Special Article: Neonatal Health-care Policy: Promise and Perils of Reform

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Abstract
Health-care reform could generate major new opportunities to strengthen the central role of neonatology in improving child health in the United States. However, without considerable caution, such reform also could destabilize many of the policies that have facilitated neonatology’s most important contributions. This article anticipates the policy issues of greatest consequence for neonatology, including the public’s misperception of neonatology’s costs and impact on outcomes, the danger of adult-focused cost-containment policies, the potential to improve health services for women, and the generational politics of health-care reform. Neonatologists could provide essential technical guidance and a coherent political voice in shaping the nature and scope of health-care reform.

Introduction
Neonatology has much to gain and much to lose from health-care reform. Gains could result from reform that enhances the adequacy and stability of funding streams, supports quality improvement efforts, and significantly reduces the disastrous fragmentation of health services for women of reproductive age. However, health-care reform also could generate very real threats to some crucial elements of neonatal care on which many neonatologists have come to depend, including regionalized systems of care. This discussion outlines the possible promise and perils of health-care reform for neonatology, underscoring the potential for the next several years of policymaking to alter neonatal services and, therefore, neonatal outcomes for many years to come.

Addressing Neonatology’s Public Presence
A central rule of health policy is that advocating for enhanced access to any given intervention always depends on the public’s perception of the efficacy of the intervention. If the general perception is that the intervention makes little difference in determining outcomes, there is little incentive to ensure its equitable provision. This policy dynamic operates in virtually all arenas of health care and provides the context for assessing how neonatology might fare during a period of major health-care reform. Protecting what is working well in neonatology as well as seizing new opportunities for continued improvement depends at some basic level on policymakers believing that neonatology works.

From this policy perspective, neonatology has an image problem. Although very few data document how the general public views neonatology, particularly neonatal intensive care, assessment of its capacities and contributions may be somewhat clouded, if not confused. In some measure, this may be due to the tendency in the media to link neonatal intensive care with problematic cost and ethical issues, such as those raised by the recent case of octuplets born to a woman who had a complex social history via in vitro fertilization. In addition, the media’s need for dramatic visual images can emphasize the care of the most seriously ill, extremely preterm infants. Although many neonatologists have long advocated for greater preventive efforts, neonatology as a field does not harmonize well with the growing chorus in the policy world for greater emphasis on prevention as a means of reducing the costs of intensive therapies. Not surprisingly, in the policy world, neonatology too often is perceived as expensive, largely futile, and reliant on high-tech, nonpreventive interventions that often lead to serious, lifelong sequelae. This is not exactly a public perception of high effectiveness. Such a general perception in the

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policy world has the effect of devaluing the continued utility of neonatal intensive care and consequently can undermine advocacy pleas for enhanced access to it. It is, therefore, essential that health policy deliberations recognize the dramatic successes of neonatology and understand the deleterious consequences of any reduced commitment to its essential needs. Failure to do so inevitably makes neonatal services vulnerable to harmful or at least indifferent policy impulses.

Recognizing Neonatology’s Contributions to Child Health

The neonatal mortality rate has fallen dramatically over the past 3 decades. In 1980, 8.5 deaths occurred before the 28th day after birth for every 1,000 live births; by 2006, this figure had decreased almost in half to 4.5 deaths per 1,000 live births. (2) This record reflects great technical strides in the care of high-risk newborns and is one of the most dramatic reductions in the mortality rates of any age group ever recorded. (3)

Assessing Neonatology’s Impact on Neonatal Mortality

A critical question for policymakers is whether such a decline in neonatal mortality is due to a reduction in the risk status of babies being born or a reduction in mortality rates based on their respective risk status once born. Because gestational age or its general proxy in large datasets, birthweight, is so closely related to the risk of mortality in the neonatal period, neonatal mortality trends can be categorized into two components to address the policy question: trends in birthweight distribution and trends in birthweight-specific mortality (BWSM) rates. Such categorization is helpful in policy analyses because these two components can be linked to two different arenas of intervention. Changes in birthweight distribution are largely reflective of women’s health status, prenatal factors, and obstetric care during labor that influence whether a child is delivered preterm. BWSM rates generally reflect perinatal and neonatal care after the infant is born. (4)

The component of birthweight distribution that most directly relates to mortality and serious morbidity is the birth rate of very low-birthweight (VLBW) infants, generally defined as weighing less than 1,500 g at birth. Some elasticity can be seen in the relationship between birthweight and gestational age such that intrauterine growth may be higher or lower than expected for any gestational age. Although the use of birthweight as a proxy for gestational age should be purposeful, it still can

Figure 1. Neonatal mortality rate (NMR) and very low-birthweight (VLBW) birth rate by year in the United States, 1980 through 2006.

be employed as a general indicator of neonatal risk in population-based and policy analyses.

As shown in Figure 1, the neonatal mortality rate fell dramatically over the past several decades while the birth rate of VLBW infants rose. This suggests that the risk of neonatal mortality was decreasing while the birthweight distribution was deteriorating, implying that the primary driver of the falling neonatal mortality rate was improvements in BWSM rates.

Fig. 2 presents the BWSM curves for all infants born in the United States for three different time periods. All birthweight groups experienced major reductions, although the speed of improvement varied for different birthweight groupings. The major policy-based message generated by these data is that improvements in BWSM and, therefore, in perinatal and neonatal care, were the primary driving forces behind the dramatic reductions in neonatal mortality in the United States over the past several decades. Without the contribution of BWSM

Figure 2. Birthweight-specific mortality rates by years in the United States.
reductions, the already disgraceful international rank of the United States infant mortality rate would have been far worse (http://en.wikipedia.org/wiki/List_of_countries_by_infant_mortality_rate), dropping it by some 30 ranks and placing it somewhere between that of Costa Rica and Russia. Improvements in BWSM over the past several decades have benefited all social groups in the United States, although not always equally, and have been the only reason that absolute disparities in infant mortality in the United States have not worsened dramatically.

Assessing Neonatology’s Impact on Child Mortality

To gain some sense of the scale of neonatology’s impact, it is useful to place the improvements in neonatal mortality within the larger context of improvements in overall child survival. Figure 3 categorizes mortality trends for all children younger than 14 years of age between 1970 and 2005. Improvements in survival during the neonatal period accounted for approximately 61% of all improvements in child survival over this 35-year period. Although improvements in neonatal survival have slowed in recent years due to the concentration of mortality in the most extremely preterm infants, (5) the contributions of neonatology to improved childhood survival in the United States still have been dramatic.

Assessing Neonatology’s Impact on Child Morbidity

Many have expressed concern that neonatology’s role in reducing neonatal mortality has been associated with an increase in the number of high-risk newborns who survive the neonatal period but subsequently suffer from significant medical and developmental sequelae. (6) Major efforts have been made to reduce morbidity through improvements in the quality of obstetric and neonatal care, and their expansion should be supported through responsive policies. However, trends in morbidity among neonatal survivors are complex, (7) with the same advances that produced reductions in BWSM rates also producing reductions in birthweight-specific morbidity rates for previously high-risk birthweight categories, such as those between 1,000 and 1,500 g. This moving epidemiology has made it difficult to predict the impact of recent survival trends on the prevalence of childhood morbidity because one must wait a significant period to assess later outcomes. Accordingly, although the improved survival of preterm infants has increased the number of children who have medical and developmental problems, the extent is far smaller than generally perceived. The evidence that surviving preterm infants may experience subtle cognitive and behavioral deficits later in life (8) must be taken seriously and addressed through both preventive and therapeutic interventions, but there should be little confusion in the policy world that these new insights would present any fundamental challenge to the utility of neonatology in improving neonatal outcomes.

Regionalization

The remarkable success of neonatology reflects dramatic progress in technology and clinical expertise. However, such technology and expertise would have had little meaning were it not for the policies and programs that assured their widespread provision. The concept of organizing obstetric and neonatal services within geographic regions emerged in the late 1960s as an approach to maximizing access to and capacity of neonatal intensive care units (NICUs). (9) Different levels of care soon were shown to be associated with improvements in neonatal survival (10)(11) and were adopted as models for the organization of systems nationwide. (12) Initially, these efforts were led primarily by the voluntary efforts of health professionals, followed by involvement of some state health departments, and the system was widely credited with reducing neonatal and infant mortality rates. (13)

Despite the apparent success of perinatal regionaliza-
tion, evidence began to surface in the late 1980s that these systems were beginning to deregionalize. (14)(15) Amid reaffirmations of the importance of perinatal regionalization, (16) continued pressures on these systems resulted in an increase in VLBW infants being born in nontertiary-level hospitals and a proliferation of small NICUs competing for market share in the same region. (17) Although evidence on the influence of managed care is mixed, (18)(19) hospital competition and the impact of level II hospitals has been well documented. (20)(21) Greater insight into the appropriate role of level II hospitals is warranted, but it is clear that the regionalization of neonatal care should be seen as dynamic and likely to evolve as new interventions and the supply of specialty physicians and nurses expands. (22)(23)

Although establishing the appropriate standards for regionalized care should reflect the changing capacities of facilities in any given area, they should not reflect the changing adequacy of payment for any given population of patients. There is a danger that without careful attention, the evolution of regionalization could be based not on clinical decisions but financial ones, with the deregionalization of neonatal services driven by evolving patterns of insurance coverage and funding.

Epidemiology strongly suggests that the fastest method of widening disparities in neonatal and infant outcomes is to permit differential access to neonatal intensive care based on the ability to pay. (1) The data strongly contradict the concept that poor or minority children are better served by more preventive services and do not benefit greatly from neonatal intensive care. Moreover, regional systems that concentrate high-risk patients who have low-paying public insurance into a few major specialty care hospitals likely will not be sustainable. Through improved funding for Medicaid and related programs, health-care reform could help stabilize well-functioning regionalized systems by assuring adequate and stable funding streams. Such stabilization would require adequate support of public payors and provision of appropriate and less fragmented funding for related obstetric services than they currently receive.

**Sustaining Regionalized Neonatal Care**

Regionalized neonatal care systems are active processes that require sustenance in the form of supportive organizational policies, continuing education for involved professionals, and constant quality improvement efforts. Perhaps most important, however, is concerted vigilance that financial incentives do not overpower appropriate clinical decision-making. The remarkable record of neonatology in driving down national neonatal mortality rates depended on policies that facilitated and, at times, enforced regionalized systems of care. It is easy to forget the programmatic and policy struggles that accompanied the push to regionalize neonatal care, and such amnesia can make current regionalized networks vulnerable to policy shifts that are oblivious to the systems’ ongoing needs.

**Cost Containment Threatening Regionalized Neonatal Intensive Care**

If cost containment proves to be a threat to neonatal intensive care, it will not be because NICU care is so expensive; it will be because it is so cheap. Although appropriate ways to reduce expenses associated with NICU care should be sought, such care accounts for an exceedingly small portion of all ICU care, (24) much less all health-care spending. Most health-care expenditures are generated by adults, particularly the elderly. Figure 4 presents recent data on the expenditures associated with the major federal health programs and estimates of the Medicaid costs associated with the hospitalization of preterm infants in the United States. The costs associated with children, particularly preterm infants, are relatively small when placed in the broader context of overall public health-care expenditures.

When cost containment gains prominence, policies concerning children tend to be pushed to the periphery of policymaking. (25) The evidence that neonatal intensive care is cost-effective offers little protection from potential funding cuts, not because these studies lack credibility, but because they lack scale. Consequently, cost containment policy discussions become preoccupied with adult and particularly elderly health concerns. The threat to neonatology is that adult-focused cost containment strategies will so dominate health policy reform
that the special requirements of newborns and children will be ignored.

Of greatest concern is the special dependence of modern neonatology on regionalized specialty care services. Because serious illness is far less prevalent in children than in adults, pediatrics must concentrate patients into networks of regionalized centers with special expertise and resources. Adult care can tolerate far more decentralized services. It should not be surprising, therefore, that many cost containment strategies are being directed toward financial contracting networks that create strong disincentives for the use of specialty care facilities. Advancing highly regionalized neonatal care systems may prove increasingly difficult against a rising current of deregionalization based on adult-focused financial contracting.

**Neonatology’s Commitment to Women’s Health**

Neonatology should respond to the potential for health reform to help address the striking inadequacy of comprehensive health services for women of reproductive age. (26) Neonatology has had a laudatory record of supporting both clinical and public health strategies to improve birth outcomes, primarily through improvements in prenatal care. However, the evolving epidemiology of neonatal mortality and morbidity as well as the politics of health reform demand that neonatology move beyond its focus on the prenatal period and confront its relative lack of sustained commitment to the health of young women regardless of their pregnancy status.

Infant mortality reduction programs that attempt to initiate interventions only after pregnancy is recognized do not have much opportunity to prevent extremely preterm births. (27) The dramatic reductions in BWSM rates have concentrated current neonatal mortality into gestational ages of less than 25–6/7 weeks. Such concentration does not afford much of an opportunity for public health or clinical intervention, particularly given the requirements of addressing what are often complex risks, such as chronic medical conditions, adverse maternal behaviors, inadequate nutrition, or serious social needs, conditions likely to require prolonged interventions. A tight focus on prenatal care also tends to ignore the role of other reproductive health services, particularly contraception, in shaping pregnancy outcomes. Under virtually all current programs, young women become eligible for publicly financed health insurance and related services only when they become pregnant, and they are jettisoned out of the programs soon after birth. The promise of health-care reform to improve the provision of comprehensive health services to women of reproductive age deserves the attention and commitment of the neonatology community.

**Children and the Politics of Health-care Reform**

The current health-care reform deliberations have been constructed to expand health insurance coverage and reduce health-care costs. Although some view these two goals as being inherently contradictory, the political viability of any federal program to expand insurance coverage has been married to a pledge that it will not increase overall federal spending on health. The logic of this marriage is that a comprehensive health reform package should include mechanisms that generate greater efficiencies in health delivery systems, particularly in the large federal health programs such as Medicare and Medicaid. (28)

Many opportunities exist to reduce costs through greater efficiencies. However, there is also widespread skepticism that these can be accomplished, at least at the scale necessary to compensate for the costs associated with expanded and more secure insurance coverage. This has led to growing concern among elderly voters that any major health-care reform program ultimately will require major reductions in Medicare spending that will far surpass any savings created from greater efficiencies. The political dynamic inherent in these concerns has created important resistance to large-scale reform among those most concerned about Medicare and health-care benefits for the elderly. (29) Because this constituency represents such a powerful political force, some assurance must be provided that the requisite reductions in federal health-care expenditures will not greatly affect current Medicare benefits.

The political logic suggests that if major cuts in federal health-care spending are required and for political reasons cannot come from Medicare, the requisite savings must come from nonelderly components of Medicaid, the Children’s Health Insurance Program, or other funding streams that support health coverage for the populations younger than 65 years of age. Recent political experience has generated a painful lesson for the child health community: When the interests of the elderly are placed in conflict with those of the young, never bet on the young. (24)

**Summary**

Major health-care reform could provide many benefits to the neonatology community, but the demand for cost...
reductions also could create new challenges to funding streams of central importance to the provision of region-
alized neonatal care. The task for the neonatology com-
unity, as it is for all those concerned for the health and
well-being of children, is to create the technical guidance
and political voice to ensure that the special requirements
of young women, newborns, and children are repre-
sented adequately in the often fractious deliberations
over the future of health care in the United States.

American Board of Pediatrics Neonatal-Perinatal
Medicine Content Specification

- Know the issues in the organization of
  perinatal care (e.g., regionalization, transport quality-control, practice
guidelines).

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