

The Neonatologist as Primary Care Physician

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Abstract

Although trained first as pediatricians, neonatologists are not typically viewed as primary care physicians. However, given their particular training and expertise, patient population, and interaction with families as the newborn's first physician in many settings, neonatologists may rightly be viewed as the most appropriate primary care physician for newborns with medical or surgical problems. We review the fundamental underpinnings of primary care medicine with particular attention to how the neonatologist functions in such capacities. Neonatologists can contribute greatly to ensuring continuity of care for the sick newborn, the comprehensive nature of that care, and the coordination of care. Neonatologists' interactions with elements of the community to which the newborn will be discharged are an asset, as is their ability to work as part of a team. Given recent changes in practice management, the availability of neonatologists in the United States, and the desire for full-service mother and infant care capabilities in community hospitals, the primary care role of neonatologists bears recognition and support in today's changing healthcare marketplace.

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The fundamental precepts of primary care medicine include providing first-line care to patients^{1,2} and providing care that is continuous over time.^{2,3} While the practice of medicine in the United States has historically been rooted in such a model,¹ a shift toward specialty care has occurred during the past 30 years.¹⁴ Recently, attention has

focused on a return to primary care medicine in this country, even in pediatrics.^{5,8} This has largely been prompted by the current environment of healthcare reform, patient dissatisfaction with disjointed care provided by generalists and subspecialists,⁹ and a general consensus that healthcare costs need to be controlled or curtailed. Government policy makers, medical academicians, and healthcare business managers all support and have called for reforms that incorporate lower cost, patient-centered, primary-care-directed healthcare.

Pediatrics has long been viewed as a primary care specialty in medicine.¹⁸ Within its subspecialties, however, neonatology has not typically shared this classification. This is true even though, much like pediatricians, neonatologists provide primary care for critically ill newborns. Although at times called on by pediatricians as subspecialty consultants for complex disorders or critically ill patients, neonatologists provide primary care for most premature and critically ill newborns, even before the newborn leaves the delivery room.

Historically, neonatal intensive care units (NICUs) were fashioned after their adult critical care predecessors, the medical and surgical ICUs and the cardiac care units. The subspecialty of neonatology thrives on highly technologic interventions designed to "rescue" the most fragile of infants. Indeed, neonatology as practiced in most NICUs does not mesh with the typical image of primary care pediatric medicine. We suggest, however, that neonatology be considered a primary care specialty with "technologic domains." The neonatologist, relying on his or her initial training in pediatrics, functions as a primary care physician but does so in a unique manner.

Unlike many other subspecialists in pediatric medicine,⁹ neonatologists do not deal solely with one organ system. They retain a whole-patient perspective, albeit for a particularly limited and age-defined population. Neonatologists must be cognizant of their role as a uniquely placed, and depended on, primary care physician for hospitalized critically ill newborns. The role and

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attendant skills that the neonatologist brings to the bedside must be distinguished from that of the pediatric intensivist, whose realm and expertise is more appropriately the care of the older child and whose management is characteristically limited to acute interventions for patients whose development is monitored and nurtured by another primary care physician.

The responsibilities of neonatologists that make their primary care role obvious include providing both acute and chronic (convalescent) care, educating families, implementing preventive care, and being involved in decisions regarding discontinuing life support. In some regions of the United States and in large metropolitan areas, neonatologists are the only physicians available in or used by hospitals to provide care for even well newborn infants. A recent survey found that nearly 50% of well baby nurseries in academic hospitals are staffed solely or in part by neonatologists.¹⁰ Recognition by both neonatologists and primary care physicians of the neonatologist's work described herein may help neonatologists in their practice, give credence to their initial training in pediatrics, and accommodate recently elaborated family-centered principles into the total spectrum of newborn and pediatric practice.

... FUNDAMENTALS OF PRIMARY CARE ...

In his introductory chapter to the second edition of *Essentials of Family Medicine*,³ Shahady describes the six principles of family medicine—continuity of care, comprehensiveness, coordination of care, community, prevention, and family. As discussed by Shahady, these principles are directed at the physician-patient relationship in the context of community (outpatient)-oriented primary care. In a parallel analysis, we applied these six principles to the neonatologist's relationship with the newborn patient and his or her family.

Continuity of Care

Continuity of care is especially important for patients with chronic health problems. Physicians maintain continuity of care by reviewing the patient's medical history, making follow-up a priority, establishing a trusting relationship with the patient, and negotiating long-term health goals with the patient and family members, in addition to addressing acute care needs. For the neonatologist, establishing the physician-family relationship might ideally occur during a prenatal consultation. Knowledge of the patient as a

fetus surely begins through communications with the obstetrician-perinatologist during antepartum or peripartum care. When the patient is born and begins a potentially lengthy stay in the NICU, the neonatologist provides continuous care for several weeks to months. Certainly, neonatologists do not provide the only source of continuity for infants, especially as patients are discharged from NICUs to community hospitals or their homes. However, these specialists do provide continuity amidst a myriad of specialists and consultants in pediatric medicine and surgery, nursing, and allied health professions while the newborn is in the nursery or NICU. The neonatologist remains the primary physician for the newborn, especially those who are premature or critically ill, and is most aptly trained and experienced in rendering care to infants.

Continuity of the relationship with the neonatologist is an important consideration for parents throughout their NICU experience and beyond. Neonatologists must recognize the potential for distancing themselves from parents when delegating care to other healthcare providers (eg, fellows, residents, nurses, and students) within the NICU. Rotational attending schedules or call schedules also can impede the necessary continuity sought by both physicians and families in caring for the newborn. Thus neonatologists should try to establish forthrightly a trusting, open, and communicative relationship with families, making themselves available as responsible primary care providers uniquely capable of providing continuity in caring for the sick or premature newborn. Many neonatologists continue their care through follow-up clinics, some extending well into their patients' preschool years. Ultimately, they relinquish their primary care role to another provider but maintain a consultant's role enriched by their early primary care interactions with the patient and family.

Comprehensiveness

Neonatologists must be able to communicate with parents, be aware of their needs, and understand their goals and intents in incorporating a growing premature or potentially handicapped child into their lives. Such awareness includes the recognition of each patient in his or her own family, social, cultural, and psychologic context. Evidence of the neonatologist's comprehensive view of patient care may begin with neonatal transport services, including pre- and postoperative care for the surgical newborn patient, appropriate medical record documentation, recognition of potentially different agendas between parents and physicians, and discussion of social and fiscal needs. The

neonatologist may further fulfill this responsibility by enlisting the help of nurses, social workers, and community liaisons or primary care providers in conducting multidisciplinary discharge planning and ensuring a smooth transition from the NICU to home.

Coordination of Care

The neonatologist is, to borrow Shahady's words, the "orchestrator" of care for the individual patient. In the model of van Weel,² the neonatologist is the "team leader." Indeed, neonatologists identify the additional healthcare providers and resources necessary for the newborn's overall care. Consultants are called, technicians and therapists enlisted, and primary nurses recruited to develop an overall care plan. Neonatal nurse practitioners, unique in their capacity as advance practice nurses within a subspecialty of medicine, are supervised by neonatologists. Neonatologists also act as patient advocates and present and discuss their patients with consultants. They ensure provision of cross-coverage when they themselves are not available. They teach and lead the NICU's staff and assistants in accomplishing the common goal of achieving the newborns' healthy discharge to the community.

Additional evidence of the neonatologist as team leader is the conveying of diagnoses and care plans, at times being the bearer of bad news.¹¹ It is the neonatologist who discusses with the family the successes and failures of care and who helps the family prepare to live with a vulnerable or handicapped child, or with no child at all. Aside from pediatric oncology (which we believe similarly shares in this primary care role), no other pediatric subspecialty so aptly assumes this vital role of primary care provider for patients.

Community

Neonatologists are aware of the number of community factors (parental occupation, culture, values, environment) that facilitate discharge of newborns to their home. Home care in particular is playing a greater role in the gradual recuperation of newborns and infants dependent on medical technology. Being able to direct parents to community resources helps ensure optimal care of newborn patients at home. Neonatologists' ability to coordinate home healthcare, apnea monitoring, respiratory care or home ventilation, and home intravenous nutrition, antibiotic therapy, and phototherapy all attest to their role in fulfilling this aspect of primary care. However, knowing the family's ability to accommodate in-home care and supporting the family's and infant's needs in carrying this out must come first.

Prevention

Although neonatologists may not be able to prevent prematurity, perinatally acquired infections, or birth defects, they have a responsibility to prevent iatrogenic complications and disease while managing sick and premature newborns. Neonatologists can also serve preventive health measures by advocating and becoming involved in parental or family education and establishing a postdischarge care plan that will prevent unnecessary sequelae of prematurity. The neonatologist is the first pediatric care provider with whom the family may discuss infant nutrition, benefits of and special circumstances for breastfeeding the premature newborn, choice of infant formula, and ongoing nutritional needs, such as vitamin supplementation and iron therapy. Since immunizations begin in the newborn period, neonatologists order routine hepatitis B vaccinations, as well as diphtheria and pertussis vaccines for premature infants during lengthy stays. Educational efforts begun in the NICU and continued after discharge may lessen the vulnerability of premature or critically ill infants.

Family

Neonatologists certainly recognize newborns as part of families. Often, the obstetrician/perinatologist seeks a prenatal consultation with the neonatologist for mothers admitted to the perinatal ward or labor and delivery unit with significant medical concerns or in premature labor. Such an introduction and exchange of information from an anxious expectant mother to the physician who will provide primary care to her newborn is most beneficial. In recent years, families have been allowed a greater presence both in the NICU and in family-care-oriented step-down units. The principles of family-centered neonatal care have recently been elaborated on by a group of concerned parents of NICU infants.¹² As previously noted, an awareness of the family's abilities, needs, values, and goals are all necessary to successfully manage the newborn patient and facilitate discharge home. To this end, neonatologists enlist the assistance of perinatal social workers, private support facilities, and state agencies to overcome any geographic or fiscal barriers to joining families with their newborns. One such measure is nesting rooms, common in modern NICUs, for rooming-in the "graduating" newborn with his or her mother.

... TEAMWORK ...

In his review of the development of the primary care team, van Weel² speaks to many of the principles

put forth by Shahady.³ Primary care revolves around two distinguishing characteristics—first-line care and continuity of care. Yet the primary care physician does not work in isolation but with a team. The particular value of this team concept in the primary care environment as it relates to quality improvement¹³ and even the business aspects of healthcare reform in the United States¹⁴ has been previously described.

The successful management of the premature infant must obviously address the antecedent conditions that predispose to preterm labor, the optimum intrapartum management of both the mother and fetus, and the definitive care of the premature or sick newborn. All members of the healthcare team who render their special expertise, from preconceptional counseling through infant discharge, contribute toward the primary care of both mother and infant. The neonatologist cannot treat the infant in isolation but relies on the obstetrician/perinatologist, nurse midwife/practitioner, and other community-level providers to contribute to the care and education of pregnant women, to minimize adverse pregnancy outcomes, and to optimize fetal growth and development. At the time of delivery, the team concept is again apparent in the delivery or operating room. The product of these endeavors is good outcomes for two distinct types of patients.

The team concept with which neonatologists may be most familiar is in the NICU. That a newborn has never before been a patient and is seen for the first time by the neonatologist is unique among physician-patient relationships in pediatric subspecialty medicine. The neonatologist is simultaneously called on to assume primary care responsibilities for the newborn and provide necessary subspecialty expertise. The patients' relevant history is ascertained from the family, the mother's previous pregnancies, the prenatal history of the current pregnancy, and the intrapartum management. Using these data, coupled with the delivery room management and physical examination, the neonatologist determines which nursery is most appropriate and consequently which team of healthcare providers will be involved.

In the NICU, the team grows to include the nursing staff, respiratory therapist, social worker, chaplain, case manager, and eventually the primary care pediatrician or family medicine physician. The neonatologist coordinates the newborn's care in a comprehensive manner, providing care on a daily basis with appropriate concern and consideration for the patient's family and community and a constant view toward hospital discharge. Prevention is necessarily involved in this care, both acutely to reduce iatrogenic sequelae and over time as

the infant moves closer to discharge home or to a community hospital nursery. Ultimately, the neonatologist transfers his or her team leader role to a community-based primary care physician who will continue to be an advocate for the child and orchestrate a new team in caring for the NICU graduate at home.

In many communities, neonatologists have already assumed the primary care role for newborn infants.^{10,15} In these settings, both the sick newborn in need of medical or surgical attention and the well baby with limited hospitalization in the well nursery, rooming-in with his or her mother, or transitioning in the labor-delivery-recovery and postpartum room are cared for by a neonatologist. These neonatologists may be hospital employees, independent contractors, or groups who also staff large subspecialty NICUs. The large number of board-certified neonatologists in the United States attests to the availability of these subspecialists.¹⁶ Their potential role as primary care "hospitalists" in pediatrics is in keeping with trends observed elsewhere in the healthcare system.¹⁷ Issues of reimbursement, although still being clarified, might be best addressed by assessing the level of service provided (eg, critical care, comprehensive care, or routine newborn care) rather than the specialty or subspecialty status of the individual provider.

In communities with multiple pediatric group practices and available neonatologists, primary (hospital-based) pediatric care can be arranged by the neonatologist. Although earlier manpower projections for neonatology^{18,19} did not suggest the present number of board-certified or practicing neonatologists as being necessary to practice tertiary, regionalized neonatal-perinatal medicine, the last decade has seen the production of alleged "excess" numbers¹⁶ such that current availability (3069 neonatologists certified by the American Board of Pediatrics)¹⁵ is twice the projected need (1479) in 1985. The assumptions previously used to estimate manpower needs in providing neonatal care¹⁸ were apparently inadequate in addressing at least four trends over the past decade: (1) an increasing number of live births (currently more than 4,000,000 per year, a greater than 5% increase over 1985 data); (2) a concomitant 29% decrease in the infant mortality rate (from 10.6 per 1000 live births in 1985 to 7.5 per 1000 live births), largely attributable to improved perinatal and neonatal care and the use of exogenous surfactants; (3) a greater than projected 1% to 2% attrition of neonatologists who have left clinical practice¹⁵; and (4) the dwindling number of other available neonatal care providers (fellows, residents, and even nurse practitioners).¹⁵

The involvement of neonatologists in primary newborn care has, within some systems, resulted in practice changes for pediatricians, freeing them for appointments in busy clinics by relieving them from attending cesarean sections and morning or evening rounds in the nursery. Such practices exist in military hospitals with neonatology services, health maintenance organizations with neonatology services, and academic practices.¹⁵ It places neonatologists where they can have the greatest impact on neonatal health in the most timely fashion, in the delivery room and throughout the first hours of neonatal transition. Outcomes should improve and costs be contained with effective resuscitation and timely interventions, the avoidance of unnecessary delays in diagnosis, and efficient transfer of sick newborns to an ICU bed or appropriate transport to subspecialty facilities with a full-service NICU.

The amount of neonatology training that residents in pediatrics receive has recently decreased. The 1996 Accreditation Council for Graduate Medical Education Residency Review Committee recommendations for pediatric training programs limits the amount of time that residents spend in both neonatal and pediatric ICUs; the total time in the NICU is generally limited to 3 to 4 months in a 3-year training program. Not only does this reduce the immediate manpower available to provide neonatal care, but it also diminishes the overall training and experience of soon-to-be-graduated general pediatricians. We can only speculate about the long-term results of these changes. However, with changes in payment systems, practice management and style,²⁰⁻²² regionalization and competition,^{23,24} and continued "lifestyle" issues for physicians in practice, more and more newborn care will be relinquished to primary care neonatologists.

... CONCLUSION ...

The neonatologist is the primary care physician for newborns with medical and surgical problems. The primary care foundations learned in pediatric residency and practice are of great value to neonatologists, and perhaps of even greater value to their patients. Developing trends in pediatric practice management and care for hospitalized newborns may help illuminate these primary care skills. These skills should be recognized and further developed by pediatric departments, community practitioners who both refer patients to neonatologists and receive patients from them, and by neonatologists themselves. Current manpower data and trends in neonatology training

within pediatric graduate medical education programs may obviate concerns that such recognition or development is untimely.

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