How to Manage NICU Costs in Medicaid



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Introduction

A critical challenge for the nation's health plans and provider organizations in the coming years will be the effective management of costs and outcomes for Medicaid maternity populations.

Costs for pregnancy, delivery and newborn infants make up a significant percentage of total Medicaid spend.[1] A noteworthy percentage of this cost is related to adverse outcomes of pregnancy that lead to a neonatal intensive care (NICU) admission.[2] Medicaid mothers experience a higher percentage of adverse newborn outcomes than mothers in the commercial population.[3] They are more likely to have a preterm or low birth weight infant,[4] and their pregnancies are more likely to result in an admission to the neonatal intensive care unit (NICU).[5]

Effectively managing the care of infants in a NICU has always been a challenge for managed care organizations. NICU cases are often complex and require skilled expertise to understand opportunities for clinical impact and management.

In this white paper, neonatologist Mike Kornhauser, MD, and Norm Ryan, MD, explore how a NICU care management program can reduce cost and improve outcomes for infants requiring a NICU admission. Dr. Kornhauser has 20 years of experience with academic practice and ran the Alere Health NICU Care Management Program for 18 years. As senior vice president of health intelligence, Dr. Ryan currently oversees analytics and clinical product development for Alere Health.

Staggering Cost and Incidence of Adverse Birth Outcomes in Medicaid Pregnancies

Medicaid covers nearly half of the 4.3 million births[6] that occur in the United States each year. It's an astounding number that presents a challenge for health plans and states that serve and administer Medicaid programs.

A higher percentage of Medicaid mothers experience births that have adverse infant outcomes compared to mothers in a commercial population. *Out of 1,900 Medicaid mothers in a study conducted by OptumInsight, 22% experienced an adverse newborn outcome, compared to 12-13% in the commercial population.*[7]

This study found that the *cost of healthcare services provided to a mother and her baby in a single adverse pregnancy can approach $57,000, nearly seven times the cost of a normal or "uncomplicated" birth funded by Medicaid*. Of the 425 adverse birth outcomes in the study, 164 babies spent time in the NICU. The average cost for an NICU stay alone was $40,000 with an average NICU length of stay of 18 days.

Alere Health's benchmark data also suggests a similar picture. *Medicaid births have a 20% greater chance of NICU admission compared to commercial mothers, a 48% greater chance of having a low birth weight infant* (<2500 grams) and a 37% higher rate of preterm birth.[8]

These high costs, high rates of preterm birth and adverse outcomes that lead to high rates of NICU admissions have influenced a number of state Medicaid agencies to start focusing on improving the quality and continuity of care delivered to women of childbearing age.[9]

Managing the pregnancy to a better outcome is not by itself enough to reduce the cost burden of expensive NICU admissions. Many NICU admissions are unavoidable or not anticipated. Additionally, the fact remains that the preterm birth rate (often leading to NICU admission), though slowly improving in the United States, is still higher than that observed in the 1990s.[10] Other data sources indicate that NICU admission rates, as well NICU length of stay, have remained steady over a recent eight-year period.[11]

Therefore, management of the NICU admission itself, in conjunction with maternity management, is important if Medicaid programs are going to fully realize financial savings and improved outcomes in their maternity/newborn populations.

Factors Linked to Medicaid NICU Cost

Clearly, a major factor contributing to the high NICU cost in Medicaid populations is the high birthrate (*the rate for women in poverty is typically double that in a commercial population*),[12] coupled with the high NICU admission rate. This creates a significant cost burden for Medicaid health plans. Alere Health internal analysis of managed Medicaid claims indicates that NICU cost averages 15-25% of total maternal/newborn spend for a typical managed Medicaid plan.[13]

Multiple maternal clinical factors often relevant in Medicaid populations can potentially negatively affect infant birth outcomes. Many of these factors can be addressed through maternity risk assessment and case management programs, and include:

- Poor health during preconception period[14]
- Lack of continuity of care[15]
- Unintended pregnancies[16]
- Neighborhood effect/environmental factors[17]
- Psychosocial and medical factors[18]

Once an infant is admitted to the NICU, a variety of factors beyond the infant's underlying medical condition are associated with practice variation with potential to affect NICU outcomes and cost, whether in commercial or Medicaid populations. These include:

- NICU census and staffing[19]
- Temporal changes in care[20]
- Variation in practice among different institutions or regions of the country[21]

Medicaid populations tend to have additional challenges that may affect, directly or indirectly, the NICU course, including:

- Home support and psychosocial issues [22]
- Effect of maternal health upon the infant[23]
- Differences in care practices in Medicaid vs. non-Medicaid populations[24]

Solution for Health Plans

An effective pre-conception and maternity case management program is the first step in promoting healthy pregnancy and minimizing excessive NICU expense. However, many NICU admissions cannot be prevented and in those cases, a comprehensive NICU program is necessary to promote better outcomes, more efficient NICU care, enhanced family/caregiver involvement, reduced NICU readmissions, and financial savings. Understanding the factors that influence NICU expenses and incorporating operational practices, tools, and clinical guidelines that foster best practices can help ensure better outcomes while reducing costs.

Key components of an effective and comprehensive NICU case management program for Medicaid members include:

- PROGRAM STAFFING BY NICU RNS WHO FUNCTION AS CASE MANAGERS, with additional focus on care coordination and discharge planning. They must understand the specific risks and approaches in Medicaid populations. It is essential that these RN case managers understand local community resources and support services that can help foster a safe and timely discharge. In addition, the RN case managers facilitate parental education and awareness of resources. A multidisciplinary approach is important, including medical support by neonatologists, who help direct case management efforts.
- EARLY AND FREQUENT TOUCH POINTS BY NICU CASE MANAGERS. This includes both reviews of the infant case trajectory to promote efficient advancement in the plan of care and interventions with families to promote visitation, participation in care and readiness for discharge. Alere Health data of managed NICU cases indicates that earlier involvement with the patient and family during the NICU stay is associated with shorter time to reach discharge milestones and shorter NICU length of stay.[25]
- DEVELOPMENT OF A LONGITUDINAL RELATIONSHIP WITH FAMILIES DURING THE NICU STAY. The average NICU length of stay is two to three weeks. During that time, it is possible to meet families on multiple occasions, as the hospital acts as a nexus for visitation. Alere Health managed NICU case data indicates it is possible to have a high (> 80%) success rate in speaking frequently with Medicaid families of complex NICU infants during the hospitalization.[26] Trust and advocacy gained from these conversations can also lead to comparable success in post-discharge follow-up conversations with families.[27] The importance of this is related to the high rate of readmission for infants in a NICU compared to non-NICU infants. Clearly, the ability to successfully contact families post-discharge from a NICU for on-going case management efforts is important to mitigate this risk.
- CLOSE COORDINATION OF CASE MANAGER EFFORTS IN CASES WHERE THERE ARE BOTH MATERNITY AND NICU CASE MANAGEMENT PROGRAMS. In maternity cases that are highly likely to lead to a NICU admission (e.g., multiple gestation pregnancies, known fetal anomalies, etc.), ideally, the NICU case manager is introduced to the pregnant member or family prior to delivery. This can help expedite developing a relationship between the family and case manager, and facilitate early communication during the NICU course.

Key components of an effective and comprehensive NICU case management program cont.

- **A COMPREHENSIVE NICU DATABASE TO FACILITATE ACTIVE MANAGEMENT.** At the patient level, this should act as a decision support tool for case managers to identify practice inefficiency and promote timely management, with embedded clinical guidelines. Besides clinical information, the database should also include environmental and contact information for all potential family members and caregivers to facilitate post-discharge follow-up; this is especially important in Medicaid populations. Alere Health experience utilizing such a proprietary database is that multiple care processes can be monitored and acted upon at the individual patient level. At the aggregate level, the database can measure individual NICU practice patterns, and demonstrate improvements in the clinical case trajectory associated with case management efforts.
- **MATERIALS FOR FAMILIES THAT ARE READING LEVEL APPROPRIATE AND ACT AS A GUIDE** for families in understanding their infant's course of care, expected milestones, and activities they need to do to prepare for NICU discharge. The NICU environment is foreign and can restrict family access;[28] appropriate educational materials can alleviate some of these issues.[29] Alere Health has found value in a specific tool derived from its database, which outlines key gestational age dependent milestones for NICU infants. This gives families a sense of what to expect during the NICU course and how they can most fully participate in their infant's care.
- **PROGRAM FLEXIBILITY IN DRG PAYMENT ENVIRONMENTS.** Many Medicaid payers pay hospitals utilizing diagnosis-related (DRG) groups for NICU patients. The opportunity for financial savings for these infants is primarily in those who become DRG cost or length of stay "outliers". To maximize case management efficiency and efficacy in a DRG environment, it is important that a NICU case management program have specific operational and patient identification methods to direct case management efforts towards those patients more likely to become outliers. One tool Alere Health has used in this regard is a proprietary NICU length of stay predictor, which can facilitate early identification of patients likely to have extended NICU length of stay and cost.

Overall, these specific program attributes must function as a cohesive whole, and work with hospital providers in collaborative and value-added fashion to improve the NICU case trajectory – and not merely duplicate what is happening in NICUs currently. The ability of a NICU case management program to help the hospital team speak with families, set up discharge, maintain family contact post-discharge, and provide the hospital team feedback on outpatient outcomes are important program attributes, particularly relevant in Medicaid populations.

This result of an integrated team approach has a direct effect on overall NICU cost by ensuring appropriate levels of care and a more efficient hospital course, leading to decreased length of stay and decreased readmission rates. It also results in safer discharge by preparing families or caregivers with the appropriate resources and education to care for their infant properly.

About Alere Health's NICU Program

The Alere Health NICU Care Management Program provides the key aspects for effective management for Medicaid members as outlined, and has provided services for more than 150,000 infants in a NICU over the past 18 years.[30] The program has managed infants in more than 1,500 hospitals in the United States in all 50 states, on behalf of greater than 80 different health plans and employers during this time.[31]

Alere Health's board-certified neonatologists and experienced, certified NICU nurse care managers, backed by powerful decision support tools and years of operational experience, are able to support and promote efficient NICU care practices and family involvement with their child during and after the NICU stay. These efforts lead to improved clinical outcomes, financial savings and high family satisfaction.

Specific to Medicaid populations, Alere Health recent experience indicates:[32]

- Reduction by 9% in hospital length of stay
- Level of care payments reduced to only 18% of NICU days being paid at the highest NICU revenue code
- More than 30% reduction in readmissions after NICU discharge
- Greater than 95% family satisfaction, with high contact rates during and after the NICU stay
- Return on investment > 2:1

Contact Us

To learn how Alere Health can reduce your costs associated with preterm births, contact us at (877) 793-3651 or email us.

About the Authors



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REFERENCES

1 U.S. Agency for Healthcare Research and Quality, HCUPnet, Healthcare Cost and Utilization Project, Rockville, MD: AHRQ, Available at: http://hcupnet.ahrq.gov/

2 Alere Health's business opportunity analyses sourcing client-provided medical claims and eligibility data.

3-5 National Comparison Data was obtained specifically for Medicaid and Commercial/Tricare/HMO payors, from an analysis conducted by the National Perinatal Information Center. Hospital discharge records representing 168,727 inborn infant admissions during 2012 were aggregated by hospitals, states and/or regions so that specific individuals or establishments could not be identified. Participating hospitals represent a weighted sample in an effort to best represent a national population of births.

6-7 OptumInsight, "The High Cost of Adverse Birth Outcomes in Medicaid Programs (Part2)," 2012

8 Same as Ref. 3-5

9 The Commonwealth Fund, "Addressing Women's Health Needs and Improving Birth Outcomes: Results from a Peer-to-Peer State Medicaid Learning Project," Vol. 21, August 2012

10 National Vital Statistics Systems (NVSS), Vol. 64, No. 1, January 15, 2015

11 See Ref. 3

12 a) US Census Bureau, "Fertility of Women in the United States," July 2012; b) American Journal of Public Health, "Shifts in Intended and Unintended Pregnancies in the United States, 2001–2008," Supplement 1, Vol. 14, No. S1, 2014

13 Alere Health's business opportunity analyses sourcing client-provided medical claims and eligibility data.

14 National Governors Association, "Improving Birth Outcomes in Medicaid," 2013

15 The Commonwealth Fund, "Addressing Women's Health Needs and Improving Birth Outcomes: Results from a Peer-to-Peer State Medicaid Learning Project," by Kay Johnson, Vol. 21, August 2012

16 a) Guttmacher Institute, "Unintended Pregnancy in the United States Fact Sheet," January 2015 b) Maternal Child Health Journal, "Intention to Become Pregnant and Low Birth Weight and Preterm Birth: A Systematic Review," Vol. 15:205–216, 2011; c) See Ref. 15

17 Seminars in Perinatology, "Racial Disparities in Preterm Birth," Vol. 35:234-239, 2011

18 a) Journal of Women's Health, "Medicaid and Preterm Birth and Low Birth Weight: The Last Two Decades," Vol.19, No. 3, 2010; b) Maternal Child Health Journal, "Racial Disparities in Economic and Clinical Outcomes of Pregnancy Among Medicaid Recipients," Vol. 17:1518–1525, 2013 c) See Ref. 17

19 Pediatrics, "Neonatal Intensive Care Unit Census Influences Discharge of Moderately Preterm Infants," Vol. 119:314-319, 2007

20 a) Archives of Gynecology and Obstetrics, "Infant Births during the Internal Night are at Increased Risk for Operative Delivery and NICU Admission," Vol. 284:65-71, 2011; b) Pediatrics, "The Timing of Neonatal Discharge: An Example of Unwarranted Variation?" Vol. 107, No. 1, January 2001

21 a) Journal of Perinatology, "Practice Variation in Suspected Neonatal Sepsis: A Costly Problem in Neonatal Intensive Care," Vol. 25:265-269, 2005; b) Pediatrics, "Variation in Diagnosis of Apnea in Moderately Preterm Infants Predicts Length of Stay," Vol. 127, No. 1, January 2011

22-23 Preconception and Interconception Health Status of Women Who Recently Gave Birth to a Live-Born Infant --- Pregnancy Risk Assessment Monitoring System (PRAMS), United States, 26 Reporting Areas, 2004

24 Pediatrics, "Are Outcomes and Care Processes for Preterm Neonates Influenced by Health Insurance Status?" Vol. 124:122, 2009

25 Alere Health Medicaid Population Management Results for 2012 and 2013. The following were compared between earlier involvement (defined as receiving a referral within 2 business days of NICU admission) and later involvement (defined as referrals received 3 or more days after NICU admission) cases: feeding progression (days to start feeds, full feeds, first PO feed, full PO feeds), post-menstrual age at open crib, discharge readiness, NICU length of stay.

26-27 Alere Health Medicaid Population Management Results for 2012 through 2015. Complex NICU infants defined as length of stay >10 days.

28 Neoreviews, "Parents as the Primary Caregivers for Their Infant in the NICU: Benefits and Challenges," Vol. 15:e472-e477, 2014

29 a) Advances in Neonatal Care, "Implementing Family-integrated Care in the NICU: A Parent Education and Support Program," Vol. 13(2):115-26, April 2013; b) Patient Education and Counseling, "Information Needs of Parents of Children Admitted to a Neonatal Intensive Care Unit: A review of the Literature (1990–2008), Volume 76, Issue 2, Pages 159-173, August 2009

30 Based on patient counts for infants managed in Alere Health NICU program since 1998.

31 Based on counts of unique state hospitals, and their locations, documented in Alere Health NICU Care Management system since 1998.

32 Alere Health Medicaid Population Management Results for 2014. Reduction in hospital NICU length of stay is made from a comparison of actual managed length of stay to each Medicaid client's benchmark length of stay. This data is compared to actual fees to derive the return on investment. Reduction in level of care payments paid at the highest NICU revenue code is based on Alere's clinical recommendations made throughout management of each case regarding the most appropriate level for each day. Readmission reduction derived from comparison to the rehospitalization rate as reported in Escobar et al "Rehospitalization in the first two weeks after discharge from the neonatal intensive care unit", Pediatrics 1999;104;e2 located at: http://pediatrics.aappublications.org/content/104/1/e2.full.html. Family satisfaction surveys performed and reported by 3rd-party vendor.