The Pediatrix BabySteps® Data Warehouse and the Pediatrix QualitySteps Improvement Project System—Tools for "Meaningful Use" in Continuous Quality Improvement

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- Clinical Data Warehouse

The election of the President Obama in 2008 brought the issue of health care reform to the forefront as part of the administration's agenda. Underlying much of the discussion about improvement in access to health care is the concept that significant change could be implemented with the broader use of electronic medical or health care records (EMR/EHRs). What has been less clear, however, is how EHRs can directly facilitate actual improvement in patient outcomes. To address this issue, the concept of *meaningful use* was also introduced to providers interested in receiving incentive payments from the federal government to establish EHRs, although the phrase was

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initially not well defined. The Department of Health and Human Services Web site in June 2009 stated the following:

> *To receive the incentive payments, providers must demonstrate ''meaningful use'' of a certified EHR. Building upon the work done by the HIT Policy Committee, the Centers for Medicare & Medicaid Services (CMS), along with the Office of the National Coordinator for Health Information Technology (ONC), will be developing a proposed rule that provides greater detail on the incentive program and proposes a definition of meaningful use.*[1]

Subsequently, the Health Information Technology (HIT) Policy Committee developed a phased implementation of meaningful use for the years 2011 to 2015 in the following categories:

- Improve quality, safety, and efficiency, and reduce health care disparities
- Engage patients and families
- Improve care coordination
- Improve population and public health
- Ensure adequate privacy and security protection of personal health information.[2]

In 1996, Pediatrix Medical Group anticipated this issue and began to develop several modalities for care delivery in the neonatal intensive care unit (NICU) that would permit true meaningful use of electronic data collection. A proprietary EHR was initiated to provide a daily medical record note for practicing physicians within the organization. The EHR, initially known as *RDS*, was a modification of an already existing electronic record, and was subsequently replaced by a proprietary system that was developed in-house, called *BabySteps*.

This EHR also served as a tool for data gathering on a rapidly expanding patient population (Pediatrix Medical Group currently cares for approximately 20% of all NICU patients in the United States), while creating a system that would accurately code for the delivery of care according to guidelines developed by the American Academy of Pediatrics Perinatal Section Coding Committee. More importantly, however, serious consideration was given to extracting data from the database that was being developed, ultimately giving rise to the Pediatrix BabySteps Clinical Data Warehouse (CDW). Currently, the CDW is believed to be one of the largest repositories of data on neonates, containing detailed information on more than 600,000 infants and approximately 11,000,000 patient days. Because of the extent and depth of the data collected, it has been queried not only within the organization for novel research observations, but also by the US Food and Drug Administration (FDA), the National Institutes of Health (NIH), and the National Institute of Child Health and Human Development (NICHD), and several academic neonatology programs.[3–6] Many of these queries have resulted in publication in peer-reviewed literature.

Most recently, these tools were complemented by a new electronic module dedicated specifically to clinical quality improvement (CQI) initiatives, known as the QualitySteps System, or Quality Improvement Project System. The QualitySteps System is designed to allow the user to define an area for quality improvement, support a project with dedicated evidence-based literature, measure outcomes to be evaluated, enter and track data with annotated run charts, and then reassess outcome improvement (the Plan, Do, Study, Act cycle for quality improvement). This article describes these tools in detail to provide an understanding of their structure and how they have fulfilled the concept of ''meaningful use'' for true outcome improvement in the NICU.