hyperplasia and therefore easily disrupted visible capillary structures. Supporting the continuous remodeling of scars, the provider palpated and documented keloidal scar formation was present between 5-7 o'clock on the hymenal rim and perineum extending 1 ½ centimeter. There was also enlarged vaginal introitus and transverse vaginal adhesions, which suggest significant injury that stretched the soft tissue and disrupted the pelvic diaphragm.

NURSE PRACTITIONER/ ADVANCED FORENSIC NURSE CONSIDERATIONS

Hospital records are kept for a limited time and are no longer available. However, the attorney discusses with Natalie his plans to request adjudicated case files from the time of the event to assess for any possible medical records. However, in this case, Natalie's mother kept medical records from Natalie's childhood sexual abuse medical treatment. Natalie brought her childhood medical records and the medical records related to her pelvic floor dysfunction symptoms of urinary incontinence and constipation/ obstipation from the posterior vaginal prolapse for review.

CASE 2 EVENT

Josephine is a 9-year-old female who had blood in her panties. The mother reported she assumed the child had started her period. The next day, the child said her 16-year-old cousin put a "stick" in her bottom. Since Josephine was still bleeding, her mother brought her to the hospital to be checked. The pediatric gynecologist determined that the injury was a penetrating injury and could visualize a portion of the tear extending 1 centimeter from the external perineum through the anterior section of the posterior fourchette. The physician could not see the introital or vaginal tissue due to Josephine's resistance throughout the examination. In response, surgery was scheduled so the surgeon could evaluate the extent of the injury. In addition, because Josephine reported a "stick" placed inside, the surgeon would also look for foreign bodies. Josephine's vital signs remained stable throughout the procedure. A rape kit was not collected before surgery due to the child's resistance to the emergency department evaluation. Still, samples were taken during surgery and sent to the hospital laboratory for analysis. According to state law, the physician reported the situation to child protective services and law enforcement. Law enforcement brought a sexual assault nurse examiner, but the child remained non-cooperative; therefore, a follow-up appointment was made at the local Child Advocacy Center for a forensic interview. Law enforcement would rely on the surgery's documentation and the surgeon's clinical judgment in adjudicating the case.

DEVELOPMENT

Josephine was curious, a good student, and trusted family members. She was interviewed later by the forensic interviewer at the Child Advocacy Center and disclosed that the cousin had been touching her since she was six years old. She also revealed that he had never put a stick "up her" before.

MEDICAL EVALUATION AND TREATMENT

The surgical inspection was uneventful, but the surgeon repaired the tear near the vestibule that extended from the perineum through the fossa navicularis, hymen, and posterior vaginal wall 1 ½ centimeters. Treated with intravaginal estrogen cream, her recovery was uneventful. There was no foreign material in the vagina, and the posterior vagina and perineum had no communication with the abdominal spaces of the cul de sac. The forensic laboratory also received rape kit samples taken during surgery. The results noted sperm in the vaginal wash, with a second laboratory analysis for confirmation. Fortunately, the sexually transmitted infection workup was negative, and prophylaxis was administered according to the Centers for Disease Control and Prevention Guidelines.

PROSECUTION AND OUTCOME

The forensic laboratory found no DNA from the collected swabs in the rape kit. However, the sperm from the posterior fornix, found by the hospital laboratory technologists, confirmed penile penetration. The state brought charges against Josephine's cousin and remanded him to juvenile facilities until he was 20. He is now employed as a plumber.

CURRENT REQUEST

Josephine's state law allows for civil redress on behalf of victims. Josephine is now an adult but struggles with addiction. After attending her group addition support meetings, she realized her rape history was the cause of her depression and drug use. Her attorney requests expert testimony to explain Josephine's subsequent pelvic organ prolapse, pelvic floor dysfunction, and the mental health impact of the child sexual abuse and penetrating injury.

MEDICAL FORENSIC EXAMINATION

Currently, Josephine is 35 years old, single, G3P3SAb1 multiparous with vaginal deliveries of pre-term infants, all < 1600 grams (<3.5 pounds). The attorney scheduled Josephine for a physical examination with photographic documentation, Josephine reported her symptoms as dyspareunia, occasional stress incontinence, urinary tract infections, and frequent constipation/ obstipation. In addition, she reported periodic accidental bowel leakage. The provider noted a stage 2 pelvic organ prolapse with anterior and posterior vaginal wall and uterine prolapse. The nurse practitioner/advanced forensic nurse understands that the previous trauma to the urogynecological structures, with little estrogen present to assist with

[1] Apical means the top of the vagina, distal from the orifice.
[2] Obstipation is the inability to evacuate feces without manual support of the perineal body.

tissue elasticity, resulted in the stretching and tearing of the pelvic floor and the internal ligaments/connective tissue. The result is pelvic organ prolapse with reports of diminished quality of life. In addition, there was evidence of an estrogenized hymenal tissue from 1-4 and 7-11 o'clock.

Furthermore, the area between 4 to 7 o'clock had palpable keloidal scarring that extended from the posterior vaginal area through the vaginal vestibule into the perineum. Finally, the melanin disruption revealed a significant separation from the penetration injury. The nurse practitioner/advanced forensic nurse's review of the documentation supported Josephine's assertion that the child sexual abuse resulted in stretching of the soft tissue with an injury during her peripubertal development, affected her mental health resulting in depression and substance use disorder, contributing to the current adjudication of the case.

ADVANCE PRACTICE FORENSIC NURSE CONSIDERATIONS

There is a dearth of studies looking for associations between child sexual abuse and pelvic organ prolapse. The literature has significant support for perineal changes due to vaginal deliveries of large infants, reported use of forceps during delivery, or other types of injury to the pelvic floor. However, in this case, Josephine's vaginal deliveries were premature, supporting the injury was from the documented childhood penetration.

CASE 3 EVENT

Catherine was a 14-year-old female who babysat for neighbors. The parents of the children repeatedly drugged her and their children with hallucinogens for the purpose of "having an orgy." She reported that her memory is fuzzy, but the sexual abuse happened over two years when she was 13 to 15 years old. She remembers the parents of the children she babysat had used sex toys, objects, their fingers, fists, and penis to penetrate her and their children. She is currently participating in trauma-focused cognitive behavioral therapy.

DEVELOPMENT

As an adult, Catherine overcame addiction, cutting, institutionalization, and a diagnosis of bipolar disease. She is now 65 years old, independently wealthy, and continues her continuous trauma-focused cognitive behavioral therapy for rape memory trauma assistance. She is married with two adult children. As part of her recovery, she desires to sue the rapists. She hopes that if convicted, their names will be added to the sex offender registry, limiting their access to children.

CURRENT MEDICAL EVALUATION

Catherine's complaint of sexual assault was never evaluated when she was a child.

PROSECUTION AND OUTCOME

Since the law changed, victims can bring charges at any time in a civil tort. However, the patient desired a criminal case. After review, the state declined to prosecute the couple for the crime due to the lack of evidence, the age of the accused couple, and Catherine's mental health and addiction history. The civil court allowed her case to move forward. She desired no monetary outcomes but wanted to label the couple on the sex-offender registry. She was also willing to pay all fees should she lose her case. The couple's children are deceased and unable to support her assertions in the civil tort.

CURRENT REQUEST

While the prosecution declined Catherine's request for a criminal prosecution, the state of Catherine's former residence allows for civil redress on behalf of victims. Now, Catherine can move forward with her plaintiff charges, and her attorney requested a sexual assault nurse examiner to perform a physical examination and document findings with photographs. In addition, Catherine's attorney requested a nurse practitioner/advanced forensic nurse as a subject matter expert to evaluate all documentation submitted to assess for supporting evidence validating her injuries.

MEDICAL FORENSIC EXAMINATION

Catherine is now a 65-year-old female, married, G2P2 multiparous with a history of C-section deliveries of pre-term infants. During the physical examination with photographic documentation, Catherine reported her symptoms of urinary stress incontinence to the forensic nurse. The nurse found no evidence of pelvic organ prolapse. Previous trauma to the urogynecological structures when there is adequate estrogen effect resulted in minor changes without stretching the pelvic floor and internal ligaments/connective tissue. Upon further examination, there was evidence of circumferential hymenal tissue, and palpable horizontal adhesive scarring along the posterior vaginal wall thought to be episiotomy scaring.

> Since the law changed, victims can bring charges at any time in a civil tort. The civil court allowed her case to move forward. She desired no monetary outcomes but wanted to label the couple on the sex-offender registry.

> The nurse practitioner/advanced forensic nurse expert opinion explains the link between the victim's personal history of the child sexual assault and the analysis of the documented record.

NURSE PRACTITIONER/ ADVANCED FORENSIC NURSE CONSIDERATIONS

The current medical evaluation was typical of a menopausal female with hymeneal stretching. There are scars on the posterior vaginal wall distal to the hymenal corona that does not transect the hymeneal tissue. Palpation reveals minor scarring and no pelvic organ prolapse. The findings do not support nor dispute Catherine's assertion of multiple penetrations or stretching of the soft tissue during her early reproductive years. The expert in the case neither supported nor refuted her assertions. The civil court adjudicated the claim, resulting in a permanent record for the defendants with charges of sexual abuse. However, the court declined to register the defendants (couple) on the sex offender registry due to their ages of 78 and 80. The court ordered the plaintiff (Catherine) to provide remuneration for their expenses. In the end, Catherine was happy with the outcome as the defendants (couple) have a permanent record of the sexual abuse against her.

SUMMARY

The article proposes to provide information to nurse practitioners/advanced forensic nurses when functioning as subject matter experts in cases of adults with a history of child sexual abuse who are now seeking redress in the court system. It is important to remember that the victims with a history of child sexual abuse seeking redress may have pelvic organ prolapse and pelvic floor dysfunction from other causes, including early penetration. These conditions may be the sequelae from pre and peri-pubertal penetration. Hopefully, their history of child sexual abuse and subsequent physical and psychological life experiences has been thoroughly documented to validate their lived experiences.

The nurse practitioner/advanced forensic nurse expert opinion explains the link between the victim's personal history of the child sexual assault and the analysis of the documented record. Documented factors such as the victim's personal history of the sexual assault, including the age of the sexual assault, the physical development at the time, the size of the object used for penetration, if applicable, and the type and extent of the vaginal mucosa and pelvic support injuries, and any surgical interventions are important. The results of an analysis by the expert may lead to a positive outcome for the victim.

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