Neonatal Physical Therapy. Part I: Clinical Competencies and Neonatal Intensive Care Unit Clinical Training Models

Jane K. Sweeney, PT, PhD, PCS, FAPTA, Carolyn B. Heriza, PT, EdD, FAPTA, and Yvette Blanchard, PT, ScD

Doctoral Programs in Pediatric Science (J.K.S., C.B.H.), Rocky Mountain University of Health Professions, Provo, Utah; Pediatric Rehab Northwest LLC (J.K.S.), Gig Harbor, Washington; and Physical Therapy Program (Y.B.), University of Hartford, Hartford, Connecticut

Purpose: To describe clinical training models, delineate clinical competencies, and outline a clinical decision-making algorithm for neonatal physical therapy. Key Points: In these updated practice guidelines, advanced clinical training models, including precepted practicum and residency or fellowship training, are presented to guide practitioners in organizing mentored, competency-based preparation for neonatal care. Clinical competencies in neonatal physical therapy are outlined with advanced clinical proficiencies and knowledge areas specific to each role. An algorithm for decision making on examination, evaluation, intervention, and re-examination processes provides a framework for clinical reasoning. Because of advanced-level competency requirements and the continuous examination, evaluation, and modification of procedures during each patient contact, the intensive care unit is a restricted practice area for physical therapist assistants, physical therapist generalists, and physical therapy students. Conclusions/Practice Implications: Accountable, ethical physical therapy for neonates requires advanced, competency-based training with a preceptor in the pediatric subspecialty of neonatology. (Pediatr Phys Ther 2009;21:296–307) Key words: clinical competence, reference standards/clinical, high-risk infant, neonatal intensive care units, neonatology, physical therapy, clinical practice guidelines, preterm infant, training models

INTRODUCTION

Neonatal physical therapy is an advanced practice area in pediatric physical therapy that has evolved from the early 1970s when regional neonatal intensive care units (NICUs) were established and neonatal mechanical ventilation became available to increase survival in infants born preterm in tertiary units. In today’s NICUs and intermediate care units, neonatal physical therapists (PTs) require advanced training and competencies to safely and effectively meet the neurodevelopmental and musculoskeletal needs of infants who have been physiologically unstable as well as the educational and emotional needs of their parents, who are highly stressed. The neonatal PT must acquire the comprehensive knowledge and clinical competencies in neonatal care to participate as equal partners with the team of neonatal nurses and neonatologists who have completed subspecialty neonatal training and certification in their respective disciplines.

Clinical practice guidelines for pediatric PTs in the NICU are presented in two sections: part 1: specialized training models, clinical competencies, and decision-making algorithm and part II: NICU practice frameworks and evidence-based practice considerations. This article focuses on part 1 with part II to follow in the next issue of Pediatric Physical Therapy.

CLINICAL TRAINING

Neonatal practice is a highly specialized area within pediatric physical therapy in which vulnerable infants with complex medical, physiological, and behavioral conditions may inadvertently be harmed through examination and
intervention procedures. The NICU is not an appropriate setting for PT assistants, PT generalists, and PT students. Pediatric PTs need expanded training in many areas including family systems, NICU environment, collaborative team work in a critical care unit, infant development, brain development, physiological evaluation and monitoring, and infant neurobehavioral functioning. Even routine caregiving procedures may pose risks to fragile neonates with physiological and metabolic instability and incompletely developed musculoskeletal, neuromuscular, cardiovascular/pulmonary, and integumentary systems. Continuous examination and evaluation are required during each contact to determine whether the infant is beginning to move outside the limits of physiological, motor, or behavioral state stability during handling or feeding. Because of the complexity involved in communication and teaching for stressed, grieving families, advanced training and mentoring are indicated in grief management, crisis intervention, family systems, and adult learning approaches.

Several clinical training models may be considered by pediatric PTs preparing for neonatal practice: precepted practicum, neonatology fellowship, or neonatal training as a part of a pediatric residency. The length of clinical training in neonatal care may vary from 2 to 6 months depending on the following variables:

- Practitioner’s previous experience in pediatrics, especially early intervention practice, hospital-based infant and pediatric care, and exposure to training in behavioral observations of fragile neonates. Practitioners with previous experience and training with fragile infants will likely require a shorter practicum duration to become independent in competency-based training requirements;
- Individualized, precepted practicum based on the level of acuity and regional and local variables such as cultural diversity and healthcare reimbursement to match the demographics of the future NICU practice setting of the trainee; and
- Completed American Physical Therapy Association (APTA)-accredited neonatology fellowship or pediatric residency program that includes a neonatology rotation.

Resources on neonatal topics to support clinical training are available on the Neonatology Special Interest Group link on the Section on Pediatrics, APTA Web site: www.pediatricapta.org. Parent education brochures, NICU-related videos/CDs, and continuing education courses are outlined.

**Precepted Practicum**

Sequenced, gradual entry to neonatal care is advised with clinical experience starting with infants born full-term and older, medically fragile, hospitalized children requiring respiratory equipment and cardiorespiratory monitor instrumentation. These children, while medically fragile, are usually more stable than infants born preterm and on ventilator equipment in the NICU. As such, they are less vulnerable to inadvertent overstimulation from professionals in a subspecialty training process. Gradual entry to the NICU after experience in a pediatric ICU, pediatric ward, newborn nursery, and intermediate care nursery is strongly advised before attempting to examine or intervene with infants and parents in the NICU. Observations of nursing care and respiratory therapy for fragile infants with complex medical conditions are additional valuable components in mentored training.

Exposure to the developmental trajectory and neuromotor patterns in outpatient follow-up for NICU graduates is a critical learning experience for all neonatal therapists and should be included in a precepted practicum. This valuable experience helps develop a perspective on various neonatal neuromotor findings (ie, asymmetry, tone abnormalities, jittery movement), which may turn out to be transient. The clinical follow-up also provides valuable opportunities to see the parents outside the NICU environment, learn about their ongoing challenges and successes in caregiving, and adapt the neonatal therapy program to their current priorities. Observation and participation with pediatric PTs working with NICU graduates in home-based and community-based early intervention programs are advised to enhance NICU discharge planning skills and liaison with community resources.

Precepted practicum opportunities may be accessed through selected medical centers. An alternative method is university-based, specialized training modules for experienced pediatric therapists through directed clinical studies as a part of advanced doctoral study.

**Residency or Fellowship Training**

Now that the opportunity for residency training in pediatrics is offered in the United States, PTs may access precepted NICU training through a pediatric residency program. Pediatric residencies accredited by the APTA have a minimum length of 10 months, a part of which may be conducted in an NICU setting depending on the practice scope of the residency program. Shortly, APTA-accredited neonatology fellowship programs will be available and will offer comprehensive preparation for appropriate, accountable, evidence-based, and ethical practice in neonatal physical therapy. Regardless of the model of training selected for neonatal practice preparation, clinical competencies specific to newborn infants and families should guide the training and provide an evaluation structure for trainees.

**CLINICAL COMPETENCIES**

The clinical roles and proficiencies for neonatal PTs, developed by task forces from the Section on Pediatrics, APTA, were first documented in 1989 and expanded in 1990. The competencies for neonatal physical therapy practice in these current updated practice guidelines are delineated by roles, clinical proficiencies, and knowledge areas. The roles of the neonatal PT such as screening, examination/evaluation, intervention, consultation, scientific inquiry, clinical education/professional development, and administration are organized in Tables 1 to 7. The neonatal
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<th>Roles</th>
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<td>Screen NICU infant population to determine the need for physical therapy services based on established referral or diagnostic criteria.</td>
<td>• Identify and interpret perinatal and medical history and current infant status by chart review and interviews of neonatal caregivers to determine neurodevelopmental risk.</td>
<td>• NICU medical terminology and abbreviations.</td>
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<td>• Identify and interpret family information related to infant caregiving by interviews of family members to analyze potential environmental risk.</td>
<td>• Epidemiology and pathophysiology of prenatal, perinatal, and postnatal diagnoses on subsequent neurodevelopment.</td>
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<td>• Observe infant-parent (or designated caregiver) caregiving patterns, recognize adaptive and maladaptive behaviors, and determine need for additional family support services.</td>
<td>• Family systems and interview processes.</td>
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<td>• Recognize consistent signs of neurobehavioral organization or disorganization in the physiological, motor, and state systems through repeated observations of infant caregiving and social interaction.</td>
<td>• Infant-parent interaction patterns and attachment process among families of infants developing typically and at high risk.</td>
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<td>• Identify infants for referral to PT through participation in NICU medical or developmental rounds.</td>
<td>• Etiology and pathophysiology of common medical conditions encountered in the NICU population.</td>
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<td>Develop and implement a risk management plan for each infant to prevent neurobehavioral disorganization (physiological, motor, and state systems) and secondary complications in musculoskeletal, neuromuscular, and integumentary systems and to maximize neurodevelopmental function.</td>
<td>• Recognize physiological status in an infant by interpreting autonomic responses from the infant (eg, heart rate, respiratory rate and breathing pattern, oxygen saturation, color, blood pressure, and temperature) and data from monitoring equipment during physical therapy examination and intervention, routine care, feeding, and social interaction.</td>
<td>• Typical and atypical prenatal and postnatal development.</td>
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<td>• Identify and interpret infant attempts and successes at self-regulation reflected through behavioral cues in physiological status, movement and posture, state, attention, and social interaction.</td>
<td>• Etiology and pathophysiology of common medical conditions encountered in the NICU population.</td>
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<td>• Conduct observation of the infant prior, during, and after handling to determine neurobehavioral readiness, cost, and recovery related to physical therapy examination and intervention.</td>
<td>• Typical developmental competencies of infants at various gestational ages.</td>
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<td>• Recognize and prevent potential and iatrogenic neuromusculoskeletal, integumentary, and infection complications and implement appropriate positioning strategies to prevent or ameliorate these impairments.</td>
<td>• Indications for and effects of general medical procedures in neonatal care.</td>
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<td>• Locate all leads, lines, and respiratory tubing from the infant to the medical equipment and explain the general function of each attached equipment unit.</td>
<td>• Effects of the NICU physical environment (light, sound, taste, smell) on the infant.</td>
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<td>• Demonstrate appropriate handling of infants with increasingly complex medical needs on physiological monitors, respiratory equipment, infusion or parenteral feeding lines, and other medical support devices.</td>
<td>• Acceptable range of physiological parameters based on acuity levels and ages of neonates.</td>
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<td>• Analyze and modify the physical and social environment using environmental support measures (eg, positioning aids, light, and sound control measures) and individualized caregiving procedures to optimize neurodevelopment of all infants and, in particular, neurobehavioral responses of infants at high risk to physical therapy examination and intervention.</td>
<td>• Range of neuromuscular and musculoskeletal parameters based on ages of neonates.</td>
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NICU indicates neonatal intensive care unit.
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| Examine infant and interpret findings. | ● Select and conduct clinical examinations and evaluations appropriate for infant’s gestational age and physiological stability.  
● Administer standardized tests and measures with modification (or stopping) to accommodate the infant’s neurobehavioral and physiological changes, respiratory and infusion equipment, nursing/caregiving schedule, and family concerns and priorities.  
● Evaluate neurobehavioral vulnerabilities and level of function and recommend developmentally appropriate plan of care. | ● Movement characteristics of infants born at term or preterm gestation, including range of motion, developmentally relevant primary movements and postural control, developmentally appropriate emergence of flexion and extension patterns, and developmental progression.  
● Infant sensory and perceptual development.  
● Infant behavioral repertoire (physiological, motor, state, and interaction).  
● Oral motor development, feeding patterns (readiness cues, suck/swallow/respiratory coordination, pacing), feeding positions and equipment, breast-feeding, and lactation.  
● Description, administration, and psychometric characteristics of a minimum of four infant instruments:  
  - Early Feeding Skill (EFS) Assessment.\(^1\)  
  - Hammersmith Neonatal Neurological Examination (Dubowitz).\(^4\)  
  - Finnegan Neonatal Absence Scale.\(^3\)  
  - General Movement Assessment (Prechtl).\(^6\)  
  - Neonatal Behavioral Assessment Scale (NBAS).\(^7\)  
  - Neonatal Infant Pain Scale (NIPS).\(^8\)  
  - Neonatal Oral-Motor Assessment Scale (NOMAS).\(^9\)  
  - Newborn Behavioral Observation (NBO).\(^10\)  
  - Newborn Individualized Care and Assessment Program (NIDCAP).\(^11\)  
  - NICU Network Neurobehavioral Scale (NNNS).\(^12\)  
  - Nursing Child Assessment Feeding (NCAF) Scale.\(^13\)  
  - Premature Infant Pain Profile (PIPP).\(^14\)  
  - Test of Infant Motor Performance (TIMP).\(^15\)  
  - Test of Infant Motor Performance Screening Inventory (TIMPSI).\(^16\)  
● Neonatal structural and functional impairments, activity limitations, and participation restrictions involving posture and movement. |
### TABLE 3
Planning and Implementing Neonatal Intervention

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<th>Roles</th>
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| Design, implement, and evaluate intervention plans and strategies in collaboration with the family and neonatal team. | ● Collaborate with the infant’s medical team and family to identify measurable long-term and short-term intervention goals to optimize functional outcomes and minimize risk.  
● Determine frequency, intensity, and methods (e.g. direct, consultative) for implementing a developmentally appropriate physical therapy intervention plan.  
● Apply appropriate hand placement, support, and adjustments during handling of neonates.  
● Implement therapeutic strategies appropriate to gestational age and matched to the infant’s physiological, motor, and state regulation strengths and vulnerabilities and neurodevelopmental risk. These strategies may include positioning, skin-to-skin holding (kangaroo care), handling, hydrotherapy (swaddled immersion), splinting, taping, oral-motor/feeding, selective range of motion (infants with congenital joint mobility restriction), soft tissue mobilization (surgical scar release), and adaptive equipment use.  
● Collaborate with neonatal nurses, nurse manager, and developmental care committee to implement modification of the physical, sensory, and social environment in the NICU (e.g. 24-hr rest/activity perspective; day-night cycling; feeding on demand; non-handling quiet periods).  
● Collect data, monitor progress, evaluate effectiveness, and modify therapeutic strategies, plan, and goals accordingly to accommodate changes in the infant’s neurodevelopment.  
● Demonstrate successful strategies to promote family-infant interaction and attachment.  
● Act as a resource to nursing staff members and families for unit-wide implementation of evidence-based, developmentally appropriate practices and therapeutic strategies into daily caregiving.  
● Use parent concerns and priorities to guide the design and implementation of intervention. | ● Strategies for facilitation of movement and posture in infants born prematurely or with medical complications.  
● Evidence base for positions to prevent or reduce deformities and to increase function in infants.  
● Infant respiratory control and feeding parameters (e.g., coordination of suck, swallow, and breathing, feeding readiness cues).  
● Range of bottle and nipple sizes, nipple flow rates, and specialized feeding devices (Haberman Feeding System; cleft palate adaptations, and breastfeeding aids).  
● Infant self-regulation behaviors.  
● Family-centered care models and the effect of family-centered care practices on family outcomes.  
● Cultural (family/parents; nursing) differences in caregiving and effects on family-infant interaction, family well-being, and infant development.  
● Grief and bereavement processes. |
| Develop and implement discharge plans in collaboration with caregivers and community resource representatives. | ● Formulate transition plans for discharging infants to their homes and communities, short-term rehabilitation facilities, or surgical centers.  
● Create linkages to community resources, early intervention programs and NICU follow-up clinics.  
● Educate parents, neonatal caregivers, and community resource representatives on:  
  - Potential injuries from infant toys, seating devices, “jumpers,” and walkers in home environments;  
  - Risk of torticollis and plagiocephaly from prolonged asymmetrical head position during sleep and awake periods;  
  - Supine sleeping according to the recommendations from the American Academy of Pediatrics;  
  - Provision of opportunities for supervised play time in prone position during awake periods;  
  - Positioning and handling to modify atypical postures and movements if present in neonates.  
● Monitor physiological and behavioral tolerance during predischarge car seat trials and recommend and fit alternate equipment as needed (car bed). | ● Group dynamic processes.  
● Infant and caregiver needs in the home environment including environmental modifications to support infant behavioral regulation.  
● Mechanisms of acquiring positional plagiocephaly and secondary torticollis and examination and intervention options for managing the conditions.  
● Early intervention and community resources (e.g., parent support groups, therapeutic and recreational programs, interdisciplinary NICU follow-up programs).  
● Federal mandates, state eligibility policy, ethical standards, and local guidelines for early intervention services.  
● Practice guidelines of the APTA Section on Pediatrics for physical therapists working in early intervention.  
● Outcome measures to evaluate impairments, activity limitations, participation restriction, and family satisfaction.  
● Car seat safety requirements and postural support strategies for infants born preterm and at term.  
● Safety considerations in the use of infant toys and jumpers, and injury consequences from infant walkers in home environments.  
● Patterns of musculoskeletal malalignment and atypical movement associated with prolonged use of NICU equipment (respiratory, infusion, reflux wedges). |
physical therapy competencies were updated through a consensus process by a 3-member NICU Task Force of pediatric PTs with extensive neonatal expertise and geographical diversity, appointed by the Section on Pediatrics of the APTA. External review of the clinical competencies and algorithm was conducted by an additional expert panel of 5 pediatric PTs with neonatal expertise representing varying geographical regions of the United States. Further validation of the neonatal physical therapy competencies through a nation-wide practice analysis could provide an expanded framework for neonatology fellowship programs and for delineation of the practice.

**CLINICAL DECISION-MAKING ALGORITHM**

An algorithm for clinical decision making in neonatal physical therapy, revised from the 1999 algorithm,\(^2\) reflects the needs of contemporary practice and is outlined in Figures 1 to 3. Pathways for neonatal physical therapy management decisions are described for examination, evaluation, intervention, and re-examination with terminology compatible to the Guide to Physical Therapist Practice.\(^17\) The algorithm was modeled from the Hypothesis-Oriented Algorithm for Clinicians \(^11^8\) and II.\(^19\) The framework of the IFC\(^20\) adopted by the House of Delegates, APTA, 2008\(^21\) and the Synactive Theory of Development proposed by Al\(s\)^\(^22\) are embedded in this algorithm. The algorithm also provides a means for using evidence in decision making.

During the history taking process (Fig. 1), the primary care team and family identify strengths and challenges (PFSL) and decide on an examination strategy. On the basis of the observation of the infant’s activities, an infant strengths and challenges list is generated. The neonatal PT examines strengths and challenges (ISCL) at the body function and structure, activity, and participation levels of the ICF, which leads to the therapist’s strengths and challenges list (TSCL). All 3 strengths and challenges lists are merged and appropriate infant-centered/family-centered goals are then developed.

Before intervention (Fig. 2), the neonatal PT develops an intervention plan based on infant-centered/family-centered goals and implements this plan with respect to the cardiovascular/pulmonary and integumentary systems\(^17\) (autonomic system),\(^22\) the musculoskeletal and neuromuscular systems\(^17\) (motor behavior),\(^22\) behavioral state,\(^22\) and responsivity\(^10\) (attentional-interactive behaviors).\(^22\) The 4 categories are arranged according to (1) coordination, communication, and documentation such as supporting, developing, and promoting family/professional relationships; (2) education and consultation for family and primary care team such as training to support and promote the infant’s care, development/learning, health, nutrition, and safety; and (3) interventions provided by the PT, family, and members of the primary care team such as (a) use of adjunct accessories/or aids that support the infant in self-regulation of physiological state, promotion of smooth coordinated movement, and organization of movement including hand to mouth behavior for self-regulation of behavioral state.
### TABLE 5
Scientific Inquiry

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| Incorporate evidence-based literature into neonatal practice. | Review and critically analyze neonatal medicine, neonatal nursing, pediatric physical therapy, psychology, and neonatal respiratory therapy literature.  
- Identify mechanisms to effectively disseminate selected, current research related to neonatal physical therapy to NICU staff members and families.  
- Apply research and evidence-based practice literature into caregiving plans and interventions. | Literature searching procedures.  
- Steps for critiquing medical literature.  
- Levels of evidence from evidence-based medicine framework (Cochrane website, Oxford Center for Evidence-Based Medicine http://www.cebm.net/).  
- Administrative mechanisms for modifying clinical procedures or protocols on the basis of new research evidence. |

| Support or participate in research involving infants, parents, or caregivers in neonatal care units. | Create research questions on neonatal topics for clinical researchers.  
- Review the literature to identify related studies, establish a basis for the research questions and potential measurement methods, and evaluate designs and statistical methods used in similar studies.  
- Formulate testable hypotheses.  
- Establish and define independent and dependent variables.  
- Determine the research design and methods best suited to answer the research question.  
- Establish reliability in the use of the instruments chosen for data collection.  
- Analyze and interpret data.  
- Establish conclusions and clinical implications from the data.  
- Identify limitations of the study and suggestions for future research.  
- Disseminate results of the research. | Evidence-based practice concepts (principles and evidence hierarchy).  
- Research design and measurement methods.  
- Common statistical tests used in neonatal and pediatric physical therapy research.  
- Resources for consultation in design, statistical analysis, and funding.  
- Ethical principles governing research and protecting infant participants.  
- Institutional Review Board procedures for clinical research proposal approval and monitoring.  
- Research reporting mechanisms for presentations and publications. |

NICU indicates neonatal intensive care unit.

### TABLE 6
Clinical Education and Self-Learning/Professional Development

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<th>Roles</th>
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| Communicate, demonstrate, and evaluate neonatal physical therapy care processes with NICU professionals and other caregivers. | Identify learner knowledge and skill needs and prepare clinical training that reflects baseline and expected achievement levels.  
- Establish training objectives, priorities, and timeline.  
- Choose teaching methods and format.  
- Communicate information, demonstrate procedures, arrange practice sessions and repeat demonstrations, and provide feedback with learners on performance.  
- Evaluate learner performance and teaching effectiveness. | Scientific and theoretical bases and procedures in physical therapy for neonates.  
- Adult learning styles and stages of learning.  
- Educational processes to include objectives, methods, sequencing, and evaluation. |

| Pursue ongoing continuing education in practice topics related to neonatology. | Self-assess clinical competencies and knowledge limitations in physical therapy for neonates.  
- Evaluate and select continuing education options to address skill and knowledge deficit areas. | Self-reflection process.  
- Resources for seminars on neonatal care topics, NICU clinical training opportunities, and potential mentors with expertise in neonatology. |

NICU indicates neonatal intensive care unit.
## TABLE 7
Administration

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<th>Roles</th>
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| Plan and administer a neonatal physical therapy program | • Develop a mission and philosophy for the neonatal physical therapy program that is consistent with the missions and philosophy of the hospital and newborn medicine service.  
• Assess the service needs of the target neonatal population and establish criteria for neonatal physical therapy referral.  
• Select and assign priorities to the physical therapy procedures for neonates that will be offered.  
• Identify and acquire physical therapy resources for serving neonates, including PTs with precepted training, supplies, and time.  
• Establish financial support and develop or participate in developing a neonatal physical therapy service budget based on current staff resources and forecasted eligible neonatal population.  
• Develop and implement physical therapy policies and procedures for neonates including referral mechanism, intensity (frequency; duration), supervision and precepting processes, and documentation format and timelines.  
• Identify ethical and legal standards and incorporate them into neonatal physical therapy practice. | • Principles and sequences for developing and administering clinical programs.  
• Resource management principles for analyzing personnel, cost, and time requirements for neonatal physical therapy services.  
• Risk management principles and processes.  
• Leadership principles and supervision models.  
• Managed care processes and if applicable, contract negotiation strategies.  
• Code of ethics, standards of practice, and parameters of legal practice from the APTA and state health profession license boards. |
| Develop a physical therapy risk management program | • Document standard operating procedures for managing physiological risk during observation, infant examinations, and physical therapy services in the NICU.  
• Develop clinical protocols for high risk or unusual procedures (eg, extremity taping, soft tissue mobilization, neonatal hydrotherapy).  
• Establish procedures for managing inadvertent occurrences of adverse events during provision of physical therapy services in the NICU.  
• Delineate procedures for adverse event documentation, follow-up plan, and clinical teaching on analyzing and preventing the inadvertent occurrence. | • Normal and pathological ranges of physiological values and musculoskeletal parameters for infants at term and preterm gestational ages.  
• Environmental (physical and sociocultural) risk factors and their influence on the development of neonates.  
• Risk management models and principles. |
| Evaluate the effectiveness of a neonatal physical therapy program | • Evaluate and monitor quality of care and identify opportunities for practice change through reviews of cases and records with peers.  
• Evaluate and monitor clinical productivity.  
• Analyze effectiveness of interventions on infant and family functioning and participate in ongoing quality assurance/improvement initiatives in the NICU.  
• Determine evidence base for examinations and interventions implemented.  
• Conduct general review of physical therapy program with neonatal medical and nursing managers. | • Quality assessment/improvement models and methods for application to clinical caseloads and programs.  
• Program evaluation principles and methods.  
• Evidence-based practice concepts and principles.  
• Critical inquiry and evidence-based practice processes to evaluate neonatal and family interventions. |

APTA indicates American Physical Therapy Association; NICU, neonatal intensive care unit.
and (b) physical and social environment modifications such as dimming lights and decreasing noise to support physiological, motor, or behavioral stability and to promote infant/caregiver interaction during feeding in the NICU. Interventions are also directly provided by the neonatal PT. Direct physical therapy handling is a primary service provided by the neonatal PT to address impairments, activity limitations, and participation restrictions.
No direct physical therapy handling indicates that neonatal PTs should not engage in providing primary services to the infant.

The neonatal PT conducts re-examination (Fig. 3) to determine (1) changes in the infant’s status, (2) whether initial infant-centered/family-centered goals and outcomes were achieved, and (3) if not, to modify or redirect components of the intervention plan to achieve goals and outcomes. The clinical decision-making sequence as outlined in the algorithm not only affords the neonatal PT pathways for making evidence-based clinical decisions for the care of infants in the NICU but also provides the therapist with a framework to support clinical reasoning in neonatal physical therapy.

CONCLUSIONS

To guide the specialized practice of neonatal physical therapy, clinical training models have been presented and roles and proficiencies were outlined. A decision-making algorithm offers a flow chart for clinical reasoning. Before...
working in a neonatal unit, pediatric PTs must have precepted clinical training to develop refined skills in examining and intervening with fragile, vulnerable infants with structural, physiological, and behavioral vulnerabilities predisposing them to become unstable during routine procedures. Because each contact by the PT involves ongoing examination, interpretation, and modification or resequencing of procedures, the NICU is not an appropriate setting for PT assistants and aides and PT generalists and students. The potential to do harm with this vulnerable infant population must be recognized. A caring approach and good intentions do not substitute for focused, precepted clinical training in the range of competencies outlined for infant-centered and family-centered care. Instead, interested practitioners will benefit from structured, mentored competency-based training in neonatal physical therapy.

These guidelines may be used as a framework for developing competency training mechanisms for PTs entering neonatal practice, practitioners seeking more advanced levels of neonatal care competencies, and directors of pediatric residency and neonatology fellowship programs. In part II of the practice guidelines, theoretical frameworks and evidence-based practice recommendations will be delineated.
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