American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Standards for Levels of Neonatal Care: II, III, and IV

Ann R. Stark, MD, FAAP, DeWayne M. Pursley, MD, MPH, FAAP, Lu-Ann Papile, MD, FAAP, Eric C. Eichenwald, MD, FAAP, Charles T. Hankins, MD, MBA, FAAP, Rosanne K. Buck, RN, MS, NNP-BC, C-ONQS, Tamara J. Wallace, DNP, APRN, NNP-BC, Patricia G. Bondurant, DNP, RN, Nicole E. Faster, MSN, RN, RNC-NIC

OVERVIEW

Establishment of risk-appropriate care was first proposed in 1976 when leaders in perinatal health proposed a model system of regionalized care for obstetrical and neonatal patients, including definitions of graded levels of hospital care.[1] Risk-appropriate care, in which infants with mild to complex critical illness or physiologic immaturity are cared for in a facility with the personnel and resources appropriate for their needs and condition, results in improved outcomes. This concept is supported by the American Academy of Pediatrics (AAP) policy statement "Levels of Neonatal Care," which provides a review of data supporting a tiered provision of neonatal care and reaffirms the need for nationally consistent standards of care to improve neonatal outcomes.[2]

The work of the AAP NICU Verification Program began in 2013 when the state of Texas mandated that all Texas facilities caring for newborns required a neonatal level of care designation to receive Medicaid payment for neonatal services and announced a plan to engage survey agencies to verify levels of neonatal care. The AAP was identified as 1 of 2 Texas-approved survey agencies to pilot the verification survey process in 2016, and the NICU Verification Program was officially launched. Since 2016, the NICU Verification Program has provided third-party surveys by experienced and credentialed neonatologists, neonatal nurses, and pediatric surgeons to assess compliance with state-specific risk-appropriate neonatal care standards.

Since then, discussions were initiated with the Georgia Department of Public Health in 2019 to provide NICU verification surveys in Georgia. Additionally, the AAP NICU Verification Program is named as the approved neonatal survey agency for neonatal care services in Missouri's code of state regulations for neonatal care designation. The AAP continues to be approached by additional states and

This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.

The content of this publication may be cited in academic publications, as well as downloaded and printed for individual use only. These materials may not be distributed, resold, nor used to create revenue generating content, software, or programs by any entity other than the American Academy of Pediatrics without the express written permission of the American Academy of Pediatrics.

DOI: https://doi.org/10.1542/peds.2023-061957

Address correspondence to Ann R. Stark, MD, FAAP. Email: astark@bidmc.harvard.edu

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2023 by the American Academy of Pediatrics

To cite: Stark AR, Pursley DWM, Papile LA, et al. Standards for Levels of Neonatal Care: II, III, and IV. *Pediatrics*. 2023;151(6):e2023061957

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

independent facilities for verification services outside Texas, Georgia, and Missouri.

Although all states regulate health care facilities, specifications for levels of neonatal care and adherence to requirements vary widely.[3,4] Data indicate that facilities often assess themselves at a higher level than an independent observer, yet only a few states require verification by a third-party surveying agency or health department official. Recognizing that a national neonatal verification program is vital to high-quality and equitable care, the AAP NICU Verification Program has developed the "Standards for Levels of Neonatal Care: II, III, and IV," which have the potential to improve the quality and consistency of risk-appropriate neonatal care and is critical to the future growth of the AAP NICU Verification Program.

The AAP Standards for Levels of Neonatal Care are considered a complementary implementation tool as they are based on existing AAP policy; evidence-based literature; standards of professional practice from national neonatal, perinatal, and surgical organizations; published data; and, when no data existed, expert opinion. Developed by the AAP NICU Verification Program Leadership Team with the support of AAP staff, the Standards codify the minimum components of care expected for each level of neonatal care from Special Care Nursery (Level II), to complex subspecialty care including surgery (Level IV NICU). The NICU Verification Program also convened a virtual stakeholder meeting in September 2020, which included national leaders in neonatal intensive care, neurodevelopmental follow-up care, pediatric surgery, and quality and patient safety. The Section on Neonatal-Perinatal Medicine (SONPM) Clinical Leaders Group (CLG) and Follow-up Group provided additional input to the Standards, and published standards from nursing, pediatric surgery, and therapist organizations have been integrated as well.

The lack of standardized or state-specific risk-appropriate neonatal care policies is a barrier to the delivery of regulated and high-quality neonatal care. By establishing and implementing risk-appropriate neonatal care standards, the NICU Verification Program believes that the AAP will improve neonatal outcomes by ensuring that every infant receives care in a facility with the personnel and resources appropriate for the newborn's needs and condition. Although the Standards are identified as minimum requirements for each level of neonatal care, the AAP NICU Verification Program encourages facilities to go beyond the minimum. The AAP NICU Verification Program upholds the AAP Equity Agenda and is committed to supporting efforts to improve health outcomes by encouraging facilities to further assess the health disparities of their patients, families, and community. The AAP values equity, diversity, and inclusivity and recognizes that family-centered care is essential for best outcomes and encourages facilities to amplify their focus on family members and staff to elevate the quality of neonatal care and improve the health outcomes of the nation's most vulnerable population.[3,4]

The AAP "Standards for Levels of Neonatal Care II, III, and IV" (the "Standards") were developed through the cooperative efforts of the AAP NICU Verification Program Leadership Team and the Committee on Fetus and Newborn (COFN), the SONPM, and the SONPM CLG. The Standards delineate the components of care expected for each level of neonatal care from Special Care Nursery (Level II), to complex subspecialty care including surgery (Level IV NICU) by setting forth standards for institutional commitment, neonatal programing, personnel, ancillary services, patient and family care resources, and equipment required for each level of neonatal care. Compliance with the Standards will not guarantee that a particular neonatal program is in compliance with applicable state law or other requirements. In addition, the Standards are not designed to be an educational resource for clinicians related to treatment decisions or standards of patient care. Rather, the Standards set forth the minimum components to be included in any neonatal program desiring to be recognized as providing a particular level of neonatal care.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

STANDARD I: INSTITUTIONAL COMMITMENT

(a) The facility's organized medical staff and institutional governing body must demonstrate an institutional commitment to the neonatal program and will:
1. include a commitment of the facility's governing body supporting the level-specific provisions of neonatal services as described in the neonatal program description;
2. include allocation of sufficient personnel and resources to attain optimal neonatal care;
3. reaffirm the neonatal program at least every 3 years; and
4. verify the neonatal program description is current at the time of neonatal verification.

STANDARD II: NEONATAL PROGRAM DESCRIPTION

(a) The facility will provide a detailed description of the neonatal services provided that includes a comprehensive explanation of the scope of services available to all neonatal and obstetrical patients that is consistent with accepted professional standards of practice and clinical care; defines the neonatal population served; and supports the health, safety, and optimal care of all patients.
1. The comprehensive description of neonatal services will include, at a minimum:
   i. identification of the resources used to develop the facility's neonatal policies and procedures for the neonatal services it provides;
   ii. description of the review and revision schedule for all neonatal medical practice guidelines, neonatal nursing policies, and ancillary care team policies that does not exceed 3 years;
   iii. written guidelines for consultation, triage, stabilization, and transfer of newborns and/or pregnant or antepartum persons who receive care at the facility;
   iv. provisions to facilitate continuity of care for high-risk neonatal patients from delivery to discharge;
   v. delineation of roles, responsibilities, and authority of the medical, nursing, and ancillary patient care directors;
   vi. physician, advanced practice nurse, and/or other medical care provider staffing plan for neonatal coverage;
   vii. plan for nurse staffing including provisions for flexibility and change in census and acuity;
   viii. completion of an annual educational needs assessment to evaluate the ongoing educational needs of all staff participating in the care of newborns;
   ix. annual educational plan for all staff participating in the care of newborns that includes didactic education, simulation, competency, and skills validation;
   x. appropriate allocations for family-centered care including providing parents with reasonable access to their infants and encouraging advocacy, shared decision-making, and participation in their child's care;
   xi. assurance of equitable care for all neonatal patients and families and provisions for promoting an environment of cultural humility;
   xii. capability of neonatal care team members to have the knowledge and skills to provide lactation support;
   xiii. a process to assess and establish appropriate on-going care for all newborns after discharge;
   xiv. a description of the Neonatal Patient Safety and Quality Improvement Program (NPSQIP); and
   xv. established evacuation policies and procedures to guarantee that obstetrical and neonatal patients receive, or are transferred to, the appropriate level(s) of care.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

STANDARD III: NEONATAL PATIENT SAFETY AND QUALITY IMPROVEMENT PROGRAM (NPSQIP)

NPSQIP Core Components:

(a) The facility will have a system for identification and review of significant events that could indicate threats to patient safety, with a goal of learning from identified events and mitigating future risk of recurrence, including:
   1. a list of specific triggers or safety indicators that warrant a record review, with the goal of identifying significant safety events such as errors, adverse events, near misses, complications, and mortalities;
   2. a process for systematic multidisciplinary review of selected cases or safety events, using acceptable failure mode and effect analysis tools with a goal of identifying interventions to improve systems and reduce future safety risks; and
   3. a process for monitoring the implementation of identified interventions.

(b) The facility will have a dashboard or equivalent that is used to summarize and track quality indicators relevant to newborn care, including:
   1. a list of selected quality measures relevant to the facility with a process for obtaining data needed for each selected neonatal quality measure;
   2. a platform to display performance on the selected quality measures, including a process for updating data with a frequency that allows for appropriate identification of performance concerns;
   3. benchmarking of performance, when possible, with internal or external benchmarks; and
   4. a multidisciplinary forum for review of the dashboard or equivalent.

(c) The facility will have a structured approach to quality improvement (QI) that seeks to improve care quality and outcomes.[5] Quality outcomes include care that is safe, efficient, effective, timely, equitable, and patient centered.[6] Approaches will include:
   1. a clear process for determining current QI initiatives, with a goal that the unit is engaged in at least 1 to 2 such initiatives at any given time;
   2. identification of a multidisciplinary QI team for each initiative, with a designated team lead;
   3. use of structured improvement methods or framework to guide improvement efforts; and
   4. a multidisciplinary quality committee that meets regularly to identify and review QI initiatives.

(d) The facility will maximize efforts to standardize and improve care through the use of guidelines and policies that align with research-driven and evidence-based best practices, including:
   1. a process for identifying topics for guideline or policy development;
   2. a process for developing guidelines and policies that incorporate evidence-based recommendations;
   3. a platform for making guidelines and policies readily available to clinical providers; and
   4. a process for periodic review of guidelines and policies to guarantee they remain updated, and evidence based.

(e) The facility will have multidisciplinary involvement in quality and safety activities, including:
   1. involvement of all disciplines represented in the neonatal quality and safety activities as appropriate and as described above; and
   2. for level IV facilities, involvement of subspecialty services with significant presence in the neonatal unit.

(f) The neonatal-specific unit will coordinate with hospital quality and safety activities, including:
   1. structured collaboration with the obstetrics and pediatric surgery departments, if applicable, to identify and implement opportunities for shared quality and safety efforts;
   2. participation in hospital-level quality and safety activities to confirm alignment of neonatal quality goals with hospital priorities;
   3. alignment with hospital activities and reporting of quality measures to national organizations; and
   4. participation in efforts to guarantee everyday readiness for external assessments by regulatory organizations.

(g) The facility will participate in larger communities of perinatal safety and quality, including:
   1. collaboration between transferring and receiving hospitals to examine and improve population-level quality and safety through structured activities such as transport review and sharing of clinical protocols; and
   2. for level III and IV facilities, participation in regional, state, or national databases that allows benchmarking of performance.

NPSQIP Additional Best Practices:

(h) Encourage and support the integration of family into quality improvement and patient safety initiatives.

(i) Explicit efforts to identify inequities and target equity in quality measures.

(j) A process for random chart audits and peer review.

(k) Neonatal team training for safety and Just Culture.

STANDARD IV: GENERAL PROGRAM REQUIREMENTS

Family-Centered Care Core Components:

(a) The facility will:
   1. allow all parents to have reasonable access to their infants at all times;
   2. have access to the services, personnel, and equipment needed to provide the appropriate level of care for all infants;
   3. support the physiologic, developmental, and psychosocial needs of infants and their families;
   4. have a process to screen every family for social determinants, depression, and cultural needs; and
   5. refer patients and families to appropriate resources as needed.

Family-Centered Care Additional Best Practices:

(b) Implement the utilization of primary nursing.

(c) Involve family in daily and multidisciplinary patient care rounds.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

(d) Implement and support a family advisory council.
(e) Establish a process to evaluate potential health disparities of the patient population served.
(f) Implement a coordinated process to assess and address the emotional needs of families.
(g) Engage in shared decision-making by involving family in discharge planning, including transport discussions.
(h) Provider and staff training on shared decision-making and how to engage in difficult and inclusive conversations.
(i) Explicit efforts to support lactation and the needs of breastfeeding[a] individuals.

Lactation and Neonatal Nutrition

(j) The facility will:
1. have personnel with the knowledge and skills to support lactation available at all times;
2. have pumping equipment and secure human milk storage facilities available;
3. have policies and procedures in place to support:
   i. the initiation and maintenance of lactation;
   ii. early initiation of milk expression;
   iii. safety, preparation, storage, and use of human milk and formula;
   iv. long-term pumping and transition to breastfeeding; and
   v. the utilization of donor human milk, if available.
4. provide annual education to all direct care providers on the importance of, and support of lactation (ie, pumping, mixing, safe storage, misappropriation, and proper identification); and
   i. all direct care providers have didactic education, skills verification, and competency on the proper mixing of human milk and formula;
5. establish a program for breastfeeding and lactation support, including data collection.

Neonatal Resuscitation

(i) The facility must have written policies and procedures specific to the resuscitation and stabilization of newborns based on current standards of professional practice.[7]
1. At least 1 person with the skills to perform a complete neonatal resuscitation including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately available on-site 24/7.[7]
2. A full range of neonatal resuscitative equipment, supplies, and medications must be immediately available at all times.[7]
3. If the facility provides obstetrical delivery services:
   i. Each birth will be attended by at least 1 AAP Neonatal Resuscitation Program (NRP) trained provider whose only responsibility is the management of the newborn and initiating resuscitation.[7]
   ii. In the event of identified antepartum and intrapartum risk factors, at least 2 NRP trained providers should be present at birth and be responsible solely for the management and resuscitation of the newborn.[7] Additional qualified providers should be available depending on the anticipated risk, number of newborns, and the obstetrical setting.[7]
   iii. If advanced resuscitation measures are anticipated, a fully qualified neonatal resuscitation team should be present at the time of birth.[7]

Radiology

(j) When obtaining imaging in neonatal and obstetrical patients, radiology services will incorporate the "as low as reasonably achievable" principle.[8]

Policies and Procedures

(k) The facility will have written:
1. neonatal, medical, and ancillary care guidelines, policies, and procedures that are established on evidence-based literature, and best-practice standards, that are monitored and tracked for adherence, reviewed at least every 3 years, and revised as needed;
2. a policy that mandates the escalation of concern and the urgent presence of a privileged care provider at the bedside, including a method to track adherence;
3. policies and procedures that define the criteria for neonatal team presence at a delivery and identify a method to track adherence, if applicable;
4. policies and procedures for the triage, stabilization, and transfer of obstetrical patients to the appropriate level of care, if applicable;
5. policies and procedures for consultation by telehealth and telephone, if applicable;
6. policies and procedures for intrafacility and interfacility neonatal transport;
7. policies and procedures for transfer to a higher level of neonatal care or for services not available at the facility, if applicable;
8. policies and procedures for car seat safety observation before discharge; and
9. policies and procedures for disaster response, including evacuation of obstetrical and neonatal patients to the appropriate level(s) of care.

Staff Privileges

(l) The facility will have:
1. specified requirements for all privileged care providers participating in the care of neonatal patients, and have a credentialing process for delineation of privileges;
2. a process to verify that all ancillary care services, clinical staff, and support staff have relevant neonatal training and expertise; and
3. a mechanism in place for medical, nursing, and ancillary care leadership to review and approve these credentials and track adherence.

[a] The word chestfeeding may be used by nonbinary, transgender, and other parents to identify how they feed their infants. It may refer to human milk or human milk substitute feeding, from a person who lactates or not. Because of this broad and variable definition, chestfeeding and breastfeeding are not always synonymous, and the words are not interchangeable. Published literature findings on breastfeeding may not hold the same outcomes for chestfeeding. Throughout this document, the words breastfeeding and human milk will be used.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

STANDARD V: LEVEL II SPECIAL CARE NURSERY (SCN) REQUIREMENTS

Level II SCN Requirements

(a) The Level II SCN will provide comprehensive care of infants born ≥32 wk or with birth wt ≥1500 g who[2]:
1. are mild to moderately ill with physiologic immaturity or who have conditions that are expected to resolve quickly[2];
2. are not anticipated to require subspecialty services on an urgent basis[2];
3. require continuous positive airway pressure (CPAP) or short-term (less than 24 h) conventional mechanical ventilation for a condition expected to resolve rapidly or until transfer to a higher-level facility is achieved[2]; or
4. are back transferred from a higher-level facility for convalescent care.[2]

Neonatal Medical Director

(b) The neonatal medical director (NMD) will:
1. be a board eligible or certified neonatologist or a board-certified pediatrician with sufficient training and expertise to assume responsibility of care for infants who require level II care, including endotracheal intubation, assisted ventilation, and CPAP management, or equivalent[5];
   i. if the neonatologist or pediatrician is certified by The American Board of Pediatrics, they will meet maintenance of certification (MOC) requirements;
2. complete annual continuing medical education (CME) specific to neonatology; and
3. demonstrate a current status of NRP completion.

Neonatologists

(c) If the NMD and/or on-site provider is not a neonatologist, the privileged care provider must maintain a consultative relationship with a board certified or eligible neonatologist at a higher-level neonatal facility; and
1. the facility must have a written policy or guideline that defines the criteria for neonatologist consultation at a higher-level neonatal facility.

Privileged Care Providers

(d) Privileged care providers with pediatric- or neonatal-specific training qualified to manage the care of infants with mild to moderate critical conditions, including emergencies, will[5]:
1. be continuously available on-site, or on-call and available to arrive on-site within an appropriate time frame as defined by the facility's policies and procedures;
   i. if the on-site or on-call provider is not a physician, a written policy will be in place that defines the criteria for notification and time frame for on-site physician presence, and a tracking mechanism for compliance is required;
   ii. if an infant is maintained on a ventilator, a pediatric- or neonatal-specific privileged care provider who can manage respiratory emergencies will be immediately available on-site;
2. demonstrate a current status of NRP completion;
3. complete annual continuing education requirements specific to neonatology; and
4. have credentials reviewed at least every 2 years by the NMD.

(e) At least 1 person with the skills to perform a complete neonatal resuscitation including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately available on-site 24/7[7]; and
1. demonstrate a current status of NRP completion.

(f) The facility will establish a written policy for backup privileged care provider coverage that establishes flexibility for variable census and acuity. This policy will document the criteria for notification and time frame for on-site presence, be based on allocating the appropriate number of competent medical providers to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9]

Nursing Leadership

(g) The level II SCN nurse leader will:
1. be a registered nurse (RN) with experience and training in perinatal nursing and neonatal conditions, with nursing certification preferred[5];
2. have at least a Bachelor of Science in Nursing, Master's preferred;
3. demonstrate a current status of NRP completion;
4. have sufficient experience and expertise to create, and/or support, a program that provides care to infants who require level II SCN care;
5. be responsible for inpatient activities in the level II SCN and, as appropriate, obstetrical, well newborn, and/or pediatric units;
6. coordinate with respective neonatal, pediatric, and obstetric care services, as appropriate;
7. provide oversight of annual neonatal-specific education, which includes low-volume, high-risk procedures consistent with the care provided in the level II SCN; and
8. foster collaborative relationships with multidisciplinary team members, facility leadership, and higher-level facilities to create a diverse, equitable, and inclusive environment focused on the quality of care and patient care outcomes.[5]

Clinical Nurse Staffing

(h) A written nurse staffing plan is in place that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RNs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9,10]

Clinical Nurse Staff

(i) Each clinical nurse will:
1. be an RN, with nursing certification specific to the care environment preferred;
2. demonstrate a current status of NRP completion;
3. participate in annual simulation and skills verification, which includes low-volume, high-risk procedures consistent with the types of care provided in the level II SCN; and

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

4. promote a family-centered approach to care, including but not limited to skin-to-skin care, appropriate developmental positioning based on gestational age, lactation and breastfeeding support, and engagement of families in their infant's care.

(j) If the facility utilizes licensed practical nurses (LPNs) or nonlicensed direct care providers to support the clinical nursing staff, the facility must:
1. have written criteria that define the LPNs' or nonlicensed direct care providers' scope of neonatal care;
2. provide annual education specific to the care of the neonatal population served; and
3. have a written staffing plan that establishes collaborative work assignments in accordance with the facility's policies and procedures.

Nursing Orientation and Education

(k) Level II SCN nursing orientation will incorporate didactic education, simulation, skills verification, and competency and will be tailored to the individual needs of the nurse based on clinical experience.[9]

(l) The facility will document an annual educational needs assessment to determine the educational needs of the clinical nursing staff and ancillary team members.

(m) Annual nursing education will address the annual needs assessment and incorporate simulation and skills verification of low-volume, high-risk procedures consistent with the types of care provided in the level II SCN and include education related to serious safety events.

Clinical Nurse Educator

(n) The level II SCN clinical nurse educator or perinatal nurse educator will:
1. be an RN, with nursing certification specific to the care environment preferred;
2. have at least a Bachelor of Science in Nursing, Master's preferred;
3. demonstrate a current status of NRP completion;
4. cultivate collaborative relationships with the neonatal nurse leader and facility leadership to improve the quality of care and patient care outcomes[5]; and
5. have experience and expertise to evaluate the educational needs of the clinical staff, develop didactic and skill-based educational tools, oversee education and skills verification, and evaluate retention of content, critical thinking skills, and competency relevant to level II neonatal care.[9]

(o) The facility will have a dedicated individual with sufficient time allocated to perform the roles and responsibilities of the clinical nurse educator.

Neonatal Transport

(p) The facility will have policies and procedures in place to identify a local neonatal transport program to facilitate neonatal transport to a higher-level neonatal facility.

Pediatric Medical Subspecialists and Pediatric Surgical Specialists

(q) Policies and procedures will be in place for referral to a higher level of neonatal care when pediatric medical subspecialty or pediatric surgical specialty consultation and/or intervention is needed.

Laboratory Services

(r) Laboratory services will have:
1. laboratory personnel on-site 24/7;
2. the ability to determine blood type, crossmatch, and perform antibody testing;
3. a blood bank capable of providing blood component therapy and irradiated, leukoreduced or cytomegalovirus (CMV)-negative blood;
4. the ability to perform neonatal blood gas monitoring; and
5. the ability to perform analysis on small volume samples.

(s) Low-volume specialty laboratory services may be provided by an outside laboratory, but the facility will have policies and procedures in place to verify timely and direct communication of all critical value results.

Pharmacy

(t) The facility will have at least 1 registered pharmacist with experience in neonatal and/or pediatric pharmacology who will:
1. be available for consultation on-site, or by telehealth or telephone, 24/7;
2. complete continuing education requirements specific to pediatric and neonatal pharmacology; and
3. participate in multidisciplinary care, as needed.

(u) The pharmacy will have policies and procedures in place to address drug shortages and to verify medications are appropriately allocated to the level II SCN; and
1. have policies and procedures in place to verify neonatal competency for pharmacy staff supporting and preparing medications for neonatal patients.

Diagnostic Imaging

(v) Radiology services will have:
1. appropriately trained radiology personnel continuously available on-site to meet routine diagnostic imaging needs and to address emergencies;
2. personnel appropriately trained in ultrasonography, including cranial ultrasonography, on-call and/or available on-site to perform advanced imaging as requested; and
3. the ability to provide timely imaging interpretation by radiologists with pediatric expertise as requested.

Respiratory Therapy

(w) The respiratory care leader will:
1. be a full-time respiratory care practitioner, with neonatal and pediatric respiratory care certification preferred;
2. have sufficient time allocated to oversee the respiratory therapists (RTs) who provide care in the level II SCN;
3. provide oversight of annual simulation and skills verification, which includes neonatal respiratory care modalities and low-volume, high-risk neonatal respiratory procedures;
4. develop a written RT staffing plan that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RTs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adherence and to verify respiratory therapy staffing is adequate for patient care needs[9]; and

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

5. maintain appropriate staffing ratios for infants receiving supplemental oxygen and positive pressure ventilation.

(x) Respiratory care practitioners assigned to the SCN will:
1. be a respiratory care practitioner with documented experience and training in the respiratory support of newborns and infants, with neonatal or pediatric respiratory care certification preferred;
2. be on-site 24/7 and immediately available when an infant is supported by assisted ventilation or CPAP;
3. be able to attend deliveries and assist with resuscitation as requested;
4. demonstrate a current status of NRP completion;
5. participate in annual simulation and respiratory skills verification, which includes low-volume, high-risk procedures consistent with the types of respiratory care provided in the SCN; and
6. have their credentials reviewed by the respiratory care leader annually for adequacy and adherence.

Dietitian

(y) The facility must have, or have the ability to consult with, at least 1 registered dietitian or nutritionist who has specialized training in neonatal nutrition, who will[5]:
1. collaborate with the medical team to establish feeding protocols, develop patient-specific feeding plans, and help determine nutritional needs at discharge;
2. establish policies and procedures to verify proper preparation and storage of human milk and formula; and
3. have policies and procedures for dietary consultation for patients in the SCN.

Neonatal Nutrition

(z) The facility will:
1. provide a specialized area or room, with limited access and away from the bedside, to accommodate mixing of formula or additives to human milk[5];
2. develop standardized feeding protocols for the advancement of feedings based on the availability of, and family preference for human milk, donor human milk, fortification of human milk and formula; and
3. have policies and procedures in place for accurate verification and administration of human milk and formula, and to avoid misappropriation.

Lactation and Breastfeeding Support

(aa) The facility will:
1. have personnel with the knowledge and skills to support lactation available at all times;
2. have a certified lactation counselor (CLC), international board-certified lactation consultant (IBCLC) preferred, available for on-site consultation on weekdays and accessible by telehealth or telephone 24/7; and
3. operationally review CLC and/or IBCLC personnel on an annual basis to establish adequately trained lactation coverage based on the specific need and volume of the neonatal population served.[11]

Neonatal Therapists

(bb) If the facility does not have in-house access to neonatal therapy expertise, the facility will have a formal process in place for providing on-site consultative services by qualified neonatal therapists to address the 6 core practice domains (environment, family or psychosocial support, sensory system, neurobehavioral system, neuromotor and musculoskeletal systems, and oral feeding and swallowing) and to provide the appropriate care for the neonatal population served. The facility will have on-site access to the following as needed[12]:
1. an occupational or physical therapist with neonatal expertise, and neonatal therapy certification preferred[5]; and
2. at least 1 individual skilled in the evaluation and management of neonatal feeding and swallowing concerns, with neonatal therapy certification preferred.[5]

(cc) The facility will operationally review neonatal therapist personnel on an annual basis to maintain adequate multidisciplinary neonatal therapist coverage based on the specific need and volume of the neonatal population served.[12]

Social Worker

(dd) The SCN social worker will:
1. be a Master's prepared medical social worker with perinatal and/or pediatric experience.[5]

(ee) The facility will:
1. provide 1 social worker for every 30 beds providing level II neonatal care and/or specialty and subspecialty perinatal care[5];
2. have a written description that clearly identifies the responsibilities and functions of the SCN social worker; and
3. have social services available for each family with an infant in the SCN as needed.

Pastoral Care

(ff) Personnel skilled in pastoral care will be available as needed and by family request, and will represent, or have the ability to consult, multiple religious affiliations representative of the population served.[5]

Retinopathy of Prematurity

(gg) If the facility back transfers infants for convalescent care, the facility must have a process in place to appropriately identify infants at risk for retinopathy of prematurity to guarantee timely examination and treatment by having[13]:
1. documented policies and procedures for the monitoring, treatment, and follow-up of retinopathy of prematurity[5,13]; and
2. the ability to perform on-site retinal examinations, or off-site interpretation of digital photographic retinal images, by a pediatric ophthalmologist or retinal specialist with expertise in retinopathy of prematurity, if needed.[5,13]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Discharge and Follow-up

(hh) Systems will be in place to establish preparation for SCN discharge, including postdischarge follow-up by general and subspecialty pediatric care providers, home care arrangements and community service resources, and enrollment in a developmental follow-up program as needed.
   1. The facility will:
      i. have written medical, neurodevelopmental, and psychosocial criteria that automatically warrant high-risk neonatal follow-up with appropriate developmental follow-up services; and
      ii. have a written referral agreement with a developmental follow-up clinic or practice, when possible, to provide neurodevelopmental services for the neonatal population served.

STANDARD VI: LEVEL III NICU REQUIREMENTS

Level III NICU Requirements

(a) The Level III neonatal facility will:
   1. provide comprehensive care for infants born at all gestational ages and birth weights, with mild to complex critical conditions or medical problems requiring sustained life support, hemodynamic support, and/or conventional mechanical ventilation[2];
   2. have the ability to provide high-frequency ventilation, inhaled nitric oxide (iNO) delivery, and/or therapeutic hypothermia or have policies and procedures in place to facilitate neonatal transfer to a higher level of care[2];
   3. provide care for infants who are back transferred for convalescent care[2]; and
   4. have sufficient experience based on patient volume and a systematic process to assess the quality of care provided to each very low birth weight infant, including a method to track specific quality indicators including obstetrical and neonatal transfers, review aggregate data using accepted methodology, and develop action plans as needed to improve patient outcomes.[2,14]

Neonatal Medical Director

(b) The NMD will:
   1. be a board eligible or certified neonatologist or equivalent;
      i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine;
   2. complete annual continuing CME specific to neonatology; and
   3. demonstrate a current status of NRP completion.

Neonatologists

(c) The NICU neonatologists will:
   1. be a board eligible or certified neonatologist or equivalent;
      i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine;
   2. complete annual CME specific to neonatology;
   3. demonstrate a current status of NRP completion;
   4. have credentials that are reviewed by the NMD at least every 2 years; and
   5. preferably be on-site and immediately available 24/7 or on-call and available to arrive on-site within an appropriate time frame, as defined by the facility's policies and procedures.
      i. If a neonatologist is not on-site 24/7, a written policy will be in place that defines the criteria for notification and time frame for on-site presence, and a tracking mechanism for compliance is required.

Privileged Care Providers

(d) Privileged care providers with neonatal-specific training qualified to manage the care of infants with mild to complex critical conditions, including emergencies, will be on-site 24/7 and[5]:
   1. demonstrate a current status of NRP completion;
   2. complete annual continuing education requirements specific to neonatology; and
   3. have their credentials reviewed at least every 2 years by the NMD.

(e) At least 1 person with the skills to perform a complete neonatal resuscitation, including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately available on-site 24/7[7]; and
   1. demonstrate a current status of NRP completion.

(f) The facility will establish a written policy for backup privileged care provider coverage that establishes flexibility for variable census and acuity. This policy will document the criteria for notification and time frame for on-site presence, be based on allocating the appropriate number of competent medical providers to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9]

Nursing Leadership

(g) The level III NICU nurse leader will:
   1. be an RN with experience and training in neonatal nursing and conditions, with nursing certification preferred[5];
   2. have at least a Bachelor of Science in Nursing, Master's preferred;
   3. demonstrate a current status of NRP completion;
   4. have sufficient experience and expertise to create, and/or support, a program that provides care to infants who require level III NICU care;
   5. be responsible for inpatient activities in the NICU(s) and, as appropriate, obstetrical, well newborn, and/or pediatric units;
   6. coordinate with respective neonatal, pediatric, and obstetric care services, as appropriate;

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

7. provide oversight of annual neonatal-specific education which includes low-volume, high-risk procedures consistent with the care provided in the level III NICU; and
8. foster collaborative relationships with multidisciplinary team members, facility leadership, and higher-level facilities to create a diverse, equitable, and inclusive environment to improve the quality of care and patient care outcomes.[5]

Clinical Nurse Staffing

(h) A written nurse staffing plan is in place that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RNs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9,10]

Clinical Nurse Staff

(i) Each clinical nurse will:
1. be an RN, with nursing certification specific to the care environment preferred;
2. demonstrate a current status of NRP completion;
3. participate in annual simulation and skills verification, which includes low-volume, high-risk procedures consistent with the types of care provided in the level III NICU; and
4. promote a family-centered approach to care, including but not limited to skin-to-skin care, appropriate developmental positioning based on gestational age, lactation and breastfeeding support, and engagement of families in their infant's care.

(j) If the facility utilizes LPNs or nonlicensed direct care providers to support the clinical nursing staff, the facility must:
1. have written criteria that define the LPNs' or nonlicensed direct care providers' scope of neonatal care;
2. provide annual education specific to the care of the neonatal population served; and
3. have a written staffing plan that establishes collaborative work assignments in accordance with the facility's policies and procedures.

Nursing Orientation and Education

(k) Level III NICU nursing orientation will incorporate didactic education, simulation, skills verification, and competency and will be tailored to the individual needs of the nurse based on clinical experience.[9]

(l) The facility will document an annual educational needs assessment to determine the educational needs of the clinical nursing staff and ancillary team members.

(m) Annual nursing education will address the annual needs assessment and incorporate simulation and skill verification of low-volume, high-risk procedures consistent with the types of care provided in the level III NICU and include education related to serious safety events.

Clinical Nurse Specialist

(n) The clinical nurse specialist will:
1. be an RN, with neonatal nursing certification and clinical nurse specialist certification preferred[5];
2. have at least a Bachelor of Science in Nursing, Master's or Doctorate preferred[5];
3. demonstrate a current status of NRP completion[5];
4. foster continuous quality improvement in nursing care[5];
5. develop and educate staff to provide evidence-based nursing care[5];
6. be responsible for mentoring new staff and developing team building skills[5];
7. provide leadership to multidisciplinary teams[5];
8. facilitate case management of high-risk neonatal patients[5]; and
9. cultivate collaborative relationships with multidisciplinary team members and facility leadership to improve the quality of care and patient care outcomes.[5]

(o) The roles and responsibilities of the NICU clinical nurse specialist can be allocated to multiple individuals to perform this role.

Clinical Nurse Educator

(p) The NICU clinical nurse educator will:
1. be an RN, with nursing certification specific to the care environment preferred;
2. have at least a Bachelor of Science in Nursing, Master's preferred;
3. demonstrate a current status of NRP completion;
4. cultivate collaborative relationships with the neonatal nurse leader and facility leadership to improve the quality of care and patient care outcomes[5]; and
5. have experience and expertise to evaluate the educational needs of the clinical staff, develop didactic and skill-based educational tools, oversee education and skills verification, and evaluate retention of content, critical thinking skills, and competency relevant to level III neonatal care.[9]

(q) The facility will have a dedicated individual with sufficient time allocated to perform the roles and responsibilities of the NICU clinical nurse educator.

Neonatal Transport

(r) If the facility has a neonatal critical care transport program, it will have an identified director of neonatal transport services.[5] The director of neonatal transport services can be the neonatal medical director or another physician who is a pediatrician, board eligible or certified neonatologist, pediatric hospitalist, or pediatric medical subspecialist with expertise and experience in neonatal and infant transport.[5]
1. If the facility does not have its own transport program, the facility must have policies and procedures in place to identify a local neonatal transport program to facilitate transport.[5]

(s) Responsibilities of the director of neonatal transport services include the following:
1. train and supervise staff[5];
2. provide appropriate review of all transport records[5];

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

3. develop and implement policies and procedures for patient care during transport[5];
4. develop guidelines for determining transport team composition and medical control and establish a mechanism to track adherence[5];
5. establish policies and procedures to provide transport updates and outreach education[5];
6. establish a program for evaluating performance by tracking data, identifying trends, and implementing quality improvement initiatives to address transport performance in a coordinated systematic approach within a culture of safety, equity, and prevention[5]; and
7. report neonatal transport data and neonatal-specific reviews back to the NPSQIP.
8. The director of neonatal transport services may delegate specific requirements to other person(s) or group(s) but retains the responsibility of certifying that these functions are addressed appropriately.[5]

(t) The facility will:
1. establish minimum education, experience, and training requirements for all transport team members[15];
2. select transport team members based on their experience and competence in the care of neonates and the transport team must collectively have the ability to provide a level of care that is similar to that of the admitting unit[15]; and
3. provide annual transport education to all transport team members that incorporates equipment training, didactic education, simulation, and skills verification of low-volume, high-risk procedures consistent with the types of care provided during neonatal transport.[15]

Neonatal Outreach

(u) The level III facility will provide multidisciplinary outreach education to referring facilities by assessing educational needs and evaluating clinical care and outcomes, including transport data, as part of collaboration with lower-level neonatal facilities, if applicable.[5]

Pediatric Medical Subspecialists

(v) The facility must have the ability to obtain pediatric medical subspecialist advice or formal consultation either on-site or by prearranged consultative agreement using telehealth technology and/or telephone consultation from a distant location from a broad range of pediatric medical subspecialists including, but not limited to[2]:
1. cardiology, pulmonology, infectious disease, neurology, ophthalmology, endocrinology, hematology, gastroenterology, nephrology, and genetics or metabolism.

(w) If the pediatric medical subspecialist is available for on-site consultation, they will:
1. have credentials to consult at the facility including documented training, certification, competencies, and CME specific to their subspecialty; and
2. document consultations in the medical record within an appropriate time frame and as defined by the facility's policies and procedures.

Neonatal Surgical Program — Optional for Level III

Pediatric Surgeons

(x) Pediatric surgeons and pediatric surgical specialists will be available on-site or at another closely related NICU facility.[5]
1. If pediatric surgery is not offered on-site at the facility, policies and procedures will be in place with a facility that provides surgical care to facilitate transfer of an infant when needed.
   i. Infants requiring cardiovascular surgery or extracorporeal membrane oxygenation (ECMO) will be transferred to a facility that provides these services.
2. If pediatric surgery is accessible on-site, the surgeons will:
   i. be available at the bedside within 1 hour of request or identified need[16];
   ii. have credentials to provide care at the facility, including documented training, certification, competencies, and continuing education specific to their pediatric surgery specialty[16];
   iii. establish a program for evaluating surgical performance by accurately tracking data, identifying trends, and implementing quality improvement initiatives to address surgical performance in a coordinated systematic approach within a culture of safety, equity, and prevention[16]; and
   iv. report neonatal surgical and anesthesia care back to the NPSQIP.

Anesthesiologists

(y) If pediatric surgery is performed on-site, anesthesia providers with pediatric expertise must[16]:
1. be on the medical staff and promptly available 24/7 to respond to the bedside within 1 hour of request or identified need[16];
2. serve as the primary responsible anesthesia provider for all infants $<$24 mo of age and should serve as the primary anesthesiologist for children $\leq$5 y of age based on the American Society of Anesthesiologists (ASA) physical status classification[16]; and
3. be physically present for all neonatal surgical procedures for which they serve as the primary responsible anesthesia provider.[16]

Laboratory Services

(z) Laboratory services will have:
1. laboratory personnel on-site 24/7;
2. the ability to determine blood type, crossmatch, and perform antibody testing;
3. a blood bank capable of providing blood component therapy and irradiated, leukoreduced or CMV-negative blood;
   i. policies and procedures will be in place to facilitate emergent access to blood and blood component therapy so that the NICU can provide hematologic interventions, if applicable;
4. the ability to perform neonatal blood gas monitoring;
5. the ability to perform analysis on small volume samples; and
6. access to perinatal pathology services, if applicable.

(aa) Low-volume specialty laboratory services may be provided by an outside laboratory, but the facility will have policies and procedures in place to maintain timely and direct communication of all critical value results.

Pharmacy

(bb) The facility will have at least 1 registered pharmacist with experience in neonatal and/or pediatric pharmacology who will:
1. be available for consultation on-site, or by telehealth or telephone, 24/7;
2. complete continuing education requirements specific to pediatric and neonatal pharmacology; and

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

3. participate in multidisciplinary care, including participation in patient care rounds.

(cc) The facility will have neonatal appropriate total parenteral nutrition (TPN) available 24/7, and:

1. the facility will have a written policy and procedure for the proper preparation and delivery of TPN.

(dd) The pharmacy will have policies and procedures in place to address drug shortages and to verify medications are appropriately allocated to the level III NICU, and:

1. have policies and procedures in place to verify neonatal competency for pharmacy staff supporting and preparing medications for neonatal patients.

Diagnostic Imaging

(ee) Radiology services will have:

1. appropriately trained radiology personnel continuously available on-site to meet routine diagnostic imaging needs and to address emergencies;
2. fluoroscopy available on-call 24/7;
   i. if fluoroscopy is not offered on-site at the facility, policies and procedures will be in place to facilitate transfer of an infant to a higher level of care;
3. personnel appropriately trained in the following techniques will be on-call and/or available on-site to perform advanced imaging as requested:
   i. ultrasonography, including cranial ultrasonography;
   ii. computed tomography (CT); and
   iii. magnetic resonance imaging (MRI); and
4. the ability to provide timely imaging interpretation by radiologists with pediatric expertise as requested.

(ff) The facility will provide pediatric echocardiography and have the ability to consult with a pediatric cardiologist for timely echocardiography interpretation as requested.

Respiratory Therapy

(gg) The respiratory care leader will:

1. be a full-time respiratory care practitioner, with neonatal and pediatric respiratory care certification preferred;
2. have sufficient time allocated to oversee the RTs who provide care in the level III NICU;
3. provide oversight of annual simulation and skills verification which includes neonatal respiratory care modalities and low-volume, high-risk neonatal respiratory procedures;
4. develop a written RT staffing plan that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RTs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adherence and to verify respiratory therapy staffing is adequate for patient care needs[9]; and
5. maintain appropriate staffing ratios for infants receiving supplemental oxygen and positive pressure ventilation.

(hh) Respiratory care practitioners assigned to the NICU will:

1. be a respiratory care practitioner with documented experience and training in the respiratory support of newborns and infants, with neonatal and pediatric respiratory care certification preferred;
2. be on-site 24/7 and immediately available to supervise assisted ventilation, assist in resuscitation, and attend deliveries;
3. demonstrate a current status of NRP completion;
4. participate in annual simulation and respiratory skills verification, which includes low-volume, high-risk procedures consistent with the types of respiratory care provided in the NICU; and
5. have their credentials reviewed by the respiratory care leader annually for adequacy and adherence.

Dietitian

(ii) At least 1 registered dietitian or nutritionist who has specialized training in neonatal nutrition will have dedicated time allotted to serve the NICU and will[5]:

1. collaborate with the medical team to establish feeding protocols, develop patient-specific feeding plans, and help determine nutritional needs at discharge;
2. establish policies and procedures to verify proper preparation and storage of human milk and formula;
3. participate in multidisciplinary care, including participation in patient care rounds; and
4. have policies and procedures for dietary consultation for infants in the NICU.

Neonatal Nutrition

(jj) The facility will:

1. provide a specialized area or room, with limited access and away from the bedside, to accommodate mixing of formula or additives to human milk[5];
2. develop standardized feeding protocols for the advancement of feedings based on the availability of, and family preference for human milk, donor human milk, fortification of human milk and formula; and
3. have policies and procedures in place for accurate verification and administration of human milk and formula, and to avoid misappropriation.

Lactation and Breastfeeding Support

(kk) The facility will:

1. have personnel with the knowledge and skills to support lactation available at all times;
2. have an IBCLC available for on-site consultation on weekdays and accessible by telehealth or telephone 24/7; and
3. operationally review IBCLC personnel on an annual basis to establish adequately trained lactation coverage based on the specific need and volume of the neonatal population served.[11]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Neonatal Therapists

(ll) The facility will provide on-site consultative services by qualified neonatal therapists to address the 6 core practice domains (environment, family and psychosocial support, sensory system, neurobehavioral system, neuromotor and musculoskeletal systems, and oral feeding and swallowing) and to provide the appropriate care for the neonatal population served.[12]

(mm) The facility will have on-site access to the following neonatal therapists who have dedicated time allocated to serve the NICU:

1. an occupational and/or physical therapist with neonatal expertise, and neonatal therapy certification preferred[5]; and
2. a speech language pathologist with neonatal expertise, skilled in the evaluation and management of neonatal feeding and swallowing concerns, and neonatal therapy certification preferred.[5]
   i. If swallow studies are not offered on-site at the facility, policies and procedures will be in place to facilitate neonatal transfer to a higher level of care.

(nn) The facility will operationally review neonatal therapist personnel on an annual basis to maintain adequate multidisciplinary neonatal therapist coverage based on the specific need and volume of the neonatal population served.[12]

Social Worker

(oo) The NICU social worker will:

1. be a Master's prepared medical social worker with perinatal and/or pediatric experience.[5]

(pp) The facility will:

1. provide 1 social worker for every 30 beds providing level III neonatal care and/or specialty and subspecialty perinatal care[5];
2. have a written description that clearly identifies the responsibilities and functions of the NICU social worker; and
3. have social services available for each family with an infant in the NICU as needed.

Pastoral Care

(qq) Personnel skilled in pastoral care will be available as needed and by family request, and will represent, or have the ability to consult, multiple religious affiliations representative of the population served.[5]

Retinopathy of Prematurity

(rr) The facility must have a process in place to appropriately identify infants at risk for retinopathy of prematurity to guarantee timely examination and treatment by having[13]:

1. documented policies and procedures for the monitoring, treatment, and follow-up of retinopathy of prematurity[5,13]; and
2. the ability to perform on-site retinal examinations, or off-site interpretation of digital photographic retinal images, by a pediatric ophthalmologist or retinal specialist with expertise in retinopathy of prematurity.[5,13]

Discharge and Follow-up

(ss) Systems will be in place to establish preparation for NICU discharge, including postdischarge follow-up by general and subspecialty pediatric care providers, home care arrangements and community service resources, and enrollment in a developmental follow-up program as needed.

1. The facility will:
   i. have written medical, neurodevelopmental, and psychosocial criteria that automatically warrant high-risk neonatal follow-up with appropriate developmental follow-up services; and
   ii. provide developmental follow-up services or have a written referral agreement with a developmental follow-up clinic or practice, when possible, to provide neurodevelopmental services for the neonatal population served.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

STANDARD VII: LEVEL IV NICU REQUIREMENTS

Level IV NICU Requirements

(a) The level IV neonatal facility will:

1. provide comprehensive care for infants born at all gestational ages and birth weights, with mild to complex critical conditions or medical problems requiring sustained life support, hemodynamic support, conventional and high frequency mechanical ventilation, iNO delivery, and/or therapeutic hypothermia[2];
2. have the capability to provide surgical repair of complex congenital or acquired conditions[2];
3. have the ability to provide ECMO or policies and procedures in place to facilitate neonatal transfer to another unit or facility that provides ECMO[2];
4. maintain a broad range of pediatric medical subspecialists, pediatric surgical specialists, and pediatric anesthesiologists[2];
5. facilitate transport and provide outreach education to lower-level facilities[2]; and
6. have sufficient experience based on patient volume and a systematic process to assess the quality of care provided, including a method to track specific quality indicators and clinical diagnoses, review aggregate data using accepted methodology, and develop action plans as needed to improve patient outcomes.[2,14]

Neonatal Medical Director

(b) The NMD will:

1. be a board-certified neonatologist or equivalent;
   i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine;
2. complete annual CME specific to neonatology; and
3. demonstrate a current status of NRP completion.

Neonatologists

(c) The NICU neonatologists will:

1. be a board eligible or certified neonatologist or equivalent;
   i. if the neonatologist is certified The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine;
2. complete annual CME specific to neonatology;
3. demonstrate a current status of NRP completion;
4. have credentials that are reviewed by the NMD at least every 2 years; and
5. preferably be on-site and immediately available 24/7, or on-call and available to arrive on-site within an appropriate time frame, as defined by the facility's policies and procedures.
   i. If a neonatologist is not on-site 24/7, a written policy will be in place that defines the criteria for notification and time frame for on-site presence, and a tracking mechanism for compliance is required.

Privileged Care Providers

(d) Privileged care providers with neonatal-specific training qualified to manage the care of infants with mild to complex critical conditions, including emergencies, will be on-site 24/7 and[5]:

1. demonstrate a current status of NRP completion;
2. complete annual continuing education requirements specific to neonatology; and
3. have their credentials reviewed at least every 2 years by the NMD.

(e) At least 1 person with the skills to perform a complete neonatal resuscitation, including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately available on-site 24/7[7]; and

1. demonstrate a current status of NRP completion.

(f) The facility will establish a written policy for backup privileged care provider coverage that establishes flexibility for variable census and acuity. This policy will document the criteria for notification and time frame for on-site presence, be based on allocating the appropriate number of competent medical providers to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9]

Nursing Leadership

(g) The level IV NICU nurse leader will:

1. be an RN with experience and training in neonatal nursing and conditions, with nursing certification preferred[5];
2. have at least a Bachelor of Science in Nursing, Master's preferred;
3. demonstrate a current status of NRP completion;
4. have sufficient experience and expertise to create, and/or support, a program that provides care to infants who require level IV NICU care;
5. be responsible for inpatient activities in the NICU(s) and, as appropriate, obstetrical, well newborn, and/or pediatric units;
6. coordinate with respective neonatal, pediatric, and obstetric care services, as appropriate;
7. provide oversight of annual neonatal-specific education, which includes low-volume, high-risk procedures consistent with the care provided in the level IV NICU; and
8. foster collaborative relationships with multidisciplinary team members and facility leadership to create a diverse, equitable, and inclusive environment to improve the quality of care and patient care outcomes.[5]

Clinical Nurse Staffing

(h) A written nurse staffing plan is in place that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RNs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9,10]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Clinical Nurse Staff

(i) Each clinical nurse will:
   1. be an RN, with nursing certification specific to the care environment preferred;
   2. demonstrate a current status of NRP completion;
   3. participate in annual simulation and skills verification, which includes low-volume, high-risk procedures consistent with the types of care provided in the level IV NICU; and
   4. promote a family-centered approach to care, including but not limited to skin-to-skin care, appropriate developmental positioning based on gestational age, lactation and breastfeeding support, and engagement of families in their infant's care.

(j) If the facility utilizes LPNs or nonlicensed direct care providers to support the clinical nursing staff, the facility must:
   1. have written criteria that define the LPNs' or nonlicensed direct care providers' scope of neonatal care;
   2. provide annual education specific to the care of the neonatal population served; and
   3. have a written staffing plan that establishes collaborative work assignments in accordance with the facility's policies and procedures.

Nursing Orientation and Education

(k) Level IV NICU nursing orientation will incorporate didactic education, simulation, skills verification, and competency and will be tailored to the individual needs of the nurse based on clinical experience.[9]

(l) The facility will document an annual educational needs assessment to determine the educational needs of the clinical nursing staff and ancillary team members.

(m) Annual nursing education will address the annual needs assessment and incorporate simulation and skill verification of low-volume, high-risk procedures consistent with the types of care provided in the level IV NICU and include education related to serious safety events.

Clinical Nurse Specialist

(n) The clinical nurse specialist will:
   1. be an RN, with neonatal nursing certification and clinical nurse specialist certification preferred[5];
   2. have at least a Master of Science in Nursing, Doctorate preferred[5];
   3. demonstrate a current status of NRP completion[5];
   4. foster continuous quality improvement in nursing care[5];
   5. develop and educate staff to provide evidence-based nursing care[5];
   6. be responsible for mentoring new staff and developing team building skills[5];
   7. provide leadership to multidisciplinary teams[5];
   8. facilitate case management of high-risk neonatal patients[5]; and
   9. cultivate collaborative relationships with multidisciplinary team members and facility leadership to improve the quality of care and patient care outcomes.[5]

(o) The facility will have a dedicated full-time equivalent (FTE) allocated to perform the roles and responsibilities of the NICU clinical nurse specialist.

Clinical Nurse Educator

(p) The NICU clinical nurse educator will:
   1. be an RN, with nursing certification specific to the care environment preferred;
   2. have at least a Bachelor of Science in Nursing, Master's preferred;
   3. demonstrate a current status of NRP completion;
   4. cultivate collaborative relationships with the neonatal nurse leader and facility leadership to improve the quality of care and patient care outcomes[5]; and
   5. have experience and expertise to evaluate the educational needs of the clinical staff, develop didactic and skill-based educational tools, oversee education and skills verification, and evaluate retention of content, critical thinking skills, and competency relevant to level IV neonatal care.[9]

(q) The facility will have at least 1 dedicated FTE allocated to perform the roles and responsibilities of the NICU clinical nurse educator.

Additional Neonatal Support Personnel

(r) The facility will foster collaborative and consultative relationships with additional neonatal support personnel to facilitate comprehensive multidisciplinary care consistent with the types of care provided in the level IV NICU.

Neonatal Transport

(s) If the facility has a neonatal critical care transport program, it will have an identified director of neonatal transport services.[5] The director of neonatal transport services can be the neonatal medical director or another physician who is a pediatrician, board eligible or certified neonatologist, pediatric hospitalist, or pediatric medical subspecialist with expertise and experience in neonatal and infant transport.[5]
   1. If the facility does not have its own transport program, the facility must have policies and procedures in place to identify a local neonatal transport program to facilitate transport.[5]

(t) Responsibilities of the director of neonatal transport services include the following:
   1. train and supervise staff[5];
   2. provide appropriate review of all transport records[5];
   3. develop and implement policies and procedures for patient care during transport[5];
   4. develop guidelines for determining transport team composition and medical control and establish a mechanism to track adherence[5];
   5. establish policies and procedures to provide transport updates and outreach education[5];
   6. establish a program for evaluating performance by tracking data, identifying trends, and implementing quality improvement initiatives to address transport performance in a coordinated systematic approach within a culture of safety, equity, and prevention[5]; and
   7. report neonatal transport data and neonatal-specific reviews back to the NPSQIP.
   8. The director of neonatal transport services may delegate specific requirements to other person(s) or group(s) but retains the responsibility of certifying that these functions are addressed appropriately.[5]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

(u) The facility will:
1. establish minimum education, experience, and training requirements for all transport team members[15];
2. select transport team members based on their experience and competence in the care of neonates and the transport team must collectively have the ability to provide a level of care that is similar to that of the admitting unit[15]; and
3. provide annual transport education to all transport team members that incorporates equipment training, didactic education, simulation, and skills verification of low-volume, high-risk procedures consistent with the types of care provided during neonatal transport.[15]

Neonatal Outreach

(v) The level IV facility will provide multidisciplinary outreach education to referring facilities by assessing educational needs and evaluating clinical care and outcomes, including transport data, as part of collaboration with lower-level neonatal facilities.[5]

Pediatric Medical Subspecialists

(w) The facility must have on-site access to a broad range of pediatric medical subspecialties including, but not limited to[2]:
1. cardiology, pulmonology, infectious disease, neurology, ophthalmology, endocrinology, hematology, gastroenterology, nephrology, and genetics or metabolism; and
2. the pediatric medical subspecialists must:
   i. be readily accessible for in-person consultation;
   ii. have credentials to consult at the facility, including documented training, certification, competencies, and continuing education specific to their subspeciality; and
   iii. document consultations in the medical record within an appropriate time frame and as defined by the facility's policies and procedures.

Neonatal Surgical Program – Required for Level IV

Pediatric Surgeons

(x) Pediatric surgeons and pediatric surgical specialists will:
1. be available at the bedside within 1 hour of request or identified need and be capable of performing major pediatric surgery, including surgery for complex conditions[16];
   i. if transplant or cardiac surgery is not offered on-site at the facility, policies and procedures will be in place to facilitate neonatal transport to a facility that provides appropriate surgical care;
2. provide consultation to a broad range of pediatric surgical specialists including, but not limited to[5,16]:
   i. general pediatric surgery, neurosurgery, urology, ophthalmology, otolaryngology, orthopedics, and plastic surgery;
3. have credentials to provide care at the facility, including documented training, certification, competencies, and continuing education specific to their pediatric surgery specialty[16];
4. establish a program for evaluating surgical performance by accurately tracking data, identifying trends, and implementing quality improvement initiatives to address surgical performance in a coordinated systematic approach within a culture of safety, equity, and prevention[16]; and
5. report neonatal surgical and anesthesia care back to the NPSQIP.

Anesthesiologists

(y) Pediatric anesthesiologists must:
1. be on the medical staff and promptly available 24/7 to respond to the bedside within 1 hour of request or identified need[16];
2. serve as the primary responsible anesthesia provider for all infants $<$24 mo of age and should serve as the primary anesthesiologist for children $\leq$5 y of age or based on the ASA physical status classification[16]; and
3. be physically present for all neonatal surgical procedures for which they serve as the primary responsible anesthesia provider.[16]

Laboratory Services

(z) Laboratory services will have:
1. laboratory personnel on-site 24/7;
2. the ability to determine blood type, crossmatch, and perform antibody testing;
3. a blood bank capable of providing blood component therapy and irradiated, leukoreduced or CMV-negative blood;
   i. policies and procedures will be in place to facilitate emergent access to blood and blood component therapy so that the NICU can provide a full range of hematologic interventions;
4. the ability to perform neonatal blood gas monitoring;
5. the ability to perform analysis on small volume samples;
6. the capability to process biopsies and perform autopsies; and
7. access to perinatal pathology services, if applicable.

(aa) Low-volume specialty laboratory services may be provided by an outside laboratory, but the facility will have policies and procedures in place to maintain timely and direct communication of all critical value results.

Pharmacy

(bb) The facility will have at least 1 registered pharmacist with experience in neonatal and/or pediatric pharmacology who will:
1. be available for consultation on-site, or by telehealth or telephone, 24/7;
2. complete continuing education requirements specific to pediatric and neonatal pharmacology; and
3. participate in multidisciplinary care, including participation in patient care rounds.

(cc) The facility will have neonatal appropriate TPN available 24/7; and
1. the facility will have a written policy and procedure for the proper preparation and delivery of TPN.

(dd) The pharmacy will have policies and procedures in place to address drug shortages and to verify medications are appropriately allocated to the level IV NICU; and
1. have policies and procedures in place to verify neonatal competency for pharmacy staff supporting and preparing medications for neonatal patients.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Diagnostic Imaging

(ee) Radiology services will have:

1. appropriately trained radiology personnel continuously available on-site to meet routine diagnostic imaging needs and to address emergencies;
2. fluoroscopy available on-call 24/7;
3. personnel appropriately trained in the following techniques will be on-call and/or available on-site to perform advanced imaging as requested:
   i. ultrasonography, including cranial ultrasonography;
   ii. CT;
   iii. MRI; and
4. the ability to provide timely imaging interpretation by radiologists with pediatric expertise as requested.

(ff) The facility will provide pediatric echocardiography and have the ability to consult with a pediatric cardiologist for timely echocardiography interpretation as requested.

Respiratory Therapy

(gg) The respiratory care leader will:

1. be a full-time respiratory care practitioner, with neonatal and pediatric respiratory care certification preferred;
2. have sufficient time allocated to oversee the RTs who provide care in the level IV NICU;
3. provide oversight of annual simulation and skills verification, including neonatal respiratory care modalities and low-volume, high-risk neonatal respiratory procedures;
4. develop a written RT staffing plan that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RTs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adherence and to verify respiratory therapy staffing is adequate for patient care needs[9]; and
5. maintain appropriate staffing ratios for infants receiving supplemental oxygen and positive pressure ventilation.

(hh) Respiratory care practitioners assigned to the NICU will:

1. be a respiratory care practitioner with documented experience and training in the respiratory support of newborns and infants, with neonatal and pediatric respiratory care certification preferred;
2. be on-site 24/7 and immediately available to supervise assisted ventilation, assist in resuscitation, and attend deliveries, if applicable;
3. demonstrate a current status of NRP completion;
4. participate in annual simulation and respiratory skills verification, which includes low-volume, high-risk procedures consistent with the types of respiratory care provided in the NICU; and
5. have their credentials reviewed by the respiratory care leader annually for adequacy and adherence.

Dietitian

(ii) The NICU will have at least 1 full-time NICU-dedicated registered dietitian or nutritionist available on-site who has specialized training in neonatal nutrition and will[5]:

1. collaborate with the medical team to establish feeding protocols, develop patient-specific feeding plans, and help determine nutritional needs at discharge;
2. establish policies and procedures to verify proper preparation and storage of human milk and formula;
3. participate in multidisciplinary care, including participation in patient care rounds; and
4. have policies and procedures for dietary consultation for infants in the NICU.

Neonatal Nutrition

(jj) The facility will:

1. provide a specialized area or room, with limited access and away from the bedside, to accommodate mixing of formula or additives to human milk[5];
2. develop standardized feeding protocols for the advancement of feedings based on the availability of, and family preference for human milk, donor human milk, fortification of human milk and formula; and
3. have policies and procedures in place for accurate verification and administration of human milk and formula, and to avoid misappropriation.

Lactation and Breastfeeding Support

(kk) The facility will:

1. have personnel with the knowledge and skills to support lactation available at all times;
2. have an IBCLC available for on-site consultation on weekdays and accessible by telehealth or telephone 24/7; and
3. operationally review IBCLC personnel on an annual basis to establish adequately trained lactation coverage based on the specific need and volume of the neonatal population served.[11]

Neonatal Therapists

(ll) The facility will provide on-site consultative services by qualified neonatal therapists to address the 6 core practice domains (environment, family or psychosocial support, sensory system, neurobehavioral system, neuromotor and musculoskeletal systems, and oral feeding and swallowing) and to provide the appropriate care for the neonatal population served.[12]

(mm) The facility will have on-site access to the following neonatal therapists who have dedicated time allocated to serve the NICU:

1. an occupational and/or physical therapist with sufficient neonatal expertise, and neonatal therapy certification preferred[5]; and
2. a speech language pathologist with neonatal expertise, skilled in the evaluation and management of neonatal feeding and swallowing concerns, and neonatal therapy certification preferred.[5]

(nn) The facility will operationally review neonatal therapist personnel on an annual basis to maintain adequate multidisciplinary neonatal therapist coverage based on the specific need and volume of the neonatal population served.[12]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Child Life Services

(oo) Child life services, or the equivalent, will be available for on-site consultation to support patient- and family-centered care by establishing and maintaining therapeutic relationships between patients, family members, multidisciplinary team members, and community resources.

Social Worker

(pp) The NICU social worker will:

1. be a Master's prepared medical social worker with perinatal and/or pediatric experience.[5]

(qq) The facility will:

1. provide at least 1 social worker for every 30 beds providing level IV neonatal care and/or specialty and subspecialty perinatal care, if applicable[5];
2. have a written description that clearly identifies the responsibilities and functions of the NICU social worker; and
3. have social services available for each family with an infant in the NICU as needed.

Pastoral Care

(rr) Personnel skilled in pastoral care will be available as needed and by family request, and will represent, or have the ability to consult, multiple religious affiliations representative of the population served.[5]

Retinopathy of Prematurity

(ss) The facility must have a process in place to appropriately identify infants at risk for retinopathy of prematurity to guarantee timely examination and treatment by having[13]:

1. documented policies and procedures for the monitoring, treatment, and follow-up of retinopathy of prematurity[5,13]; and
2. the ability to perform on-site retinal examinations, or off-site interpretation of digital photographic retinal images, by a pediatric ophthalmologist or retinal specialist with expertise in retinopathy of prematurity.[5,13]

Discharge and Follow-up

(tt) Systems will be in place to establish preparation for NICU discharge including postdischarge follow-up by general and subspecialty pediatric care providers, home care arrangements and community service resources, and enrollment in a developmental follow-up program as needed.

1. The facility will:
   i. have written medical, neurodevelopmental, and psychosocial criteria that automatically warrant high-risk neonatal follow-up with appropriate developmental follow-up services; and
   ii. provide developmental follow-up services or have a written referral agreement with a developmental follow-up clinic or practice, when possible, to provide neurodevelopmental services for the neonatal population served.

APPENDIX: NEONATAL LEVELS OF CARE COMPARISON: LEVEL (II, III, AND IV) REQUIREMENTS

Level II	Level III	Level IV
Level of Neonatal Care Requirements		
(a) The Level II SCN will provide comprehensive care of infants born ≥32 wk or with birth wt ≥1500 g who[2]: 1. are mild to moderately ill with physiologic immaturity or who have conditions that are expected to resolve quickly[2]; 2. are not anticipated to require subspecialty services on an urgent basis[2]; 3. require CPAP or short term (less than 24 h) conventional mechanical ventilation for a condition expected to resolve rapidly or until transfer to a higher-level facility is achieved[2]; or 4. are back transferred from a higher-level facility for convalescent care.[2]	(a) The Level III neonatal facility will: 1. provide comprehensive care for infants born at all gestational ages and birth weights, with mild to complex critical conditions or medical problems requiring sustained life support, hemodynamic support, and/or conventional mechanical ventilation[2]; 2. have the ability to provide high-frequency ventilation, iNO delivery, and/or therapeutic hypothermia or have policies and procedures in place to facilitate neonatal transfer to another unit or facility that provides these services[2]; 3. provide care for infants who are back transferred for convalescent care[2]; and 4. have sufficient experience based on patient volume and a systematic process to assess the quality of care provided to each very low birth weight infant, including a method to track specific quality indicators including obstetrical and neonatal transfers, review aggregate data using accepted methodology, and develop	(a) The Level IV neonatal facility will: 1. provide comprehensive care for infants born at all gestational ages and birth weights, with mild to complex critical conditions or medical problems requiring sustained life support, hemodynamic support, conventional and high frequency mechanical ventilation, iNO delivery, and/or therapeutic hypothermia[2]; 2. have the capability to provide surgical repair of complex congenital or acquired conditions[2]; 3. have the ability to provide ECMO or have policies and procedures in place to facilitate neonatal transfer to another unit or facility that provides ECMO[2]; 4. maintain a broad range of pediatric medical subspecialists, pediatric surgical specialists, and pediatric anesthesiologists[2]; 5. facilitate transport and provide outreach education to lower-level facilities[2]; and 6. have sufficient experience based on patient volume and a systematic process to assess the quality of care provided, including a method

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
	action plans as needed to improve patient outcomes.[2,14]	to track specific quality indicators and clinical diagnoses, review aggregate data using accepted methodology, and develop action plans as needed to improve patient outcomes.[2,14]
Neonatal Medical Director		
(b) The NMD will: 1. be a physician who is a board-eligible or -certified neonatologist or a board-certified pediatrician with sufficient training and expertise to assume responsibility of care for infants who require level II care, including endotracheal intubation, assisted ventilation, and CPAP management, or equivalent[5]; i. if the neonatologist or pediatrician is certified by The American Board of Pediatrics, they will meet MOC requirements; 2. complete annual CME specific to neonatology; and 3. demonstrate a current status of NRP completion.	(b) The NMD will: 1. be a board-eligible or -certified neonatologist or equivalent; i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine; 2. complete annual CME specific to neonatology; and 3. demonstrate a current status of NRP completion.	(b) The NMD will: 1. be a board-certified neonatologist or equivalent; i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine; 2. complete annual CME specific to neonatology; and 3. demonstrate a current status of NRP completion.
Neonatologists		
(c) If the NMD and/or on-site provider is not a neonatologist, the privileged care provider must maintain a consultative relationship with a board-certified or -eligible neonatologist at a higher-level neonatal facility; and 1. the facility must have a written policy or guideline that defines the criteria for neonatologist consultation at a higher-level neonatal facility.	(c) The NICU neonatologists will: 1. be a board-eligible or -certified neonatologist or equivalent; i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine; 2. complete annual CME specific to neonatology; 3. demonstrate a current status of NRP completion; 4. have credentials that are reviewed by the NMD at least every 2 years; and 5. preferably be on-site and immediately available 24/7, or on-call and available to arrive on-site within an appropriate time frame, as defined by the facility's policies and procedures. i. If a neonatologist is not on-site 24/7, a written policy will be in place that defines the criteria for notification and time frame for on-site presence, and a tracking mechanism for compliance is required.	(c) The NICU neonatologists will: 1. be a board-eligible or -certified neonatologist or equivalent; i. if the neonatologist is certified by The American Board of Pediatrics, they will meet MOC requirements in neonatal-perinatal medicine; 2. complete annual CME specific to neonatology; 3. demonstrate a current status of NRP completion; 4. have credentials that are reviewed by the NMD at least every 2 years; and 5. preferably be on-site and immediately available 24/7, or on-call and available to arrive on-site within an appropriate time frame as defined by the facility's policies and procedures. i. If a neonatologist is not on-site 24/7, a written policy will be in place that defines the criteria for notification and time frame for on-site presence, and a tracking mechanism for compliance is required.
Privileged Care Providers		
(d) Privileged care providers with pediatric- or neonatal-specific training qualified to manage the care of infants with mild to moderate critical conditions, including emergencies will[5]: 1. be continuously available on-site, or on-call and available to arrive on-site within an appropriate time frame, as defined by the facility's policies and procedures; i. if the on-site or on-call provider is not a physician, a written policy will be in	(d) Privileged care providers with neonatal-specific training qualified to manage the care of infants with mild to complex critical conditions, including emergencies, will be on-site 24/7 and[5]: 1. demonstrate a current status of NRP completion; 2. complete annual continuing education requirements specific to neonatology; and 3. have their credentials reviewed at least every 2 years by the NMD.	(d) Privileged care providers with neonatal-specific training qualified to manage the care of infants with mild to complex critical conditions, including emergencies, will be on-site 24/7 and[5]: 1. demonstrate a current status of NRP completion; 2. complete annual continuing education requirements specific to neonatology; and 3. have their credentials reviewed at least every 2 years by the NMD.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
place that defines the criteria for notification and time frame for on-site physician presence, and a tracking mechanism for compliance is required; ii. if an infant is maintained on a ventilator, a pediatric- or neonatal-specific privileged care provider who can manage respiratory emergencies will be immediately available on-site; 2. demonstrate a current status of NRP completion; 3. complete annual continuing education requirements specific to neonatology; and 4. have their credentials reviewed at least every 2 years by the NMD. (e) At least 1 person with the skills to perform a complete neonatal resuscitation including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately available on-site 24/7[7]; and 1. demonstrate a current status of NRP completion. (f) The facility will establish a written policy for backup medical care provider coverage that establishes flexibility for variable census and acuity. This policy will document the criteria for notification and time frame for on-site presence, be based on allocating the appropriate number of competent privileged care providers to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9]	(e) At least 1 person with the skills to perform a complete neonatal resuscitation, including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately on-site 24/7[7]; and 1. demonstrate a current status of NRP completion. (f) The facility will establish a written policy for backup medical care provider coverage that establishes flexibility for variable census and acuity. This policy will document the criteria for notification and time frame for on-site presence, be based on allocating the appropriate number of competent privileged care providers to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9]	(e) At least 1 person with the skills to perform a complete neonatal resuscitation, including endotracheal intubation, establishment of vascular access, and administration of medications must be immediately available on-site 24/7[7]; and 1. demonstrate a current status of NRP completion. (f) The facility will establish a written policy for backup medical care provider coverage that establishes flexibility for variable census and acuity. This policy will document the criteria for notification and time frame for on-site presence, be based on allocating the appropriate number of competent privileged care providers to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9]
Nursing Leadership		
(g) The level II SCN nurse leader will: 1. be an RN with experience and training in perinatal nursing and neonatal conditions, with nursing certification preferred[5]; 2. have at least a Bachelor of Science in Nursing, Master's preferred; 3. demonstrate a current status of NRP completion; 4. have sufficient experience and expertise to create, and/or support, a program that provides care to infants who require level II SCN care; 5. be responsible for inpatient activities in the level II SCN and, as appropriate, obstetrical, well newborn, and/or pediatric units; 6. coordinate with respective neonatal, pediatric, and obstetric care services, as appropriate; 7. provide oversight of annual neonatal-specific education, which includes low-volume, high-risk procedures consistent with the care provided in the level II SCN; and	(g) The level III NICU nurse leader will: 1. be an RN with experience and training in neonatal nursing and conditions, with nursing certification preferred[5]; 2. have at least a Bachelor of Science in Nursing, Master's preferred; 3. demonstrate a current status of NRP completion; 4. have sufficient experience and expertise to create, and/or support, a program that provides care to infants who require level III NICU care; 5. be responsible for inpatient activities in the NICU(s) and, as appropriate, obstetrical, well newborn, and/or pediatric units; 6. coordinate with respective neonatal, pediatric, and obstetric care services, as appropriate; 7. provide oversight of annual neonatal-specific education, which includes low-volume, high-risk procedures consistent with the care provided in the level III NICU; and	(g) The level IV NICU nurse leader will: 1. be an RN with experience and training in neonatal nursing and conditions, with nursing certification preferred[5]; 2. have at least a Bachelor of Science in Nursing, Master's preferred; 3. demonstrate a current status of NRP completion; 4. have sufficient experience and expertise to create, and/or support, a program that provides care to infants who require level IV NICU care; 5. be responsible for inpatient activities in the NICU(s) and, as appropriate, obstetrical, well newborn, and/or pediatric units; 6. coordinate with respective neonatal, pediatric, and obstetric care services, as appropriate; 7. provide oversight of annual neonatal-specific education, which includes low-volume, high-risk procedures consistent with the care provided in the level IV NICU; and

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
8. foster collaborative relationships with multidisciplinary team members, facility leadership, and higher-level facilities to create a diverse, equitable, and inclusive environment focused on the quality of care and patient care outcomes.[5]	8. foster collaborative relationships with multidisciplinary team members, facility leadership, and higher-level facilities to create a diverse, equitable, and inclusive environment to improve the quality of care and patient care outcomes.[5]	8. foster collaborative relationships with multidisciplinary team members and facility leadership to create a diverse, equitable, and inclusive environment to improve the quality of care and patient care outcomes.[5]
Clinical Nurse Staffing		
(h) A written nurse staffing plan is in place that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RNs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9,10]	(h) A written nurse staffing plan is in place that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RNs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9,10]	(h) A written nurse staffing plan is in place that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RNs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adequacy and adherence.[9,10]
Clinical Nurse Staff		
(i) Each clinical nurse will: 1. be an RN, with nursing certification specific to the care environment preferred; 2. demonstrate a current status of NRP completion; 3. participate in annual simulation and skills verification, which includes low-volume, high-risk procedures consistent with the types of care provided in the level II SCN; and 4. promote a family-centered approach to care, including but not limited to skin-to-skin care, appropriate developmental positioning based on gestational age, lactation and breastfeeding support, and engagement of families in their infant's care.	(i) Each clinical nurse will: 1. be an RN, with nursing certification specific to the care environment preferred; 2. demonstrate a current status of NRP completion; 3. participate in annual simulation and skills verification, which includes low-volume, high-risk procedures consistent with the types of care provided in the level III NICU; and 4. promote a family-centered approach to care, including but not limited to skin-to-skin care, appropriate developmental positioning based on gestational age, lactation and breastfeeding support, and engagement of families in their infant's care.	(i) Each clinical nurse will: 1. be an RN, with nursing certification specific to the care environment preferred; 2. demonstrate a current status of NRP completion; 3. participate in annual simulation and skills verification, which includes low-volume, high-risk procedures consistent with the types of care provided in the level IV NICU; and 4. promote a family-centered approach to care, including but not limited to skin-to-skin care, appropriate developmental positioning based on gestational age, lactation and breastfeeding support, and engagement of families in their infant's care.
(j) If the facility utilizes LPNs or nonlicensed direct care providers to support the clinical nursing staff, the facility must: 1. have written criteria that define the LPNs' or nonlicensed direct care providers' scope of neonatal care; 2. provide annual education specific to the care of the neonatal population served; and 3. have a written staffing plan that establishes collaborative work assignments in accordance with the facility's policies and procedures.	(j) If the facility utilizes LPNs or nonlicensed direct care providers to support the clinical nursing staff, the facility must: 1. have written criteria that define the LPNs' or nonlicensed direct care providers' scope of neonatal care; 2. provide annual education specific to the care of the neonatal population served; and 3. have a written staffing plan that establishes collaborative work assignments in accordance with the facility's policies and procedures.	(j) If the facility utilizes LPNs or nonlicensed direct care providers to support the clinical nursing staff, the facility must: 1. have written criteria that define the LPNs' or nonlicensed direct care providers' scope of neonatal care; 2. provide annual education specific to the care of the neonatal population served; and 3. have a written staffing plan that establishes collaborative work assignments in accordance with the facility's policies and procedures.
Nursing Orientation and Education		
(k) Level II SCN nursing orientation will incorporate didactic education, simulation, skills verification, and competency and will be tailored to the individual needs of the nurse based on clinical experience.[9]	(k) Level III NICU nursing orientation will incorporate didactic education, simulation, skills verification, and competency and will be tailored to the individual needs of the nurse based on clinical experience.[9]	(k) Level IV NICU nursing orientation will incorporate didactic education, simulation, skills verification, and competency and will be tailored to the individual needs of the nurse based on clinical experience.[9]
(l) The facility will document an annual educational needs assessment to determine the educational needs of the clinical nursing staff and ancillary team members.	(l) The facility will document an annual educational needs assessment to determine the educational needs of the clinical nursing staff and ancillary team members.	(l) The facility will document an annual educational needs assessment to determine the educational needs of the clinical nursing staff and ancillary team members.
(m) Annual nursing education will address the annual needs assessment and incorporate simulation and skills verification of low-	(m) Annual nursing education will address the annual needs assessment and incorporate simulation and skill verification of low-volume,	(m) Annual nursing education will address the annual needs assessment and incorporate simulation and skill verification of low-volume,

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
volume, high-risk procedures consistent with the types of care provided in the level II SCN and include education related to serious safety events.	high-risk procedures consistent with the types of care provided in the level III NICU and include education related to serious safety events.	high-risk procedures consistent with the types of care provided in the level IV NICU and include education related to serious safety events.
Clinical Nurse Specialist		
	(n) The clinical nurse specialist will: 1. be an RN, with neonatal nursing certification and clinical nurse specialist certification preferred[5]; 2. have at least a Bachelor of Science in Nursing; Master's or Doctorate preferred[5]; 3. demonstrate a current status of NRP completion[5]; 4. foster continuous quality improvement in nursing care[5]; 5. develop and educate staff to provide evidence-based nursing care[5]; 6. be responsible for mentoring new staff and developing team building skills[5]; 7. provide leadership to multidisciplinary teams[5]; 8. facilitate case management of high-risk neonatal patients[5]; and 9. cultivate collaborative relationships with multidisciplinary team members and facility leadership to improve the quality of care and patient care outcomes.[5] (o) The roles and responsibilities of the NICU clinical nurse specialist can be allocated to multiple individuals to perform this role.	(n) The clinical nurse specialist will: 1. be an RN, with neonatal nursing certification and clinical nurse specialist certification preferred[5]; 2. have at least a Master of Science in Nursing; Doctorate preferred[5]; 3. demonstrate a current status of NRP completion[5]; 4. foster continuous quality improvement in nursing care[5]; 5. develop and educate staff to provide evidence-based nursing care[5]; 6. be responsible for mentoring new staff and developing team building skills[5]; 7. provide leadership to multidisciplinary teams[5]; 8. facilitate case management of high-risk neonatal patients[5]; and 9. cultivate collaborative relationships with multidisciplinary team members and facility leadership to improve the quality of care and patient care outcomes.[5] (o) The facility will have a dedicated FTE allocated to perform the roles and responsibilities of the NICU clinical nurse specialist.
Clinical Nurse Educator		
(n) The level II SCN clinical nurse educator or perinatal nurse educator will: 1. be an RN, with nursing certification specific to the care environment preferred; 2. have at least a Bachelor of Science in Nursing; Master's preferred; 3. demonstrate a current status of NRP completion; 4. cultivate collaborative relationships with the neonatal nurse leader and facility leadership to improve the quality of care and patient care outcomes[5]; and 5. have experience and expertise to evaluate the educational needs of the clinical staff, develop didactic and skill-based educational tools, oversee education and skills verification, and evaluate retention of content, critical thinking skills, and competency relevant to level II neonatal care.[9] (o) The facility will have a dedicated individual with sufficient time allocated to perform the roles and responsibilities of the clinical nurse educator.	(p) The NICU clinical nurse educator will: 1. be an RN, with nursing certification specific to the care environment preferred; 2. have at least a Bachelor of Science in Nursing; Master's preferred; 3. demonstrate a current status of NRP completion; 4. cultivate collaborative relationships with the neonatal nurse leader and facility leadership to improve the quality of care and patient care outcomes[5]; and 5. have experience and expertise to evaluate the educational needs of the clinical staff, develop didactic and skill-based educational tools, oversee education and skills verification, and evaluate retention of content, critical thinking skills, and competency relevant to level III neonatal care.[9] (q) The facility will have a dedicated individual with sufficient time allocated to perform the roles and responsibilities of the NICU clinical nurse educator.	(p) The NICU clinical nurse educator will: 1. be an RN, with nursing certification specific to the care environment preferred; 2. have at least a Bachelor of Science in Nursing; Master's preferred; 3. demonstrate a current status of NRP completion; 4. cultivate collaborative relationships with the neonatal nurse leader and facility leadership to improve the quality of care and patient care outcomes[5]; and 5. have experience and expertise to evaluate the educational needs of the clinical staff, develop didactic and skill-based educational tools, oversee education and skills verification, and evaluate retention of content, critical thinking skills, and competency relevant to level IV neonatal care.[9] (q) The facility will have at least 1 dedicated FTE allocated to perform the roles and responsibilities of the NICU clinical nurse educator.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
Additional Neonatal Support Personnel		
		(r) The facility will foster collaborative and consultative relationships with additional neonatal support personnel to facilitate comprehensive multidisciplinary care consistent with the types of care provided in the level IV NICU.
Neonatal Transport		
(p) The facility will have policies and procedures in place to identify a local neonatal transport program to facilitate neonatal transport to a higher-level neonatal facility.	(r) If the facility has a neonatal critical care transport program, it will have an identified director of neonatal transport services.[5] The director of neonatal transport services can be the neonatal medical director or another physician who is a pediatrician, board-eligible or -certified neonatologist, pediatric hospitalist, or pediatric medical subspecialist with expertise and experience in neonatal and infant transport.[5] 1. If the facility does not have its own transport program, the facility must have policies and procedures in place to identify a local neonatal transport program to facilitate transport.[5] (s) Responsibilities of the director of neonatal transport services include the following: 1. train and supervise staff[5]; 2. provide appropriate review of all transport records[5]; 3. develop and implement policies and procedures for patient care during transport[5]; 4. develop guidelines for determining transport team composition and medical control, and establish a mechanism to track adherence[5]; 5. establish policies and procedures to provide transport updates and outreach education[5]; 6. establish a program for evaluating performance by tracking data, identifying trends, and implementing quality improvement initiatives to address transport performance in a coordinated systematic approach within a culture of safety, equity, and prevention[5]; and 7. report neonatal transport data and neonatal-specific reviews back to the NPSQIP. 8. The director of neonatal transport services may delegate specific requirements to other person(s) or group(s) but retains the responsibility of certifying that these functions are addressed appropriately.[5] (t) The facility will: 1. establish minimum education, experience, and training requirements for all transport team members[15]; 2. select transport team members based on their experience and competence in the care of neonates and the transport team must collectively have the ability to provide	(s) If the facility has a neonatal critical care transport program, it will have an identified director of neonatal transport services.[5] The director of neonatal transport services can be the neonatal medical director or another physician who is a pediatrician, board-eligible or -certified neonatologist, pediatric hospitalist, or pediatric medical subspecialist with expertise and experience in neonatal and infant transport.[5] 1. If the facility does not have its own transport program, the facility must have policies and procedures in place to identify a local neonatal transport program to facilitate transport.[5] (t) Responsibilities of the director of neonatal transport services include the following: 1. train and supervise staff[5]; 2. provide appropriate review of all transport records[5]; 3. develop and implement policies and procedures for patient care during transport[5]; 4. develop guidelines for determining transport team composition and medical control, and establish a mechanism to track adherence[5]; 5. establish policies and procedures to provide transport updates and outreach education[5]; 6. establish a program for evaluating performance by tracking data, identifying trends, and implementing quality improvement initiatives to address transport performance in a coordinated systematic approach within a culture of safety, equity, and prevention[5]; and 7. report neonatal transport data and neonatal-specific reviews back to the NPSQIP. 8. The director of neonatal transport services may delegate specific requirements to other person(s) or group(s) but retains the responsibility of certifying that these functions are addressed appropriately.[5] (u) The facility will: 1. establish minimum education, experience, and training requirements for all transport team members[15]; 2. select transport team members based on their experience and competence in the care of neonates and the transport team must collectively have the ability to provide a level of care that is similar to that of the admitting unit[15]; and 3. provide annual transport education to all transport team members, which incorporates equipment training, didactic education,

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
	a level of care that is similar to that of the admitting unit[15]; and 3. provide annual transport education to all transport team members, which incorporates equipment training, didactic education, simulation, and skills verification of low-volume, high-risk procedures consistent with the types of care provided during neonatal transport.[15]	simulation, and skills verification of low-volume, high-risk procedures consistent with the types of care provided during neonatal transport.[15]
Neonatal Outreach		
	(u) The level III facility will provide multidisciplinary outreach education to referring facilities by assessing education needs and evaluating clinical care and outcomes, including transport data, as part of collaboration with lower-level neonatal facilities, if applicable.[5]	(v) The level IV facility will provide multidisciplinary outreach education to referring facilities by assessing education needs and evaluating clinical care and outcomes, including transport data, as part of collaboration with lower-level neonatal facilities.[5]
Pediatric Medical Subspecialists		
(q) Policies and procedures will be in place for referral to a higher level of neonatal care when pediatric medical subspecialty or pediatric surgical specialty consultation and/or intervention is needed.	(v) The facility must have the ability to obtain pediatric medical subspecialist advice or formal consultation either on-site or by prearranged consultative agreement using telehealth technology and/or telephone consultation from a distant location, from a broad range of pediatric medical subspecialists including, but not limited to[2]: 1. cardiology, pulmonology, infectious disease, neurology, ophthalmology, endocrinology, hematology, gastroenterology, nephrology, and genetics or metabolism. (w) If the pediatric medical subspecialist is available for on-site consultation, they will: 1. have credentials to consult at the facility which includes documented training, certification, competencies, and continuing education specific to their subspecialty; and 2. document consultations in the medical record within an appropriate time frame and as defined by the facility's policies and procedures.	(w) The facility must have on-site access to a broad range of pediatric medical subspecialties including, but not limited to[2]: 1. cardiology, pulmonology, infectious disease, neurology, ophthalmology, endocrinology, hematology, gastroenterology, nephrology, and genetics or metabolism; and 2. the pediatric medical subspecialists must: i. be readily accessible for in-person consultation; ii. have credentials to consult at the facility, including documented training, certification, competencies, and continuing education specific to their subspeciality; and iii. document consultations in the medical record within an appropriate time frame and as defined by the facility's policies and procedures.
Neonatal Surgical Program		
Pediatric Surgeons		
(Optional for level III, but required for level IV)	(x) Pediatric surgeons and pediatric surgical specialists will be available on-site or at another closely related NICU facility.[5] 1. If pediatric surgery is not offered on-site at the facility, policies and procedures will be in place with a facility that provides surgical care to facilitate transfer of an infant when needed. i. Infants requiring cardiovascular surgery or ECMO will be transferred to a facility that provides these services. 2. If pediatric surgery is accessible on-site, the surgeons will:	(x) Pediatric surgeons and pediatric surgical specialists will: 1. be available at the bedside within 1 hour of request or identified need and be capable of performing major pediatric surgery, including surgery for complex conditions[16]; i. if transplant or cardiac surgery is not offered on-site at the facility, policies and procedures will be in place to facilitate neonatal transport to a facility that provides appropriate surgical care; 2. provide consultation to a broad range of pediatric surgical specialists including, but not limited to[5,16]:

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
	i. be available at the bedside within 1 hour of request or identified need[16]; ii. have credentials to provide care at the facility, including documented training, certification, competencies, and continuing education specific to their pediatric surgery specialty[16]; iii. establish a program for evaluating surgical performance by accurately tracking data, identifying trends, and implementing quality improvement initiatives to address surgical performance in a coordinated systematic approach within a culture of safety, equity, and prevention[16]; and iv. report neonatal surgical and anesthesia care back to the NPSQIP.	i. general pediatric surgery, neurosurgery, urology, ophthalmology, otolaryngology, orthopedics, and plastic surgery; 3. have credentials to provide care at the facility, including documented training, certification, competencies, and continuing education specific to their pediatric surgery specialty[16]; 4. establish a program for evaluating surgical performance by accurately tracking data, identifying trends, and implementing quality improvement initiatives to address surgical performance in a coordinated systematic approach within a culture of safety, equity, and prevention[16]; and 5. report neonatal surgical and anesthesia care back to the NPSQIP.
Anesthesiologists		
	(y) If pediatric surgery is performed on-site, anesthesia providers with pediatric expertise must[16]: 1. be on the medical staff and promptly available 24/7 to respond to the bedside within 1 hour of request or identified need[16]; 2. serve as the primary responsible anesthesia provider for all infants <24 mo of age and should serve as the primary anesthesiologist for children ≤5 y of age based on the ASA physical status classification[16]; and 3. be physically present for all neonatal surgical procedures for which they serve as the primary responsible anesthesia provider.[16]	(y) Pediatric anesthesiologists must: 1. be on the medical staff and promptly available 24/7 to respond to the bedside within 1 hour of request or identified need[16]; 2. serve as the primary responsible anesthesia provider for all infants <24 mo of age and should serve as the primary anesthesiologist for children ≤5 y of age or based on the ASA physical status classification[16]; and 3. be physically present for all neonatal surgical procedures for which they serve as the primary responsible anesthesia provider.[16]
Laboratory Services		
(r) Laboratory services will have: 1. laboratory personnel on-site 24/7; 2. the ability to determine blood type, crossmatch, and perform antibody testing; 3. a blood bank capable of providing blood component therapy and irradiated, leukoreduced or CMV-negative blood; 4. the ability to perform neonatal blood gas monitoring; and 5. the ability to perform analysis on small volume samples. (s) Low-volume specialty laboratory services may be provided by an outside laboratory, but the facility will have policies and procedures in place to verify timely and direct communication of all critical value results.	(z) Laboratory services will have: 1. laboratory personnel on-site 24/7; 2. the ability to determine blood type, crossmatch, and perform antibody testing; 3. a blood bank capable of providing blood component therapy and irradiated, leukoreduced or CMV-negative blood; i. policies and procedures will be in place to facilitate emergent access to blood and blood component therapy so that the NICU can provide hematologic interventions, if applicable; 4. the ability to perform neonatal blood gas monitoring; 5. the ability to perform analysis on small volume samples; and 6. access to perinatal pathology services, if applicable. (aa) Low-volume specialty laboratory services may be provided by an outside laboratory, but the facility will have policies and procedures in place to maintain timely and direct communication of all critical value results.	(z) Laboratory Services will have: 1. laboratory personnel on-site 24/7; 2. the ability to determine blood type, crossmatch, and perform antibody testing; 3. a blood bank capable of providing blood component therapy and irradiated, leukoreduced or CMV negative blood; i. policies and procedures will be in place to facilitate emergent access to blood and blood component therapy so that the NICU can provide a full range of hematologic interventions; 4. the ability to perform neonatal blood gas monitoring; 5. the ability to perform analysis on small volume samples; 6. the capability to process biopsies and perform autopsies; and 7. access to perinatal pathology services, if applicable. (aa) Low-volume specialty laboratory services may be provided by an outside laboratory, but the facility will have policies and procedures in

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
		place to maintain timely and direct communication of all critical value results.
Pharmacy		
(t) The facility will have at least 1 registered pharmacist with experience in neonatal and/or pediatric pharmacology who will: 1. be available for consultation on-site, or by telehealth or telephone, 24/7; 2. complete continuing education requirements specific to pediatric and neonatal pharmacology; and 3. participate in multidisciplinary care, as needed. (u) The pharmacy will have policies and procedures in place to address drug shortages and to verify medications are appropriately allocated to the level II SCN; and 1. have policies and procedures in place to verify neonatal competency for pharmacy staff supporting and preparing medications for neonatal patients.	(bb) The facility will have at least 1 registered pharmacist with experience in neonatal and/or pediatric pharmacology who will: 1. be available for consultation on-site, or by telehealth or telephone, 24/7; 2. complete continuing education requirements specific to pediatric and neonatal pharmacology; and 3. participate in multidisciplinary care, including participation in patient care rounds. (cc) The facility will have neonatal appropriate TPN available 24/7; and 1. the facility will have a written policy and procedure for the proper preparation and delivery of TPN. (dd) The pharmacy will have policies and procedures in place to address drug shortages and to verify medications are appropriately allocated to the level III NICU; and 1. have policies and procedures in place to verify neonatal competency for pharmacy staff supporting and preparing medications for neonatal patients.	(bb) The facility will have at least 1 registered pharmacist with experience in neonatal and/or pediatric pharmacology who will: 1. be available for consultation on-site, or by telehealth or telephone, 24/7; 2. complete continuing education requirements specific to pediatric and neonatal pharmacology; and 3. participate in multidisciplinary care, including participation in patient care rounds. (cc) The facility will have neonatal appropriate TPN available 24/7; and 1. the facility will have a written policy and procedure for the proper preparation and delivery of TPN. (dd) The pharmacy will have policies and procedures in place to address drug shortages and to verify medications are appropriately allocated to the level IV NICU; and 1. have policies and procedures in place to verify neonatal competency for pharmacy staff supporting and preparing medications for neonatal patients.
Diagnostic Imaging		
(v) Radiology services will have: 1. appropriately trained radiology personable available on-site to meet routine diagnostic imaging needs and to address emergencies; 2. personnel appropriately trained in ultrasonography, including cranial ultrasonography, will be on-call and/or available on-site to perform advanced imaging as requested; and 3. the ability to provide timely imaging interpretation by radiologists with pediatric expertise as requested.	(ee) Radiology services will have: 1. appropriately trained radiology personnel available on-site to meet routine diagnostic imaging needs and to address emergencies; 2. fluoroscopy available on-call 24/7; i. if fluoroscopy is not offered on-site at the facility, policies and procedures will be in place to facilitate transfer of an infant to a higher level of care; 3. personnel appropriately trained in the following techniques will be on-call and/or available on-site to perform advanced imaging as requested: i. ultrasonography, including cranial ultrasonography; ii. CT; iii. MRI; and 4. the ability to provide timely imaging interpretation by radiologists with pediatric expertise as requested. (ff) The facility will provide pediatric echocardiography and have the ability to consult with a pediatric cardiologist for timely echocardiography interpretation as requested.	(ee) Radiology services will have: 1. appropriately trained radiology personnel available on-site to meet routine diagnostic imaging needs and to address emergencies; 2. fluoroscopy available on-call 24/7; 3. personnel appropriately trained in the following techniques will be on-call and/or available on-site to perform advanced imaging as requested: i. ultrasonography, including cranial ultrasonography; ii. CT; iii. MRI; and 4. the ability to provide timely imaging interpretation by radiologists with pediatric expertise as requested. (ff) The facility will provide pediatric echocardiography and have the ability to consult with a pediatric cardiologist for timely echocardiography interpretation as requested.
Respiratory Therapy		
(w) The respiratory care leader will: 1. be a full-time respiratory care practitioner, with neonatal and pediatric respiratory care certification preferred; 2. have sufficient time allocated to oversee	(gg) The respiratory care leader will: 1. be a full-time respiratory care practitioner, with neonatal and pediatric respiratory care certification preferred; 2. have sufficient time allocated to oversee the	(gg) The respiratory care leader will: 1. be a full-time respiratory care practitioner, with neonatal and pediatric respiratory care certification preferred; 2. have sufficient time allocated to oversee the

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
the RTs who provide care in the level II SCN; 3. provide oversight of annual simulation and skills verification, which includes neonatal respiratory care modalities and low-volume, high-risk neonatal respiratory procedures; 4. develop a written RT staffing plan that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RTs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adherence and to verify respiratory therapy staffing is adequate for patient care needs[9]; and 5. maintain appropriate staffing ratios for infants receiving supplemental oxygen and positive pressure ventilation.	RTs who provide care in the level III NICU; 3. provide oversight of annual simulation and skills verification, which includes neonatal respiratory care modalities and low-volume, high-risk neonatal respiratory procedures; 4. develop a written RT staffing plan that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RTs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adherence and to verify respiratory therapy staffing is adequate for patient care needs[9]; and 5. maintain appropriate staffing ratios for infants receiving supplemental oxygen and positive pressure ventilation.	RTs who provide care in the level IV NICU; 3. provide oversight of annual simulation and skills verification, which includes neonatal respiratory care modalities and low-volume, high-risk neonatal respiratory procedures; 4. develop a written RT staffing plan that establishes flexibility for variable census and acuity. This plan and actual staffing will be based on allocating the appropriate number of competent RTs to a care situation, attend to a safe and high-quality work environment, and be operationally reviewed annually for adherence and to verify respiratory therapy staffing is adequate for patient care needs[9]; and 5. maintain appropriate staffing ratios for infants receiving supplemental oxygen and positive pressure ventilation.
(x) Respiratory care practitioners assigned to the SCN will: 1. be a respiratory care practitioner with documented experience and training in the respiratory support of newborns and infants, with neonatal and pediatric respiratory care certification preferred; 2. be on-site 24/7 and immediately available when an infant is supported by assisted ventilation or CPAP; 3. be able to attend deliveries and assist with resuscitation as requested; 4. demonstrate a current status of NRP completion; 5. participate in annual simulation and respiratory skills verification, which includes low-volume, high-risk procedures consistent with the types of respiratory care provided in the SCN; and 6. have their credentials reviewed by the respiratory care leader annually for adequacy and adherence.	(hh) Respiratory care practitioners assigned to the NICU will: 1. be a respiratory care practitioner with documented experience and training in the respiratory support of newborns and infants, with neonatal and pediatric respiratory care certification preferred; 2. be on-site 24/7 and immediately available to supervise assisted ventilation, assist in resuscitation, and attend deliveries; 3. demonstrate a current status of NRP completion; 4. participate in annual simulation and respiratory skills verification, which includes low-volume, high-risk procedures consistent with the types of respiratory care provided in the NICU; and 5. have their credentials reviewed by the respiratory care leader annually for adequacy and adherence.	(hh) Respiratory care practitioners assigned to the NICU will: 1. be a respiratory care practitioner with documented experience and training in the respiratory support of newborns and infants, with neonatal and pediatric respiratory care certification preferred; 2. be on-site 24/7 and immediately available to supervise assisted ventilation, assist in resuscitation, and attend deliveries, if applicable; 3. demonstrate a current status of NRP completion; 4. participate in annual simulation and respiratory skills verification, which includes low-volume, high-risk procedures consistent with the types of respiratory care provided in the NICU; and 5. have their credentials reviewed by the respiratory care leader annually for adequacy and adherence.
Dietitian		
(y) The facility must have, or have the ability to consult with, at least 1 registered dietitian or nutritionist who has specialized training in neonatal nutrition, who will[5]: 1. collaborate with the medical team to establish feeding protocols, develop patient-specific feeding plans, and help determine nutritional needs at discharge; 2. establish policies and procedures to verify proper preparation and storage of human milk and formula; and 3. have policies and procedures for dietary consultation for infants in the SCN.	(ii) At least 1 registered dietitian or nutritionist who has specialized training in neonatal nutrition will have dedicated time allotted to serve the NICU and will[5]: 1. collaborate with the medical team to establish feeding protocols, develop patient-specific feeding plans, and help determine nutritional needs at discharge; 2. establish policies and procedures to verify proper preparation and storage of human milk and formula; 3. participate in multidisciplinary care, including participation in patient care rounds; and	(ii) The NICU will have at least 1 full-time NICU-dedicated registered dietitian or nutritionist available on-site who has specialized training in neonatal nutrition and will[5]: 1. collaborate with the medical team to establish feeding protocols, develop patient-specific feeding plans, and help determine nutritional needs at discharge; 2. establish policies and procedures to verify proper preparation and storage of human milk and formula; 3. participate in multidisciplinary care, including participation in patient care rounds; and 4. have policies and procedures for dietary consultation for infants in the NICU.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
	4. have policies and procedures for dietary consultation for infants in the NICU.	
Neonatal Nutrition		
(z) The facility will: 1. provide a specialized area or room, with limited access and away from the bedside, to accommodate mixing of formula or additives to human milk[5]; 2. develop standardized feeding protocols for the advancement of feedings based on the availability of, and family preference for, human milk, donor human milk, fortification of human milk, and formula; and 3. have policies and procedures in place for accurate verification and administration of human milk and formula and to avoid misappropriation.	(jj) The facility will: 1. provide a specialized area or room, with limited access and away from the bedside, to accommodate mixing of formula or additives to human milk[5]; 2. develop standardized feeding protocols for the advancement of feedings based on the availability of, and family preference for, human milk, donor human milk, fortification of human milk, and formula; and 3. have policies and procedures in place for accurate verification and administration of human milk and formula and to avoid misappropriation.	(jj) The facility will: 1. provide a specialized area or room, with limited access and away from the bedside, to accommodate mixing of formula or additives to human milk[5]; 2. develop standardized feeding protocols for the advancement of feedings based on the availability of, and family preference for, human milk, donor human milk, fortification of human milk, and formula; and 3. have policies and procedures in place for accurate verification and administration of human milk and formula and to avoid misappropriation.
Lactation and Breastfeeding Support		
(aa) The facility will: 1. have personnel with the knowledge and skills to support lactation available at all times; 2. have a CLC, IBCLC preferred, available for on-site consultation on weekdays and accessible by telehealth or telephone 24/7; and 3. operationally review CLC and/or IBCLC personnel on an annual basis to establish adequately trained lactation coverage based on the specific need and volume of the neonatal population served.[11]	(kk) The facility will: 1. have personnel with the knowledge and skills to support lactation available at all times; 2. have an IBCLC available for on-site consultation on weekdays, and accessible by telehealth or telephone 24/7; and 3. operationally review IBCLC personnel on an annual basis to establish adequately trained lactation coverage based on the specific need and volume of the neonatal population served.[11]	(kk) The facility will: 1. have personnel with the knowledge and skills to support lactation available at all times; 2. have an IBCLC available for on-site consultation on weekdays, and accessible by telehealth or telephone 24/7; and 3. operationally review IBCLC personnel on an annual basis to establish adequately trained lactation coverage based on the specific need and volume of the neonatal population served.[11]
Neonatal Therapists		
(bb) If the facility does not have in-house access to neonatal therapy expertise, the facility will have a formal process in place for providing on-site consultative services by qualified neonatal therapists to address the 6 core practice domains (environment, family or psychosocial support, sensory system, neurobehavioral system, neuromotor and musculoskeletal systems, and oral feeding and swallowing) and to provide the appropriate care for the neonatal population served. The facility will have on-site access to the following as needed[12]: 1. an occupational or physical therapist with neonatal expertise, and neonatal therapy certification preferred[5]; and 2. at least 1 individual skilled in the evaluation and management of neonatal feeding and swallowing concerns, with neonatal therapy certification preferred.[5] (cc) The facility will operationally review neonatal therapist personnel on an annual basis to maintain adequate multidisciplinary neonatal therapist coverage based on the specific need and volume of the neonatal population served.[12]	(ll) The facility will provide on-site consultative services by qualified neonatal therapists to address the 6 core practice domains (environment, family or psychosocial support, sensory system, neurobehavioral system, neuromotor and musculoskeletal systems, and oral feeding and swallowing) and to provide the appropriate care for the neonatal population served.[12] (mm) The facility will have on-site access to the following neonatal therapists who have dedicated time allocated to serve the NICU: 1. an occupational and/or physical therapist with sufficient neonatal expertise, and neonatal therapy certification preferred[5]; and 2. a speech language pathologist with neonatal expertise, skilled in the evaluation and management of neonatal feeding and swallowing concerns, and neonatal therapy certification preferred.[5] i. If swallow studies are not offered on-site at the facility, policies and procedures will be in place to facilitate neonatal transfer to a higher level of care. (nn) The facility will operationally review neonatal therapist personnel on an annual basis to maintain adequate multidisciplinary neonatal	(ll) The facility will provide on-site consultative services by qualified neonatal therapists to address the 6 core practice domains (environment, family or psychosocial support, sensory system, neurobehavioral system, neuromotor and musculoskeletal systems, and oral feeding and swallowing) and to provide the appropriate care for the neonatal population served.[12] (mm) The facility will have on-site access to the following neonatal therapists who have dedicated time allocated to serve the NICU: 1. an occupational and/or physical therapist with sufficient neonatal expertise, and neonatal therapy certification preferred[5]; and 2. a speech language pathologist with neonatal expertise, skilled in the evaluation and management of neonatal feeding and swallowing concerns, and neonatal therapy certification preferred.[5] (nn) The facility will operationally review neonatal therapist personnel on an annual basis to maintain adequate multidisciplinary neonatal therapist coverage based on the specific need and volume of the neonatal population served.[12]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
	therapist coverage based on the specific need and volume of the neonatal population served.[12]	
Child Life Services		
		(oo) Child life services, or equivalent, will be available for on-site consultation to support patient- and family-centered care by establishing and maintaining therapeutic relationships between patients, family members, multidisciplinary team members, and community resources.
Social Worker		
(dd) The SCN social worker will: 1. be a Master's prepared medical social worker with perinatal and/or pediatric experience.[5] (ee) The facility will: 1. provide 1 social worker for every 30 beds providing level II neonatal care and/or specialty and subspecialty perinatal care[5]; 2. have a written description that clearly identifies the responsibilities and functions of the SCN social worker; and 3. have social services available for each family with an infant in the SCN as needed.	(oo) The NICU social worker will: 1. be a Master's prepared medical social worker with perinatal and/or pediatric experience.[5] (pp) The facility will: 1. provide 1 social worker for every 30 beds providing level III neonatal care and/or specialty and subspecialty perinatal care[5]; 2. have a written description that clearly identifies the responsibilities and functions of the NICU social worker; and 3. have social services available for each family with an infant in the NICU as needed.	(pp) The NICU social worker will: 1. be a Master's prepared medical social worker with perinatal and/or pediatric experience.[5] (qq) The facility will: 1. provide at least 1 social worker for every 30 beds providing level IV neonatal care and/or specialty and subspecialty perinatal care, if applicable[5]; 2. have a written description that clearly identifies the responsibilities and functions of the NICU social worker; and 3. have social services available for each family with an infant in the NICU as needed.
Pastoral Care		
(ff) Personnel skilled in pastoral care will be available as needed and by family request and will represent, or have the ability to consult, multiple religious affiliations representative of the population served.[5]	(qq) Personnel skilled in pastoral care will be available as needed and by family request and will represent, or have the ability to consult, multiple religious affiliations representative of the population served.[5]	(rr) Personnel skilled in pastoral care will be available as needed and by family request and will represent, or have the ability to consult, multiple religious affiliations representative of the population served.[5]
Retinopathy of Prematurity		
(gg) If the facility back transfers infants for convalescent care, the facility must have a process in place to appropriately identify infants at risk for retinopathy of prematurity to guarantee timely examination and treatment by having[13]: 1. documented policies and procedures for the monitoring, treatment, and follow-up of retinopathy of prematurity[5,13]; 2. the ability to perform on-site retinal examinations, or off-site interpretation of digital photographic retinal images, by a pediatric ophthalmologist or retinal specialist with expertise in retinopathy of prematurity, if needed.[5,13]	(rr) The facility must have a process in place to appropriately identify infants at risk for retinopathy to guarantee timely examination and treatment by having[13]: 1. documented policies and procedures for the monitoring, treatment, and follow-up of retinopathy of prematurity[5,13]; and 2. the ability to perform on-site retinal examinations, or off-site interpretation of digital photographic retinal images, by a pediatric ophthalmologist or retinal specialist with expertise in retinopathy of prematurity.[5,13]	(ss) The facility must have a process in place to appropriately identify infants at risk for retinopathy to guarantee timely examination and treatment by having[13]: 1. documented policies and procedures for the monitoring, treatment, and follow-up of retinopathy of prematurity[5,13]; and 2. the ability to perform on-site retinal examinations, or off-site interpretation of digital photographic retinal images, by a pediatric ophthalmologist or retinal specialist with expertise in retinopathy of prematurity.[5,13]
Discharge and Follow-up		
(hh) Systems will be in place to establish preparation for SCN discharge, including postdischarge follow-up by general and subspecialty pediatric care providers, home care arrangements and community service resources, and enrollment in a developmental follow-up program as needed. 1. The facility will: i. have written medical, neurodevelopmental, and psychosocial criteria that automatically warrant high-risk	(ss) Systems will be in place to establish preparation for NICU discharge, including postdischarge follow-up by general and subspecialty pediatric care providers, home care arrangements and community service resources, and enrollment in a developmental follow-up program as needed. 1. The facility will: i. have written medical, neurodevelopmental, and psychosocial criteria that automatically warrant high-risk neonatal follow-up with	(tt) Systems will be in place to establish preparation for NICU discharge including postdischarge follow-up by general and subspecialty pediatric care providers, home care arrangements and community service resources, and enrollment in a developmental follow-up program as needed. 1. The facility will: i. have written medical, neurodevelopmental, and psychosocial criteria that automatically warrant high-risk neonatal follow-up

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

Continued

Level II	Level III	Level IV
neonatal follow-up with appropriate developmental follow-up services; and ii. have a written referral agreement with a developmental follow-up clinic or practice, when possible, to provide neurodevelopmental services for the neonatal population served.	appropriate developmental follow-up services; and ii. provide developmental follow-up services or have a written referral agreement with a developmental follow-up clinic or practice, when possible, to provide neurodevelopmental services for the neonatal population served.	with appropriate developmental follow-up services; and ii. provide developmental follow-up services or have a written referral agreement with a developmental follow-up clinic or practice, when possible, to provide neurodevelopmental services for the neonatal population served.

AAP NICU VERIFICATION PROGRAM LEADERSHIP TEAM

Ann R. Stark, MD, FAAP – Medical Director, NICU Verification Program
DeWayne M. Pursley, MD, MPH, FAAP
Lu-Ann Papile, MD, FAAP
Eric C. Eichenwald, MD, FAAP
Charles T. Hankins, MD, MBA, FAAP
Rosanne K. Buck, RN, MS, NNP-BC, C-ONQS
Tamara J. Wallace, DNP, APRN, NNP-BC
Patricia G. Bondurant, DNP, RN

AAP NICU VERIFICATION PROGRAM SUPPORT STAFF

Nicole Faster, MSN, RN, RNC-NIC
Jaime Thomas, MHA
Sunnah Kim, MS, RN

AAP SECTION ON NEONATAL-PERINATAL MEDICINE CLINICAL LEADERS GROUP

Munish Gupta, MD, MMSc, FAAP
James Barry, MD, FAAP
Jessica Davidson, MD, FAAP
Jeffrey Meyers, MD, FAAP
Michael Posencheg, MD, FAAP

ACKNOWLEDGMENTS

The authors of this paper comprise the American Academy of Pediatrics (AAP) NICU Verification Program's Leadership Team. All are highly experienced clinicians with a long-standing interest in risk-appropriate care. The Standards for Levels of Neonatal Care: II, III, and IV are based on the AAP policy statement "Levels of Neonatal Care" and the AAP/ACOG textbook Guidelines for Perinatal Care. To compile the Standards, the NICU Verification Program Leadership Team collaborated with the AAP Committee on Fetus and Newborn (COFN), the Section on Neonatal-Perinatal Medicine (SONPM), the SONPM Clinical Leaders Group (CLG), and additional neonatal stakeholders. We also acknowledge important guidance from Dr. Keith Oldham and other members of the American College of Surgeons Children's Surgery Verification Quality Improvement Program, the Centers for Disease Control and Prevention, the National Association of Neonatal Nurses, and the National Association of Neonatal Therapists.

REFERENCES

1. Committee on Perinatal Health. *Toward Improving the Outcome of Pregnancy: Recommendations for the Regional Development of Maternal and Perinatal Health Services*. White Plains, NY: March of Dimes National Foundation; 1976
2. American Academy of Pediatrics, Committee on Fetus and Newborn. Levels of neonatal care. *Pediatrics*. 2012;130(3):587–597
3. Kroelinger CD, Okoroh EM, Goodman DA, Lasswell SM, Barfield WD. Comparison of state risk-appropriate neonatal care policies with the 2012 AAP policy statement. *J Perinatol*. 2018;38(4):411–420
4. Kroelinger CD, Rice ME, Okoroh EM, DeSisto CL, Barfield WD. Seven years later: state neonatal risk-appropriate care policy consistency with the 2012 American Academy of Pediatrics Policy. *J Perinatol*. 2022;42(5):595–602
5. Kilpatrick SJ, Papile L, Macones GA, eds; American Academy of Pediatrics, Committee on Fetus and Newborn; American College of Obstetricians and Gynecologists, Committee on Obstetric Practice. *Guidelines for Perinatal Care*. 8th ed. Itasca, IL: American Academy of Pediatrics; 2017
6. Agency for Healthcare Research and Quality. Six domains of health care quality. Available at: https://www.ahrq.gov/talkingquality/measures/six-domains.html#_ftn1. Accessed October 31, 2022
7. Weiner GM, Zaichkin J, eds; American Academy of Pediatrics; American Heart Association. *Textbook of Neonatal Resuscitation*. 8th ed. Itasca, IL: American Academy of Pediatrics; 2021
8. American College of Radiology, American Association of Physicists in Medicine. ACR–AAPM technical standard for diagnostic medical physics performance monitoring of radiographic equipment. Available at: https://www.acr.org/-/media/ACR/Files/Practice-Parameters/RadEquip.pdf. Accessed October 31, 2022
9. Association of Women's Health Obstetric and Neonatal Nurses. Obstetric and neonatal nurses. Perinatal clinical nurse educator: clinical competencies and education guide. *J Obstet Gynecol Neonatal Nurs*. 2021;50(3):e1–e10
10. Association of Women's Health, Obstetric and Neonatal Nurses. Obstetric and neonatal nurses. Standards for professional registered nurse staffing for perinatal units. *J Obstet Gynecol Neonatal Nurs*. 2022;51(4):e5–e98
11. Lober A, Harmon D, Thomas-Jackson SC; United States Lactation Consultant Association. Position paper – professional lactation support staffing in the hospital setting. *Clin Lact*. 2021;12(4):157–158
12. Craig JW, Smith CR. Risk-adjusted/neuroprotective care services in the NICU: the elemental role of the neonatal therapist (OT, PT, SLP). *J Perinatol*. 2020;40(4):549–559
13. Fierson WM; American Academy of Pediatrics, Section on Ophthalmology; American Academy of Opthalmology;

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest

American Association for Pediatric Ophthalmology and Strabismus; American Association of Certified Orthoptists. Screening examination of premature infants for retinopathy of prematurity. *Pediatrics*. 2018;142(6):e20183061

14. Profit J, Gould JB, Bennett M, et al. Racial/ethnic disparity in NICU quality of care delivery. *Pediatrics*. 2017;140(3):e20170918
15. Insoft RM, Schwartz HP, eds; American Academy of Pediatrics, Section on Transport Medicine. *Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients Manual*. 4th ed. Itasca, IL: American Academy of Pediatrics; 2015
16. American College of Surgeons. Optimal resources for children's surgical care: 2021 standards. Available at: https://www.facs.org/-/media/files/quality-programs/csv/2021_optimal_resources_for_childrens_surgical_care.ashx. Accessed March 16, 2022

ADDITIONAL RESOURCES

American Academy of Pediatrics, Committee on Fetus and Newborn. Advanced practice in neonatal nursing. *Pediatrics*. 2009;123(6):1606–1607

Committee on Nutrition; Section on Breastfeeding; Committee on Fetus and Newborn. Donor human milk for the high-risk infant: preparation, safety, and usage options in the United States. *Pediatrics*. 2017;139(1):e20163440

Meyer K, Fernandes CJ, Schwartz HP, eds; American Academy of Pediatrics, Section on Transport Medicine. *Field Guide for Air and Ground Transport of Neonatal and Pediatric Patients: A Quick Reference for Transport Teams*. Itasca, IL: American Academy of Pediatrics; 2018

American Nurses Association. *ANA's Principles for Nurse Staffing*, 3rd ed. Silver Springs, MD: American Nurses Association; 2021

Azzuqa A, Makkar A, Machut K. Use of telemedicine for subspecialty support in the NICU setting. *Semin Perinatol*. 2021;45(5):151425

Barfield WD, Krug SE; Committee on Fetus and Newborn; Disaster Preparedness Advisory Council. Disaster preparedness in neonatal intensive care units. *Pediatrics*. 2017;139(5):e20170507

Best Accredited Colleges. Physician assistant – neonatology: career overview. Available at: https://bestaccreditedcolleges.org/articles/physician-assistant-neonatology-overview-of-this-specific-physician-assistant-field.html. Accessed March 16, 2022

Bondurant PG, Nielsen-Farrell J, Armstrong L. The journey to high reliability in the NICU. *J Perinat Neonatal Nurs*. 2015;29(2):170–178

Brady CJ, D'Amico S, Campbell JP. Telemedicine for retinopathy of prematurity. *Telemed J E Health*. 2020;26(4):556–564

Commission on Accreditation of Medical Transport Systems. *Accreditation Standards of the Commission on Accreditation of Medical Transport Systems*. 11th ed. Sandy Springs, SC: Commission on Accreditation of Medical Transport Systems; 2018

Freed GL, Dunham KM, Lamarand KE, Loveland-Cherry C, Martyn KK; American Board of Pediatrics Research Advisory Committee. Neonatal nurse practitioners: distribution, roles and scope of practice. *Pediatrics*. 2010;126(5):856–860

Nandula PS, Hudak ML. Remove lactation support in the COVID-19 era. *NeoReviews*. 2021;22(6):e392–e397

Beauman SS, Bowles S, eds. National Association of Neonatal Nurses. *Policies, Procedures, and Competencies for Neonatal Nursing*. 6th ed. Chicago, IL: National Association of Neonatal Nurses; 2019

National Association of Neonatal Nurses. RN staffing in the NICU. Position statement #3074. NANN. Available at: http://nann.org/uploads/updated_RN_nicu_staffing.pdf. Accessed September 14, 2022

National Association of Neonatal Nurses. Standards for maintaining competence of neonatal nurse practitioners. Position Statement #3062. Available at: http://nann.org/uploads/Membership/NANNP_Pubs/Standard_for_Maintaining_the_Competence_of_NNPs-FINAL.pdf. Accessed September 14, 2022

Parker LA. Neonatal nurse practitioners in interdisciplinary care of high-risk infants. *NeoReviews*. 2010;11(1):e24–e32

Parker MG, Stellwagen LM, Noble L, Kim JH, Poindexter BB, Puopolo KM; Section on Breastfeeding, Committee on Nutrition, Committee on Fetus and Newborn. Promoting human milk and breastfeeding for the very low birth weight infant. *Pediatrics*. 2021;148(5):e2021054272

Quinn GE, Vinekar A. The role of retinal photography and telemedicine in ROP screening. *Semin Perinatol*. 2019;43(6):367–374

Romito B, Jewell J, Jackson M; AAP Committee on Hospital Care; Association of Child Life Professionals. Child life services. *Pediatrics*. 2021;147(1):e2020040261

Siegel R, Simone J, Sumrall B; Standards Committee of the National Association of Perinatal Social Workers. *Standards for Social Work Services in the Newborn Intensive Care Unit*. San Diego, CA: National Association of Perinatal Social Workers; 2007

Simone J, Duncan J, Derechin H, Siegel R, Sugatt S; Standards Committee of the National Association of Perinatal Social Workers. *Standards for Social Work Services in Obstetric Settings*. San Diego, CA: National Association of Perinatal Social Workers; 2007

The Leapfrog Group. Latest report shows too many high-risk, very-low birth weight babies are being delivered at hospitals ill-equipped to care for them. Available at: https://www.leapfroggroup.org/news-events/latest-report-shows-too-many-high-risk-very-low-birth-weight-babies-are-being-delivered. Accessed March 17, 2022

Van McCrary S, Green HC, Combs A, Mintzer JP, Quirk JG. A delicate subject: the impact of cultural factors on neonatal and perinatal decision making. *J Neonatal Perinatal Med*. 2014;7(1):1–12

Wang KS, Cummings J, Stark A, et al; Section on Surgery, Committee on Fetus and Newborn, Section on Anesthesiology and Pain Medicine. Optimizing resources in children's surgical care: an update on the American College of Surgeons' verification program. *Pediatrics*. 2020;145(5):e20200708

Downloaded from http://publications.aap.org/pediatrics/article-pdf/151/6/e2023061957/1565825/peds_2023061957.pdf
by guest