

Episode overview: Pregnancy, Delivery, Neonatal Intensive Care

Pregnancy, delivery, and Neonatal Intensive Care (NICUs) comprise one of several clinical areas prioritized for possible inclusion in the 2012 Arkansas Payment Improvement Initiative. This working paper summarizes the core concepts of this episode and explores the potential challenges and implications of adopting an episode-based payment across five topic areas:

- *Overview of pregnancy, delivery and NICU*
- *Baseline utilization and cost patterns*
- *Quality, patient experience, and efficiency*
- *Clinical, operational, and financial challenges*
- *Key design decisions for new payment model(s)*

This document will be refined with input from participants in the Pregnancy, Delivery and NICU Workgroup, independent experts and other interested parties.

OVERVIEW OF PREGNANCY, DELIVERY AND NICU

Prenatal care

Prenatal care is the range of tests, procedures, and other services performed during pregnancy to promote the birth of a healthy baby with minimal health risk to the mother.

Pregnancies can be characterized as low-risk or high-risk. High-risk pregnancies can involve underlying maternal conditions as well as complications arising during pregnancy, such as gestational diabetes, multiple-births, history of pre-term birth, and preeclampsia.

Routine prenatal care includes basic screenings, identification and management of risk factors, and counseling, which are typically provided in an outpatient setting.

In pregnancies with risk factors and complications, routine care is supplemented with more active management of clinical risk factors. Depending on risk severity, interventions can occur either in an inpatient or outpatient setting. Telehealth is becoming an increasingly valuable adjunct to high-risk management in rural settings.

Obstetrician-gynecologists (OB/GYNs) provide the vast majority of prenatal care in the United States. In Arkansas, family practice physicians, nurse

practitioners, and certified nurse mid-wives are important providers of prenatal and obstetrical care.

Delivery

Delivery services refer to the procedures associated with labor delivery and care for the mother immediately following birth.

Delivery ideally occurs between 39 and 41 weeks and can be spontaneous in onset or induced. Medical and physical conditions such as preeclampsia, gestational diabetes, placenta previa, hemorrhage, and infections may dictate delivery timing and method.

The vast majority of deliveries in the United States occur in a hospital. In addition to the providers outlined above, other health professionals such as anesthesiologists, pediatricians, labor delivery nurses, and NICU nurses may be involved in delivery services.

Neonatal care

Neonatal care, like pregnancy care, varies depending on the health of the newborn.

Neonatal care occurs in different levels of nurseries and NICUs, with level of support ranging from basic nursery care for healthy full-term babies, to highly-sophisticated equipment and specialists who can care for infants of all gestational ages in higher-level NICUs.

BASELINE UTILIZATION AND COST PATTERNS

Of the estimated 40,000 live births in Arkansas per year, approximately 13%ⁱ are premature (before 37 weeks), about 9%ⁱⁱ are low birthweight (<5.5 pounds), and an estimated 2%ⁱⁱⁱ are very low birthweight (<3.3 pounds). The cost of pregnancy, delivery, and neonatal care within Arkansas' Commercial and Medicaid populations is estimated to be approximately \$400 million per annum.^{iv}

Commercial payers account for approximately 30%^v of the costs of pregnancy, delivery, and NICU services in Arkansas and Medicaid covers about 70%.^{vi} These costs comprise a significant portion of state health care costs; approximately 10 percent of Medicaid clinical spend and about 5 percent of commercial clinical spend is dedicated to perinatal care.^{vii}

The highest concentration of cost across pregnancy, delivery, and NICU is in inpatient costs (72%), followed by physician and specialist fees (23%), outpatient care (3%), and ancillary providers (2%).^{viii}

QUALITY, PATIENT EXPERIENCE, AND EFFICIENCY

An examination of clinical and economic literature, combined with expert interviews suggests opportunity to ensure quality, patient experience, and efficiency for pregnancy, delivery and NICU. The most meaningful opportunities are:

1. More effective prenatal care

Targeted prenatal care can potentially lower Arkansas' preterm birth and low birthweight rates. Reduction in prematurity not only can reduce the cost of neonatal care, but also subsequent cost in Arkansas for developmental disabilities and educational challenges.

Comprehensive prenatal care should include effective testing to identify high-risk patients at risk for preterm birth and/or low birthweight infants so they can be managed with targeted interventions, such as smoking cessation, substance abuse counseling, gestational diabetes management, and progesterone for women with a history of pre-term birth.^{ix,x}

2. Decrease utilization of elective procedures

Arkansas has the 13th highest rate of c-sections in the nation (34.6% v. 32.9% national average).^{xi} C-sections as a procedure place the mother at greater surgical risk and are more costly than vaginal births.

Arkansas' c-section rate has increased over the last decade and varies significantly within the state, with about 1.5x variation between the metropolitan areas with the highest and lowest rates (42% vs. 28%).^{xii} Analyses also suggest opportunity to decrease Arkansas' statewide early elective delivery rate, estimated to be 26%.^{xiii}

3. Ensure delivery in facilities with NICU appropriate for level of prematurity

Increasing the number of very premature births that occur in hospitals with the appropriate level of NICU may improve neonatal outcomes. A study on prematurity in Arkansas suggests that very premature infants in Arkansas have significantly higher survival rates when delivered in a facility with on-site neonatal and maternal fetal medical specialists.^{xiv} Additionally, very low birthweight infants have higher mortality rates when transferred from a lower level NICU to a higher-level NICU post-delivery.^{xv,xvi}

4. Increase operational efficiency of NICUs

NICUs provide technological services for high-risk newborns. There is opportunity to standardize best practices in resource use to address variation in service intensity for neonates of similar gestational age and medical condition.

In addition to these opportunities to optimize pregnancy care delivery, quality, and outcomes, we recognize that there is also potential within Arkansas to reduce unwanted pregnancies, initiate earlier prenatal care for high-risk mothers, and enhance intrapartum pregnancy planning and maternal support. These opportunities, however, are less likely to be directly addressed via an episode model.

CLINICAL, OPERATIONAL, AND ECONOMIC CHALLENGES

Although there is significant opportunity to ensure quality, patient experience, and efficiency within the pregnancy, delivery and NICU episode, several challenges will need to be addressed. These include the need to ensure patient adherence to perinatal care guidelines and counseling and to promote greater care coordination to optimize outcomes for high-risk pregnancies.

KEY DESIGN DECISIONS FOR NEW PAYMENT MODEL(S)

Following is a non-exhaustive list of the key design decisions that Medicaid, Medicare, and Commercial health insurers will need to make (either jointly or individually) in arriving at their new payment model(s) for pregnancy, delivery, and NICU.

- 1. Episode definition:** *clearly indentifying when an episode begins and ends, which services are included; and criteria for patient inclusion/exclusion based on demographics, health status, diagnoses/procedures, and geographic regions*
- 2. Payment model:** *prospective payment of a single bundled amount vs. retrospective payment that rewards high-performing providers; criteria for including providers based on scale, capabilities, performance, or other factors; pricing model to adjust for clinical severity, patient and/or provider geography, or other factors; level of financial risk (upside/downside)*
- 3. Administrative enablers:** *requirements for data exchange, performance reporting back, and/or management of inter-party financial flows necessary to enable new payment model*

ⁱ Centers for Disease Control and Prevention, Arkansas Fact Sheet, 2009.

ⁱⁱ Centers for Disease Control and Prevention, Arkansas Fact Sheet, 2009.

ⁱⁱⁱ National Center for Health Statistics, final natality data. Retrieved October 11, 2011 from www.marchofdimess.com/peristats.

^{iv} Medicaid claims data SFY2010; Arkansas commercial payer's spend per episode (Jan 1 2008 – Dec 31 2010)

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- ^{vii} Medicaid claims data SFY2010; Arkansas commercial payer's spend per episode (Jan 1 2008 – Dec 31 2010)
- ^{viii} Medicaid claims data SFY2010
- ^{ix} Tita, AT, Rouse DJ. Progesterone for preterm birth prevention: an evolving intervention. *Am J Obstet Gynecol.* 2009; 200:219.
- ^x Hueston, WJ, Quattlebaum, RG, Benich, JJ. How much many can early prenatal care for teen pregnancies save? *Journal of the American Board of Family Medicine.* 2008; 21(3): 184-190.
- ^{xi} National Vital Statistics System (2009).
- ^{xii} HSAG analysis for Arkansas Division of Medicaid Services, SFY2011
- ^{xiii} Data collected via AFMC AMART system. Discharged between 07/01/2010 and 12/31/2010 for Arkansas providers participating in IQI program SFY2011
- ^{xiv} Nugent R, Golden W, Hall W, Bronstein J, Grimes D, Lowery C. Locations and outcomes of premature births in Arkansas. *The Journal of the Arkansas Medical Society;* 2011; 107(12):258-9.
- ^{xv} Cifuentes J, Bronstein JM, Phibbs CS, Phibbs RH, Schmitt SK, Carlo WA. Mortality in low birthweight infants according to level of neonatal care at hospital of birth. *Pediatrics.* 2002; 109(5):745-51.
- ^{xvi} Lasswell S, Barfield W, Rochat R. Perinatal Regionalization for Very Low Birth-weight and Very Preterm Infants: A Meta-analysis. *JAMA.* 2010;304(9):992-1000.