



Advanced Practice Nursing in Neonatology: Clinical Report

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Under Review: The American Academy of Pediatrics has identified sections of this report that require clarification regarding the description of APRN scope of practice for different neonatal care settings and patients. A revision will be published and linked to this page accordingly. In addition, shared attribution to the National Association of Neonatal Nurses (NANN) has been removed by request.

The participation of advanced practice registered nurses (APRNs) in neonatal care continues to be supported by the American Academy of Pediatrics. Traditionally, neonatal nurse practitioners and neonatal clinical nurse specialists were the two roles well established within the Neonatal Intensive Care Unit (NICU). With ongoing shortages of these roles, some institutions have turned toward pediatric nurse practitioners (acute and primary care) and family nurse practitioners to meet patient care needs. This clinical report aims to review the roles, scope of practice, collaboration, and credentialing of these categories of APRNs with recommendations for the safe and effective utilization of these providers in neonatal care. This clinical report will not address other roles in the NICU, including hospitalists or physician assistants in the NICU, nor speak to the potential shortages and solutions these professions are experiencing, as those topics are well covered in the Standards for Levels of Neonatal Care: II, III, IV and Neonatal Provider Workforce Technical Report.

INTRODUCTION

Advanced Practice Registered Nurses (APRNs) have served in the Neonatal Intensive Care Unit (NICU) for nearly 50 years. The Neonatal Clinical Nurse Specialist (NCNS) was one of the two APRN roles that filled a much-needed position of a neonatal nursing expert who facilitates education, patient advocacy, practice improvements, and quality initiatives.¹ The Board-Certified Neonatal Nurse Practitioner (NNP-BC) was the second APRN role, which started as a certificate program and has evolved over the last 40 years into a master's or doctoral-prepared, with a defined scope of practice, functioning provider caring for the full range of infants in all levels of newborn care. These two roles met many of the patient and family care needs in the nation's NICUs for decades, but recent changes have suggested

abstract

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the need for additional APRN roles in the NICU. Although neonatal physician assistants and pediatric hospitalists supplement the neonatal workforce, this report will focus on advanced practice nursing roles in the NICU.

According to the American Academy of Nurse Practitioners (AANP) Certification Board, there are more than 385 000 nurse practitioners (NPs) licensed in the US, and more than 39 000 new NPs completed their academic programs in 2021–2022. Neonatal and pediatric acute care comprise 1.1% of the total number of NPs by primary certification area.² These numbers support a relative shortage of APRNs in the NICU. There are several factors contributing to this shortage and the need for more APRN roles in the NICU. The first started in 2003, when the Accreditation Council for Graduate Medical Education (ACGME) reviewed and modified hospital resident physician hours, including significant limitations on how much time pediatric residents could spend in NICU rotations. This limitation of resident hours in the NICU shifted the workload onto neonatal APRNs, Neonatal Fellows, Neonatologists, and other providers such as pediatric hospitalists and physician assistants. This increased workload has persisted, with a report from 2021 showing that NNP-BCs work almost 250 extra hours a year beyond what they are contracted.³ The extra time and extra shifts have led to burn-out and fewer NNP-BC preceptors, creating a relative shortage of clinical placements for students, limiting enrollment.³ Additionally, between 2016 and 2021, NICU admissions increased by 2%, even though there was a 7% decrease in births.⁴ The increased workload, increased APRN positions to account for decreased resident hours, natural attrition patterns, and increased NICU admissions have resulted in a prolonged shortage of APRNs in the NICU.⁵

The American Academy of Pediatrics (AAP) endorses the role of the APRN.⁶ Current training and educational objectives for the NNP-BC were developed by the National Association of Neonatal Nurses (NANN).⁷ These guidelines are specifically designed to educate neonatal APRNs at the graduate level to manage well newborns, critically ill neonates, and convalescing infants to two years of age. With the recent shortage of neonatal APRNs in the NICU, many institutions have included the certified primary care pediatric nurse practitioner (CPNP-PC), certified acute care pediatric nurse practitioner (CPNP-AC), and certified or board-certified family nurse practitioner (FNP-C and FNP-BC) to augment the role of neonatal APRNs in providing care and medical management of premature and sick infants while hospitalized. However, training and certification for CPNP-PC, CPNP-AC, FNP-C, and FNP-BC are different from an NNP-BC (see Table 1: Education, Certification, and Training for APRNs), and this education alone does not ensure competency for CPNP-PCs, CPNP-ACs, FNP-Cs, and FNP-BCs to care for all neonatal patients. The purpose of this clinical report is to outline recommendations for the

scope of practice for APRNs in neonatal nursing and advanced care practices in the NICU.

Licensure, Accreditation, Certification, & Education (LACE)

In 2008, the APRN Consensus Work Group and the National Council of State Boards of Nursing APRN Advisory Committee published the LACE Consensus Model for APRN Regulation.⁸ LACE stands for licensure, accreditation, certification, and education and outlines the necessity of having these four elements in alignment to define and support the APRN scope of practice. For an APRN to practice safely, the patient population they care for 1) must have been covered in their formal academic education (by an accredited institution), 2) the APRN must pass a national board certification that includes testing of the knowledge on that patient population, and 3) the APRN be granted state licensure, which verifies that the individual has completed the necessary education, clinical training, and certification giving them the authority to practice in their specialty as outlined in the LACE guidelines. Furthermore, there are individual state nursing laws and rules that define the scope of practice for APRNs. The CNS (clinical nurse specialist) and CNP (certified nurse practitioner) are two types of APRNs that practice in the NICU and were identified in the LACE Consensus Model for APRN Regulation.⁸ All APRNs are required to complete a graduate-level education program of study and supervised practice beyond the level of the Registered Nurse (RN). However, there are different course requirements, clinical hours, and patient experiences to ensure the provider has trained appropriately in the corresponding neonatal or pediatric patient population. Although there are five APRN roles that can provide care to neonatal patients (see Table 2: APRN Roles in the NICU), the types and acuity of patients for whom each specific APRN can provide care is dependent upon the education, training, certification, and licensure required for each role, as described below.

DESCRIPTION OF ROLES AND SCOPE OF PRACTICE

Neonatal Clinical Nurse Specialist (NCNS)

An NCNS is a registered nurse with a Master's or Doctor of Nursing Practice (DNP) degree who, through study and supervised practice at the graduate level, has become an expert in the theory and practice of neonatal nursing. Completion of 500 (for masters) or 1000 (for doctorate) supervised clinical hours is required as part of the training, as well as certification by the American Association of Critical-Care Nurses (AACN).^{9,10} If the program is a post-baccalaureate practice doctorate program, there is an additional 500 clinical hours required for a total of 1000 clinical hours.¹⁰ An NCNS is poised to influence care by linking the individual domains of the patient, the nurse, and the

| TABLE 1. Education, Training, and Certification for APRNs | | | |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Role | Education and Description | Training | Certification |
| Neonatal Clinical Nurse Specialist (NCNS) | Master's or doctorate in theory and practice of neonatal nursing. | Master's program: 500 supervised clinical hours Doctorate program: 1000 clinical hours required | American Association of Critical-Care Nurses (AACN) |
| Board-Certified Neonatal Nurse Practitioner (NNP-BC) | Master's prepared or Doctor of Nursing Practice (DNP): minimum of 200 neonatal-specific didactic hours including neonatal pathophysiology, pharmacology, and neonatal assessment. ^{7,38,a} | Minimum 750 h of supervised clinical experience. Clinical experience in delivery rooms, level II-IV NICUs, follow-up and well-infant programs, (majority of the time in level III or IV NICUs) | National Certification Corporation (NCC) |
| Acute Care – Pediatric Nurse Practitioner (CPNP-AC) | Master's prepared or Doctor of Nursing Practice (DNP). Focus on children with or without unstable physiology. Training includes content on sepsis, chronic lung disease, and congenital heart lesions. | Pediatric-specific didactic hours plus a minimum of 750 supervised clinical hours. | Pediatric Nursing Certification Board® Certification does not contain content on fetal or preterm neonatal pathologies and physiology. |
| Primary Care - Pediatric Nurse Practitioner (CPNP-PC) | Master's prepared or Doctor of Nursing Practice (DNP). Focus on prevention, wellness, and continuous care of chronic conditions. Training in stabilization of acute and episodic conditions. Neonatal training includes newborn history and physical exam, breastfeeding, immunizations, and management of common newborn conditions. | Pediatric-specific didactic hours plus minimum of 750 supervised clinical hours. | Pediatric Nursing Certification Board® Certification does not contain content on fetal or preterm neonatal pathologies and physiology. |
| Certified Family Nurse Practitioner (FNP-C) Board-Certified Family Nurse Practitioner (FNP-BC) | Master's prepared or Doctor of Nursing Practice (DNP). Education is focused on health promotion, harm reduction, and disease prevention across the lifespan. Clinical experiences emphasize primary care concerns. The FNP-BC contains content on healthcare policy. | Pediatric-specific didactic hours (90) can count towards the minimum of 750 supervised clinical hours. *Note - pediatric clinical hours are not specific to neonates and all hours could be completed with adolescent patient population. | FNP-C – American Academy of Nurse Practitioners Certification Board® (AANP) FNP-BC – American Nurses Credentialing Center® (ANCC) |

^a Credentialed NNP-BCs who hold certificates or other non-master's degrees can continue to practice but should be encouraged to complete formal graduate education.

system, and is responsible for fostering continuous quality improvement in neonatal nursing care and developing and educating staff.^{8,9} Training for the NCNS includes core content in theory, clinical inquiry, leadership, systems thinking, quality improvement and safety, and evidence-based practice (EBP).¹⁰ The NCNS models expert nursing practice and applies and promotes EBP within a neonatal setting. The primary role of the NCNS is to influence direct patient care through education of competent nurses and influence for sound nursing practice in health care systems and organizations, although the role can also function to diagnose and treat states of illness, including direct patient care.^{8,10,11} In the NICU or Special Care Nursery (SCN) setting, collaborative practice between clinical nurse managers and the NCNS is essential in maintaining current practice guidelines and policies, which can be instrumental in obtaining

certifications such as The Joint Commission (JC), Magnet recognition, or Det Norske Veritas (DNV) programs.¹²

Board-Certified Neonatal Nurse Practitioner (NNP-BC)

A board-certified neonatal nurse practitioner (NNP-BC) is an experienced neonatal nurse with clinical expertise in neonatal nursing who has obtained a master's or DNP degree with supervised clinical experience in the management of newborn infants and their families. Some accelerated programs are designed to have the student complete the curriculum for the RN license and certification in the first year and then practice gaining experience while completing APRN coursework in the following years of the program. Education and clinical experiences address the care of infants with any pathology that may present at birth or during the neonatal period. NNP-BCs are nationally

| TABLE 2. APRN Roles in the NICU | | | |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Role | Patient Population | Neonatal Setting | Procedural Competencies |
| Neonatal Clinical Nurse Specialist (NCNS) | Birth to age two years old | Newborn Nursery Special Care Nursery NICU - levels I-IV | No required procedural competencies No direct patient care |
| Board-Certified Neonatal Nurse Practitioner (NNP-BC) | Birth to age two years old | Newborn Nursery Special Care Nursery NICU - levels I-IV Developmental Follow-up Clinic | <ul style="list-style-type: none"> • Resuscitation and stabilization • Endotracheal intubation • Laryngeal airway (LMA) placement • Umbilical vessel catheterization • Percutaneous arterial and venous catheterization • Arterial puncture • Lumbar puncture • Chest tube thoracentesis and needle aspiration • Exchange transfusion • Assisted ventilation • Other procedures with demonstrated education and competency (e.g., circumcision). |
| Acute Care – Pediatric Nurse Practitioner (CPNP-AC) | Care for children from birth to young adult May include infants who are ≥ 32 weeks, and conditions such as ^a : <ul style="list-style-type: none"> - respiratory distress - clinical sepsis - feeding discoordination due to prematurity - bronchopulmonary dysplasia (BPD) - congenital heart lesions | Newborn Nursery Special Care Nursery NICU - levels I-IV Developmental Follow-up Clinic | <ul style="list-style-type: none"> • Resuscitation and stabilization of term infants • Endotracheal intubation • LMA placement • Percutaneous arterial and venous catheters • Arterial puncture • Lumbar puncture • Intraosseous placement • Needle aspiration of pneumothorax • Chest-tube insertion and removal • Assisted ventilation • Other procedures with demonstrated education and competency (e.g., circumcision). |
| Primary Care - Pediatric Nurse Practitioner (CPNP-PC) | Care for children from birth to young adult May include infants who are ≥ 35 weeks with minor pathologies | Newborn Nursery Special Care Nursery NICU - levels I-IV Developmental Follow-up Clinic | Neonatal procedural competencies are outside the scope of practice as CPNP-PCs do not receive education and training for them. |
| Certified Family Nurse Practitioner (FNP-C) Board-Certified Family Nurse Practitioner (FNP-BC) | Can provide care for children from birth through adulthood May include infants who are ≥ 35 weeks with minor pathologies | Newborn Nursery Special Care Nursery NICU - levels I-IV Developmental Follow-up Clinic | Neonatal procedural competencies are outside the scope of practice as FNP-C/FNP-BCs do not receive education and training for them. |

^a This list is not inclusive.

board-certified to care for children from birth to age two.^{7,13} Some examples of disorders addressed in their education include prematurity, respiratory distress, necrotizing enterocolitis, congenital heart disease, chronic lung disease, and genetic abnormalities. The NNP-BC curriculum must include a minimum of 200 neonatal-specific didactic hours plus a minimum of 750 directly supervised clinical hours with critically ill neonates/infants, with a majority of the clinical hours in level III or IV NICUs.¹⁴ Clinical simulation may be used to augment the educational experience but does not count toward the 750 minimum clinical hour requirement. Training on neonatal procedures includes didactic content and simulation on resuscitation and stabilization, endotracheal intubation, administration of surfactant, laryngeal airway (LMA) placement, umbilical vessel catheterization, percutaneous arterial and venous catheterization, arterial puncture, lumbar puncture, chest tube

thoracentesis and needle aspiration, exchange transfusion, and assisted ventilation. Procedural confidence is developed through supervised clinical and simulation experiences, whereas competency is achieved beyond degree completion through the supervision of procedures by experienced colleagues and neonatologists as part of the credentialing process with the employer. Currently, credentialed NNP-BCs who have graduated from non-master's degree programs or certificate programs are preauthorized or "grandfathered in," meaning they can continue to practice in most states but should be encouraged to complete formal graduate education.¹⁵ The AAP supports the documented competency of the master's degree-prepared APRN for entry into practice as an NNP-BC.⁶ The AAP also supports APRNs who wish to pursue the highest level of educational preparation in nursing, either the Doctor of Philosophy (PhD) or the Doctor of Nursing Practice (DNP), but

recognizes that such degrees are not required for clinical practice. The PhD maintains a focus on advanced training in research, whereas the DNP maintains a focus on leadership and quality improvement; both are considered terminal degrees in nursing. In addition to patient care, the NNP-BC may also be responsible for educating staff, engaging in research, participating in quality improvement initiatives, and developing standards of nursing care.¹⁶

Acute Care Pediatric Nurse Practitioner (CPNP-AC)

An acute care pediatric nurse practitioner (CPNP-AC) is an experienced pediatric nurse with training in the management of acute, critical, and chronic pediatric health care illnesses, including emergent and life-threatening conditions.^{17,18} The CPNP-AC works closely with an interprofessional team to provide the highest level of evidence-based care for infants, children, adolescents, and young adults with life-threatening illnesses and organ dysfunction or failure. Young adult patients with chronic medical needs outside the traditionally defined pediatric age parameters may benefit from management by the CPNP-AC. In addition to preventative and health care maintenance, education and clinical experiences include preparation for congenital birth defects (eg, congenital heart disease), common acute childhood illnesses (eg, respiratory syncytial virus, strep throat), post-surgical care, trauma, and more. The CPNP-AC curriculum includes pediatric-specific didactic content plus a minimum of 750 directly supervised clinical hours.^{14,19,20} Clinical hours can be completed in acute care settings such as hospitals (including intensive care units), subspecialty clinics, and emergency departments. There is no requirement for a rotation in the NICU or newborn nursery as part of the clinical hours. Simulation or alternative clinical experiences (eg, community settings) cannot count in the required 750 hours, but may be counted above the 750 direct clinical hours.²⁰ Certification is achieved through the Pediatric Nursing Certification Board® and covers content on assessment, diagnosis, management, and the professional practice role; additionally, multiple clinical pathologies (respiratory, oncologic, endocrine, immunologic, metabolic, toxicology, etc.) are included as test content.¹⁸ The CPNP-AC also receives education and training on ventilator management and procedures, including airway management, central line placement, procedural sedation, chest tubes, and lumbar puncture. Employers wishing to deploy these providers in a neonatal setting are responsible for assessing initial and ongoing neonatal cognitive and procedural competency as part of the credentialing process.

Primary Care Pediatric Nurse Practitioner (CPNP-PC)

A primary care pediatric nurse practitioner (CPNP-PC) is an experienced pediatric nurse with advanced training in pediatric conditions. Some CPNP-PCs have nursing experience

prior to beginning an NP program, but given that it is not an application requirement, not all students enter the program with experience. Additionally, accelerated programs are designed to have the student complete the curriculum for the RN license and certification in the first year and then complete APRN coursework in the following two years, meaning they graduate without bedside nursing experience. CPNP-PCs receive didactic and clinical training focused on physiologic and psychological needs in children from birth to young adulthood. CPNP-PCs assess, screen, evaluate, and diagnose children from birth through young adults to provide the full spectrum of primary care health services. They prescribe a comprehensive therapeutic treatment plan, including pharmacological and non-pharmacological strategies, provide patient and family education, and refer patients to collaborative members of the health care team when indicated.²¹ The CPNP-PC curriculum includes pediatric-specific didactic hours plus a minimum of 750 directly supervised clinical hours.¹⁹ Clinical hours are outpatient and can include private practice, ambulatory, school-based clinics, home care, and subspecialty clinics. Clinical training in the NICU and newborn nursery can be included for interested students, but it is not part of the required curriculum. CPNP-PCs provide pediatric primary care in a variety of health care settings including, but not limited to, private practice, ambulatory and school-based clinics, the home, hospital, and subspecialty clinics. Patient management often focuses on prevention and medical continuity.²¹ Education on neonatal populations includes low-risk late preterm and term infants as well as long-term complications from prematurity that extend beyond the stay in the NICU. Training on neonatal procedures is not part of the standard CPNP-PC academic curriculum, but employers may wish to provide training and clinical experiences of neonatal procedures that fall within the scope of practice for a CPNP-PC. Employers are responsible for assessing ongoing cognitive and procedural competency in neonatal care as part of the credentialing process. Some examples of neonatal procedures performed by a CPNP-PC with additional training and credentialing could include resuscitation and stabilization (Neonatal Resuscitation Program), laryngeal mask airway (LMA) placement, and chest needle aspiration. The Pediatric Nursing Certification Board® administers the certifying exam for CPNP-PC, which covers content on health maintenance and promotion, assessment and diagnosis, management, and professional roles and responsibilities.²²

Certified Family Nurse Practitioner (FNP-C) and Board-Certified Family Nurse Practitioner (FNP-BC)

A certified family nurse practitioner (FNP-C) and a board-certified family nurse practitioner (FNP-BC) both have foundational nursing education and advanced training in the management of individuals and families across the

lifespan.¹⁹ The difference between the two designations is that the FNP-C emphasizes a focus on clinical practice, whereas the FNP-BC includes clinical practice, policy, and education. The FNP-C/FNP-BC can provide primary care for all patients, including prenatal, pediatric, adolescent, adult, and elderly primary care.^{19,23} Education for the FNP-C/FNP-BC is focused on health promotion, harm reduction, and disease prevention, and clinical experiences aim to include preparation for primary care concerns (eg, common childhood illnesses, hypertension, type II diabetes, etc.). An FNP-C/FNP-BC may or may not have nursing experience prior to being accepted into their graduate program. The FNP-C and FNP-BC curricula require a minimum of 750 directly supervised clinical hours but recognize that proper training to care for multiple age groups will far exceed this minimum. Of the 750 hours, only 90 are required in a pediatric setting, which is generally an outpatient setting. There is no requirement for clinical hours in the NICU or newborn nursery. Simulation or alternative clinical experiences (eg, community settings) can count for clinical experience beyond the required 750 hours.¹⁹ Certification for the FNP-C is achieved through the American Academy of Nurse Practitioners Certification Board® and covers content on assessment, diagnosis, management, and evaluation across multiple age groups as outlined above.²³ Certification for the FNP-BC is achieved through the American Nurses Credentialing Center (ANCC) and covers content on diagnosis, management, evaluation, and nursing policy. Both FNP-C and FNP-BC receive training on the following procedures: minor skin lesion removal, microscopy, Papanicolaou tests, joint aspirations and injections, skin biopsy, arterial puncture, therapeutic injections, wound closure, splinting, casting, and wound management. Training on neonatal procedures is not included in the curriculum. Additional procedures may be performed with proper training, evaluation, and credentialing by the employer. Employers wishing to utilize FNP-C/FNP-BCs in a neonatal setting are responsible for assessing initial and ongoing neonatal cognitive and procedural competency as part of the credentialing process.

Competency and Scope of Practice

Initial and ongoing competency for all types of nurse practitioners is defined by the National Organization of Nurse Practitioner Faculties (NONPF) and includes nine domains: Knowledge of Practice, Person-Centered Care, Population Health, Practice Scholarship and Translational Science, Quality and Safety, Interprofessional Collaboration in Practice, Health Systems, Technology and Information Literacy, Professionalism, and Personal, Professional and Leadership Development.^{24,25} Competency and scope of practice for NCNSs are defined by the National Association of Clinical Nurse Specialists (NACNS).¹⁰ Academic centers develop their curricula around the competencies; national

certification boards incorporate the competencies into their respective exams; and professional organizations use the competencies to develop policy statements. Therefore, all APRN roles that practice within the NICU follow either the NONPF or NACNS competency guidelines. Some roles have expanded the competency checklist to provide additional guidance to organizations assessing competency. The National Association of Neonatal Nurses (NANN), the professional organization for neonatal nurses and APRNs, applies the NONPF competency framework to the neonatal population for management by NNP-BCs.⁷ The NACNS has defined a separate competency framework for the management of neonates by NCNSs.¹⁰ Both include specific requirements such as maternal and fetal physiology for initial and ongoing practice.^{7,26} For CPNP-PC and CPNP-AC roles, the competencies are specific to the education, training, and certification of a pediatric nurse practitioner.¹⁶ For the FNC-C/FNP-BC roles, the competencies are broad and less specific (eg, pulmonary diseases). Competencies are aimed at creating a framework to ensure congruence with the APRN LACE Consensus Model, which aligns with the scope of practice for each role.⁸ However, each state has the ultimate responsibility of defining the legal scope of practice for APRN roles.

In the NICU, APRNs manage a variety of diseases as allowed by applicable scope of practice laws as governed by the state. To demonstrate the differences in scope of practice for the different APRN roles in the NICU, respiratory distress will be used as an example. NNP-BCs could manage respiratory distress syndrome (RDS), bronchopulmonary dysplasia (BPD), transient tachypnea of the newborn (TTN), persistent pulmonary hypertension (PPHN), and a pneumothorax in an infant of any gestational age because the education for an NNP-BC aligns with the clinical experiences and certification received. A CPNP-AC could manage RDS in the late preterm infant, convalescing BPD, TTN, and a pneumothorax in a late preterm or term infant (but not in a preterm infant <34 weeks). A CPNP-PC could manage term and late preterm infants with TTN, or a preterm infant now corrected to term with convalescing BPD but would not manage other respiratory pathologies in the NICU. An FNP-C/FNP-BC could similarly manage TTN in term and late preterm infants and convalescing BPD, as these would fall within their scope of practice.

SUPERVISION AND COLLABORATION

At the time of this publication, 29 states and territories grant NPs full practice authority,²⁷ meaning that an NP can legally provide inpatient and/or outpatient management and care within their scope of practice without a supervising or collaborating physician (see Table 3: Practice Authority by State). Reduced practice authority is present in 12 states/territories and allows the NP to perform parts of their role without a supervising or

| TABLE 3. Practice Authority by State | | |
|------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|
| Full Practice Authority^a (29 states) | Reduced Practice Authority^b (12 states) | Restricted Practice Authority^c (10 states) |
| Alaska | Alabama | California |
| Arizona | Arkansas | Georgia |
| Colorado | Illinois | Michigan |
| Connecticut | Indiana | Missouri |
| Delaware | Kentucky | North Carolina |
| District of Columbia | Louisiana | Oklahoma |
| | Mississippi | South Carolina |
| Florida | New Jersey | Tennessee |
| Hawaii | Ohio | Texas |
| Idaho | Pennsylvania | Virginia |
| Iowa | West Virginia | |
| Kansas | Wisconsin | |
| Maine | | |
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| New Hampshire | | |
| New Mexico | | |
| New York | | |
| North Dakota | | |
| Oregon | | |
| Rhode Island | | |
| South Dakota | | |
| Utah | | |
| Vermont | | |
| Washington | | |
| Wyoming | | |

^a Full practice authority is defined as the ability to practice without restriction to evaluation, diagnosis, management, and prescribing medications, including controlled substances.³⁹

^b Reduced practice authority includes a restriction on one or more of these elements and mandates a collaborative agreement with another health provider for the NP to practice.

^c Restricted practice includes a restriction on one or more elements and requires supervision by another health provider for the NP to practice.

collaborating physician. Restricted practice authority constrains the NP to work with a supervising or a collaborating physician for all patient care management and is a requirement in 10 states. In usual practice, the NNP-BC and NCNS roles includes patient management and education in collaboration with a physician, usually a pediatrician or neonatologist depending on the level of care provided in the NICU although the NCNS often practiced independently.¹⁰

Using the acquired knowledge from pathophysiology, pharmacology, and physiology, the NNP-BC may exercise independent judgment in the assessment, diagnosis, and management of infants and in the performance of credentialed procedures, under direct or indirect supervision of a neonatologist. In 2023, the AAP published Standards for Levels of NICU Care: II, III, IV which delineated national standards for training and supervision privileged care providers, including NNPs, in NICUs. Under these standards, Level III and IV NICUs must have a neonatologist as Medical Director, and if a neonatologist is not available on-site 24/7, there should be a policy in place which defines criteria and timeframe for on-site physician presence and supervision. In addition, privileged care providers in the NICU must complete annual continuing education specific to neonatology, with credentials reviewed by the medical director at least every two years. These standards are currently being adopted in many states.

WORKFORCE DIVERSITY

Enhancing representation among neonatal providers under-represented in the workforce can help address inequities and reduce outcome disparities.^{28,29} Differential neonatal care delivery can occur along a continuum of structural and process inequities such as, care in lower quality NICUs, lower likelihood to receive human milk, and less access to the benefits of innovation. Such inequities can lead to clinical complications and other outcome disparities.^{30–32} When gaps in care emerge, families have reported that bias and cultural incongruence often interfere with the ability to advocate for their infants. This is commonly experienced by families of color.³³ A more diverse neonatal provider workforce could potentially help address differential patient-family experiences rooted in bias, implicit or otherwise, and mitigate real, or perceived, outcome disparities.²⁸

Because APRNs need a minimum of a Master's degree to practice, successful completion of initial RN preparation at a BSN level and matriculation into graduate school is necessary. Yet, NP education has been shifting to eliminate the master's degree and prepare new NPs at the doctoral level, which could be a barrier to some applicants.³⁴ Barriers such as lack of financial resources, absence of access to role models, and inflexibility of program delivery can be influenced by targeted interventions to support nurses under-represented in the workforce to advance their education and practice. Policies and programs to support the success of NP students under-represented in the workforce and incentivize completion of graduate education, such as loan forgiveness or increased scholarships in underserved areas, could alter this imbalance to support broader workforce diversity.

CONCLUSION

The relative shortage of NNP-BCs and NCNSs in addition to the limitations of other providers (residents, fellows and attending staff) has created staffing challenges for many NICUs. Increased incentives for potential students (ie, loan forgiveness) and for training programs (ie, financial incentives for clinical training sites) are necessary to address this shortage. In the interim, institutions that have added CPNP-AC, CPNP-PC, and FNP-C/FNP-BC positions in the NICU need to ensure that education, training, and certification align with the population receiving care by the certification the APRN holds. The spectrum of duties performed by the neonatal APRN will vary among institutions, but a nationally defined scope of practice must remain a priority when APRNs provide care for neonatal patients. CPNP-ACs, CPNP-PCs, and FNP-C/FNP-BCs may complement the care provided by NNP-BCs and NCNSs. Their scope of practice includes late preterm, low acuity, and chronic care populations. This, in turn, allows the NNP-BC to care for higher acuity and extremely premature infants. Each of these Neonatal APRN roles requires advanced education and a master's degree (except for those who practiced prior to these requirements). Nationally recognized certification examinations and requirements for the maintenance of education also exist within each role.³⁵ Credentialing for practice is currently governed by individual states, and inpatient care privileges are granted by the individual institution. Each institution should develop a procedure for the initial granting and subsequent maintenance of privileges, ensuring that the proper professional credentials are in place and that nationally defined scope of practice and competencies are maintained. These procedures are best developed by the collaborative efforts of the nursing administration, APRNs, and the medical and APRN provider staff.

RECOMMENDATIONS

1. APRNs must practice within their scope of practice, which is defined by their state to ensure that education, training, and certification by a nationally recognized organization are in alignment with the provision of safe and effective care in a given patient population.⁸
2. CPNP-ACs, CPNP-PCs, and FNP-C/FNP-BCs may complement the care provided by NNP-BCs and NCNSs in the neonatal population. Their scope of practice includes late preterm, low acuity, and chronic care populations.
3. Medical care for patients in level III or IV newborn intensive care units may be provided by appropriately trained and credentialed APRNs, in collaboration with a neonatologist.
4. Medical care provided by the APRN for patients receiving level I and II care may be provided independently in collaboration with a physician with a special interest and experience in neonatal medicine, usually a pediatrician, family medicine provider, or neonatologist.
5. Determination of whether the APRN practices in collaboration with or under the direct supervision of a physician outside of the NICU setting (eg, independent billing in the newborn nursery) will be in accordance with the board of nursing regulations in the state in which the APRN is practicing.^{26,35}
6. Once certified, APRNs will need to maintain their certification through continuing education and periodic demonstration of competency skills checklists and practices.^{8,36}
7. The APRN should comply with hospital policy regarding credentialing and re-credentialing.³⁷
8. Employers and institutions providing APRN education may consider incentives and flexible program schedules to accommodate a more diverse student and provider population to decrease the disparities present in the current neonatal medicine workforce.

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ABBREVIATIONS

AACN: American Association of Critical-Care Nurses
AAP: American Academy of Pediatrics
AANP: American Academy of Nurse Practitioners

ANCC: American Nurses Credentialing Center
 ACGME: Accreditation Council for Graduate Medical Education
 APRN: Advanced Practice Registered Nurse
 BPD: Bronchopulmonary Dysplasia
 CNS: Clinical Nurse Specialist
 CNP: Certified Nurse Practitioner
 CPNP-AC: Certified Pediatric Nurse Practitioner - Acute Care
 CPNP-PC: Certified Pediatric Nurse Practitioner - Primary Care
 DNP: Doctorate in Nursing Practice
 DNV: Det Norske Veritas
 EBP: evidence-based practice
 FNP-BC: Family Nurse Practitioner - Board Certified
 FNP-C: Family Nurse Practitioner - Certified
 JC: Joint Commission
 LACE: Licensure, Accreditation, Certification, & Education

LMA: laryngeal airway
 NACNS: National Association of Clinical Nurse Specialists
 NANN: National Association of Neonatal Nurses
 NCNS: Neonatal Clinical Nurse Specialist
 NICU: Neonatal Intensive Care Unit
 NNP-BC: Neonatal Nurse Practitioner - Board Certified
 NONPF: National Organization of Nurse Practitioner Faculties
 NP: Nurse Practitioner
 PhD: Doctor of Philosophy
 PPHN: Persistent Pulmonary Hypertension of the Newborn
 RDS: Respiratory Distress Syndrome
 RN: Registered Nurse
 SCN: Special Care Nursery
 TTN: Transient Tachypnea of the Newborn

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