The Dartmouth Institute for Health Policy & Clinical Practice

Dartmouth GEISEL SCHOOL OF MEDICINE

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ONCE SCARCE, NEONATAL INTENSIVE CARE PROLIFERATES

Dartmouth study finds nearly half of newborns in NICUs are normal birth weight

Is NICU care being driven by medical need or competition?

Hanover, N.H., September 4, 2019 --Once in short supply, neonatal intensive care units (NICU) are indispensable life savers for critically ill newborns, typically born premature with very low birth weight. But a new Dartmouth report finds that, following a robust national expansion of NICUs over the last two decades, nearly half of all newborns admitted to U.S. NICUs are of normal birth weight.

At the same time, nearly 15% of very low birth weight babies (less than 1500 grams/3.3 pounds) do not receive care in Level III or IV NICUs, despite evidence showing fewer deaths and complications for these newborns when they receive care in NICUs with the highest capabilities to treat very sick newborns, according to the report.

The Dartmouth Atlas of Neonatal Intensive Care offers the first comprehensive examination of U.S. neonatal care across large populations of newborns, using data from the National Center for Health Statistics of the Centers for Disease Control (CDC), Texas Medicaid, and Anthem Blue Cross Blue Shield commercial and Medicaid plans.

The report raises questions about how medical care is provided to our nation's newborns, particularly to those born premature or with other health problems. "Regardless of the infant population we studied, newborn and NICU care varied markedly across regions and hospitals. Little of the variation was explained by differences in newborn health needs. The care that similar newborns receive is strikingly different in one hospital compared to another," said principal author David C. Goodman, MD, MS, of The Dartmouth Institute for Health Policy & Clinical Practice at the Geisel School of Medicine at Dartmouth.

The supply of neonatal intensive care beds grew 65% from 1995-2013, according to the report. The supply of neonatologists grew even faster, increasing 75% from 1996- 2013. At the same time, the number of newborns has remained relatively stable. This has led to increasing numbers of lower risk newborns being admitted to NICUs.

The study finds that the growth in NICU care has not occurred where it is most needed. Regions of the country with a high proportion of premature newborns, or other factors related to newborn illness, such as maternal education level or the rate of cesarean sections, are not the regions with higher supply of NICU beds or neonatologists.

“We should not spare a dollar in providing the best care for newborns. But spending more doesn’t help infants if they could receive the care they need in a maternity unit or home with their mothers.” Goodman said. “It is very troubling that such a valuable and expensive health care resource is not distributed where it is needed.”

Thirty years ago, the most common newborn admitted to a NICU was of low birth weight. In 2017, normal birthweight babies accounted for 48.0% of NICU admissions.

Very low birth weight newborns who are born in hospitals with higher level NICUs (level III or IV) have lower mortality and fewer serious complications than if born in a hospital without a NICU or a Level II unit. Ensuring that more pregnant women deliver in hospitals with appropriate NICU capabilities is a goal of Health People 2020, our national blueprint for improving the nation’s health.

For very sick newborns, the benefits of NICUs clearly outweigh any risks. “But those with less severe illnesses have less to gain from intensive care yet are still exposed to the possible adverse effects of a hospital setting designed primarily for critical care,” the report states.

Potential adverse effects include:

- Many NICUs are relatively bright and noisy, while newborn sleep patterns and neurodevelopment depend on quiet and dim lights, particularly at night.
- Despite the best efforts of doctors and nurses, interactions between the newborn and mother are often affected, impairing maternal-newborn bonding and breastfeeding, and potentially leading to disruptions in newborn development and the risk of depression for mothers.
- Hospital-acquired infections and antibiotic use are also more likely, as are more frequent blood and imaging tests.
- Similar to any intensive care environment, errors in medication dose, mechanical ventilation, and feeding occur.

- Finally, when premature newborns are stable and growing, there are missed opportunities to transfer back to a hospital closer to home.

The report sheds light on growing concerns among some neonatologists about balancing these potential harms against possible benefits for late preterm and mildly ill newborns. “Identifying overuse could reveal opportunities to decrease adverse effects, reduce unnecessary spending, allow for earlier discharge home, and improve outcomes for newborns and their families,” the report notes.

The highest variation in regional NICU admission rates was seen in the normal birth weight (≥ 2,500 grams) newborns. Regions with low admission rates included Richmond, Virginia (1.6% of normal weight babies), Laredo, Texas (1.7%), Valdosta, Georgia (1.7%), Roanoke, Virginia (1.8%), and Corpus Christi, Texas (1.8%). Regions with the highest rates included Newark, Delaware (9.2%), Alexandria, Louisiana (9.0%), El Paso, Texas (8.9%), Stony Brook, New York (8.3%), and Staten Island, New York (8.1%).

The report raises questions about the nation’s spending on perinatal care, among them:

- Is the NICU boom being driven by medical need or by competition among hospitals for newborns and the high margins they earn when some of those newborns are admitted to NICUs?
- Are mildly ill newborns receiving care they need and their families want, or is care induced by the increasing availability of NICU beds?
- Higher use of NICU care does not change the nation’s fundamental problem of poor newborn outcomes at the time of birth. Have we over invested in NICUs and under invested in women’s reproductive health services?

Most NICUs are “high-margin” services for hospitals. A 2013 March of Dimes study reported that hospitalization costs average $54,000 for preterm infants. An article in Managed Care magazine in 2010 reported that NICU care accounts for 75 percent of all dollars spent for newborn care. This is a strong financial incentive for further building and expansion of NICUs and for keeping those beds full, potentially leading to overuse of services, especially in lower-risk newborns.

In Texas, for example, the cost to Medicaid for newborn care in 2014 was $1.1 billion, with newborns requiring special care (i.e., elevated care in either a NICU or a maternal-newborn care unit) accounting for 85% of the total. Most (85%) of the payments were for facility charges (i.e., hospitals), with the balance accounted for by professional services, primarily physician bills.

Preliminary analyses failed to find either benefit or harm in the markedly different NICU length of stay, the report notes. “If confirmed in further studies, there are opportunities to reduce the intensity of care and payments and to increase the value of newborn care across the nation,” the report states.

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About The Dartmouth Institute for Health Policy & Clinical Practice

The Dartmouth Institute for Health Policy & Clinical Practice was founded in 1988 by Dr. John E. Wennberg as the Center for the Evaluative Clinical Sciences (CECS). Among its 25 years of accomplishments, it has established a new discipline and educational focus in the Evaluative Clinical Sciences, introduced and advanced the concept of shared decision-making for patients, demonstrated unwarranted variation in the practice and outcomes of medical treatment, developed the first comprehensive examination of US health care variations (The Dartmouth Atlas), and has shown that more health care is not necessarily better care.

About Dartmouth Geisel School of Medicine

Founded in 1797, the Geisel School of Medicine at Dartmouth strives to improve the lives of the communities it serves through excellence in learning, discovery, and healing. The Geisel School of Medicine is renowned for its leadership in medical education, healthcare policy and delivery science, biomedical research, global health, and in creating innovations that improve lives worldwide. As one of America's leading medical schools, Dartmouth's Geisel School of Medicine is committed to training new generations of diverse leaders who will help solve our most vexing challenges in healthcare.