Advancing Children's Health Care and Outcomes Through the Pediatric Quality Measures Program

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ABSTRACT

In 2009 Congress passed the Children's Health Insurance Program Reauthorization Act (CHIPRA), which presented an unprecedented opportunity to measure and improve health care quality and outcomes for children. The Agency for Healthcare Research and Quality, in partnership with the Centers for Medicare & Medicaid Services, has worked to fulfill a number of quality measurement provisions under CHIPRA, including establishing the Pediatric Quality Measures Program (PQMP). The PQMP was charged with establishing a publicly available portfolio of new and enhanced evidence-based pediatric quality measures for use by Medicaid/Children's Health Insurance Program and other public and private programs and to also provide opportunities to improve and strengthen the Child Core Set of quality measures. This article focuses on the PQMP and provides an overview of the program's goals and related activities, lessons learned, and future opportunities.

KEYWORDS: children; quality

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IN THIS ARTICLE, we provide an overview of the Pediatric Quality Measures Program (PQMP), its goals and related activities, lessons learned, and future opportunities.

HISTORY AND BACKGROUND

THE CHILDREN'S HEALTH INSURANCE PROGRAM REAUTHORIZATION ACT: FOCUS ON HEALTH CARE QUALITY

The Children's Health Insurance Program Reauthorization Act (CHIPRA) of 2009 provided a unique opportunity to direct resources and national attention to pediatric quality measurement and standardized reporting as important steps toward improving care and health outcomes for children.[1] Until passage of CHIPRA, measurement of the quality of health care for children had lagged substantially with most health care quality and payment reform efforts focused on adults, in particular the elderly and Medicare.[2–5] Currently more than 1 of 3 children in the US are enrolled in the country's major public programs, Medicaid/Children's Health Insurance Program (CHIP), and approximately $120 billion was spent on health care for children, in 2011.[6,7] Therefore, ensuring a high-quality system of care for children has garnered national attention and aligns with The National Quality Strategy, which is the first overarching national policy aimed at providing better, more affordable care for individuals and their communities.[8]

Title IV of CHIPRA focused on "strengthening quality of care and health outcomes" for children with a number of provisions relating specifically to the development and use of quality measures.[1] These included an Institute of Medicine report on child health and health care measurement, demonstration programs consisting of awards to states to improve health care quality and delivery systems for children in Medicaid/CHIP, development of an Electronic Health Record format for children's health care, the identification of an Initial Child Core Set of quality measures for voluntary use by state Medicaid/CHIP programs with required annual updates, and the establishment of the PQMP by January 2011.[1,9,10]

PQMP

As outlined in the Title IV legislation, the broad goals of the PQMP are 1) to establish a publicly available portfolio of new and enhanced evidence-based pediatric quality measures for use by Medicaid/CHIP and other public and private programs, and 2) to provide opportunities to improve and strengthen the Child Core Set.[1] Since 2011,

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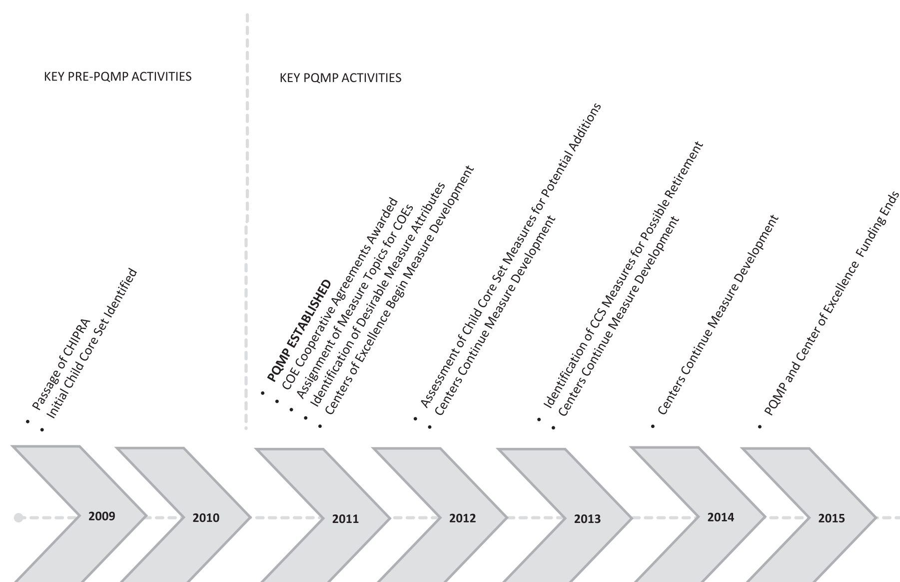

Figure. *Timeline and overview of key activities. PQMP indicates Pediatric Quality Measures Program; CHIPRA, Children's Health Insurance Program Reauthorization Act; COE, Centers of Excellence; and CCS, Child Core Set.*

the Agency for Healthcare Research and Quality (AHRQ), in partnership with Centers for Medicare & Medicaid Services (CMS) has worked to fulfill the PQMP provisions (Figure).

PQMP Goals and Related Activities

Establish a Publicly Available Portfolio of New and Enhanced Evidence-Based Pediatric Quality Measures

In February 2011, 7 PQMP Centers of Excellence (Centers) were established to develop new pediatric quality measures and methods. Six of the 7 PQMP Centers are located in academic medical centers and one in a not-for-profit organization (Table 1). In accordance with the Title IV CHIPRA provisions, each of the Centers operates as a consortium involving multiple stakeholders, including state-level Medicaid/CHIP program officials, health care providers, patient and family advocates, and clinical experts.[1]

Funding for each Center was provided through a cooperative agreement grant that allowed for greater flexibility than a contract and therefore greater recipient autonomy. However, it also permitted federal program staff to be more actively involved in advising Centers on measure development approaches, particularly with regard to providing insights on the quality measurement needs of both state and federal programs.

In meeting the PQMP goal of establishing a publicly available portfolio of pediatric quality measures, measure topics were selected, measure assessment criteria were identified, and new and enhanced measures and methods were developed.

Selection and Assignment of Measure Topics

To identify high-priority measure topics for the Centers, AHRQ and CMS started with the domains included in the CHIPRA Title IV legislation and then sought additional guidance from a panel of experts who provided recommendations for the Initial Child Core Set, the public, and the Centers themselves.[1,13] Because of the dearth of children's measures, more than 40 topics were assigned across the 7 Centers. Most topics were initially broad (eg, content of prenatal care, sickle cell treatment); therefore, the Centers worked to refine the topics into specific measure or method concepts based on evidence reviews and stakeholder input. Some concepts were identified by Centers or AHRQ as overlapping and a few measures did not hold up through the entire development process.[14] Table 1 lists the topic assignments and completed measures and methods, according to Center.

Identification of Criteria for Measure Assessment

A set of criteria (termed "desirable measure attributes") for assessing measures (Supplementary Appendix A) were identified by a panel consisting of subject matter experts, Medicaid/CHIP officials, the Centers, and AHRQ.[1] In large part, the PQMP desirable measure attributes were modeled on requirements set by leading measure development entities, including the National Quality Measures Clearinghouse, National Quality Forum, and National Committee for Quality Assurance, for assessing nominated measures. However, specific criteria corresponding to requirements outlined in the CHIPRA Title IV legislation for PQMP-developed measures were also included as desirable measure attributes: relevance to Medicaid/CHIP, attributes specifically related to children, ability of measures to assess disparities, be risk-adjusted (where appropriate), and be reportable at different levels of care (eg, state, health system, health plan, and provider).[1] Additionally, to encourage innovation, the Centers were given an opportunity to explain why a submitted measure was suitable for measuring children's health care quality, even if all criteria were not met. The desirable measure attributes were codified in the CHIPRA PQMP Candidate Measure

Submission Form which is used by the Centers to submit new measures for review.[15]

DEVELOPMENT OF PQMP MEASURES

The Centers have begun to produce a broad range of child quality health measures and methods that fill previous gaps in child health care quality measurement (Table 1). Measures have been completed for the following topics: behavioral risk assessment during prenatal care, screening and treating tobacco smoking, assessing the quality of treatment for sickle cell disease, asthma emergency department use, duration of insurance enrollment and coverage, medical complexity, neonatal care, availability of high-risk obstetric services, hospital readmissions, and measures related to antipsychotic medication use in children. Supplementary Appendix B, C, and D provide descriptions of selected completed measures focused on key PQMP measurement domains—perinatal/prenatal health, patient-reported outcomes, and management of chronic conditions. Completed measures may be considered for future updates of the Child Core Set and for other public and private uses. As work by the Centers is ongoing through 2015, updated information on the PQMP measures and methods including technical specifications can be accessed at http://www.ahrq.gov/pqmp.

IMPROVE AND STRENGTHEN THE CHILD CORE SET OF QUALITY MEASURES

In December 2009, an Initial Child Core Set of 24 children's health quality measures for voluntary use by the Medicaid/CHIP programs was released for public comment by CMS (Supplementary Appendix E).[16] The Initial Child Core Set served as an important starting point for establishing a national system for standardized reporting by States' Medicaid/CHIP programs; however, it did not address all critical gaps in child quality measurement.[17] The CHIPRA legislation required that CMS issue annual updates to the Child Core Set, beginning in January 2013 (Supplementary Appendix E). Periodic assessment and update of measures that comprise the Child Core Set allows for the identification of new measures and methods that reflect the latest evidence and approaches to health care delivery. In addition, it also allows for the integration of feedback from States regarding implementation and use of measures.[18] As detailed herein, the 2013 update focused on the addition of new measures to fill gap areas in the Initial Child Core Set whereas the 2014 update aimed to identify which, if any, of the 2013 Child Core Set measures should be considered for retirement.

IDENTIFICATION OF ADDITIONAL MEASURES

The 2013 update focused on filling gap areas in the Initial Child Core Set by identifying additional measures for possible inclusion. AHRQ, in partnership with CMS conducted a public call for nominations of measures to be considered for the Child Core Set.[19] A total of 77 reviewable measures—64 through the public call and 13 from the Centers—were submitted, covering a range of pediatric topic areas.[20] From June to October 2012, AHRQ convened an expert panel (referred to as the Subcommittee of the AHRQ National Advisory Council on Healthcare Research and Quality (SNAC)[21]—to review the submitted measures, based on the desirable measure attributes (discussed previously). The SNAC expert panel provided recommendations regarding which measures would serve to strengthen the Initial Child Core Set (ie, be suitable for Medicaid/CHIP), and which would be appropriate for programs other than Medicaid/CHIP. Of the 77 measures, the SNAC expert panel reviewed 63 that had sufficient information (eg, numerator/denominator specifications) to conduct an assessment and recommended a total of 7 measures.[20] Five of these were recommended to CMS as improvements to the Initial Child Core Set: coverage in Medicaid/CHIP, duration of a newborn's first enrollment, human papillomavirus vaccine in female adolescents, recording of computerized tomography exposure in children, and medication management and adherence for children with asthma. Two were recommended for other public or private uses: maternity care–behavioral health risk assessment, and tobacco use and help with quitting among adolescents. From the 7 recommended by the SNAC expert panel, CMS selected 3 (human papillomavirus vaccine for female adolescents, medication management and adherence for children with asthma and maternity care–behavioral health risk assessment) as additions; these were reflected in the 2013 Child Core Set.[18,22] In addition, CMS retired 1 measure (otitis media with effusion) because of challenges in collecting and reporting by states (Supplementary Appendix E).[18] Additional information on the process can be found at: http://www.ahrq.gov/policymakers/chipra/pubs/background-2012/index.html.

IDENTIFICATION OF MEASURES FOR RETIREMENT

For the 2014 update, AHRQ and CMS, in collaboration with a new SNAC expert panel reviewed a subset of CMS-selected measures from the 2013 Child Core Set to identify which, if any, should be considered for retirement.[23] Six of the 2013 Child Core Set measures were not included in this review because they were recently added or they were required by a legislative mandate. The remaining 20 measures were assessed based on importance (including evidence for the focus of the measure), scientific acceptability of the measures (measure reliability and validity), feasibility, and usability (including evidence on the effectiveness of quality improvement strategies related to the measure topics). The SNAC expert panel recommended 3 measures for retirement: appropriate testing for children with pharyngitis (2–18 years), annual pediatric hemoglobin A1C testing (5–17 years), and child and adolescent access to primary care practitioners. Of the 3 measures recommended by the SNAC expert panel, CMS selected 2 for retirement (pharyngitis testing and hemoglobin A1C testing) and also recommended retiring annual percentage of asthma patients who are 2–20 years old with 1 or more asthma-related Emergency Department visits.[24] The asthma measure was retired because the measure had lost formal stewardship. These changes are reflected in the 2014 Child Core Set Update

Table 1. CHIPRA PQMP Pediatric Quality Measure Topics and Completed Measures and Methods, According to COE

	Prevention and Health Promotion Quality Measures		Treatment and Management Quality Measures†		
AHRQ-CMS PQMP COE* and *Institutional Affiliation*	Perinatal/Prenatal	Child Clinical Preventive Services	Management of Acute Conditions	Management of Chronic Conditions	Other
CAPQUAM: Collaboration for Advancing Pediatric Quality Measures *Icahn School of Medicine at Mount Sinai*	• **Availability of HROB care**		• **Timely temperature for LBW newborns** • **Temperature on admission of LBW neonate to Level ≥2 nurseries** • Medication reconciliation • Follow-up after mental hospitalization	• **Asthma-related ED use**	
CEPQM: Children's Hospital Boston COE for Pediatric Quality Measurement *Children's Hospital Boston*			• **Pediatric (nonneonatal) hospital readmissions (all causes, lower respiratory infection)** • Global pediatric inpatient safety tool	• Identification of children with disabilities • Transition from child- to adult-focused care	• **Child HCAHCPS** (Web version to come)
CHOP: COE at the Children's Hospital of Philadelphia (CHOP)/University of Pennsylvania *Children's Hospital of Philadelphia*			• Neonatal readmissions • Neonatal cost-quality interaction‡ • Oral health PRO • Avoidance of antimicrobial use for otitis media		• **Duration of enrollment and coverage measures**§ • **Risk adjustment** • **Pediatric global health measure (PRO)**‖ • Cost-to-quality¶
COE4CCN: COE on Quality of Care Measures for Children with Complex Needs *Seattle Children's Research Institute*				• **Pediatric medical complexity algorithm** • Care coordination • Mental health ED and hospital • Quality of transitions (eg, inpatient setting to home; within hospital)	
NCINQ: National Collaborative for Innovation in Quality Measurement *National Committee for Quality Assurance*		• **Sexual activity status documentation**# • **Tobacco use identification and help with quitting**#		• **Antipsychotic use measures** (depression management and follow-up) • Alcohol/drug screening of depressed adolescents	• Foster care measures

PMCoE: Pediatric Measurement COE *Children's Hospital and Health System of Wisconsin*	• **Prenatal behavioral health risk assessment**** • Other perinatal measures‖: - Spontaneous labor and birth - Elective delivery before 39 weeks - Prenatal care screening	• Follow-up to developmental screening	• PICU quality • Dental treatment • Continuum of care measures	• **ADHD follow-up: accurate ADHD diagnosis in preschoolers; behavioral therapy as first-line treatment** • ADHD follow-up and symptom management process measure • ADHD follow-up and symptom management outcome measure‖
Q-METRIC: Quality Measurement, Evaluation, Testing, Review, and Implementation Consortium *University of Michigan, Ann Arbor*		• Follow-up to child BMI assessment	• Sepsis • Imaging for headaches and seizures • Respiratory bundle	• **Sickle cell disease treatment measures** • Availability of non-HROB specialty services (physical health specialty services; mental health specialty services; dental services)

CHIPRA indicates Children's Health Insurance Program Reauthorization Act; PQMP, Pediatric Quality Measures Program; COE, Center of Excellence; HROB, high-risk obstetric; LBW, low birth weight; ED, Emergency Department; HCAHCPS, Hospital Consumer Assessment of Health Care Providers and Systems; PRO, patient-reported outcome measure; SNAC, Subcommittee of the Agency for Healthcare Research and Quality National Advisory Council; PICU, Pediatric Intensive Care Unit; ADHD, attention-deficit hyperactivity disorder; and BMI, body mass index.

Assigned measure topics are in normal text and completed measures are in bold text.

*Current as of June 20, 2014.

†Some measures might apply to children with chronic conditions, acute conditions, or both.

‡Concept/method; not a measure.

§Two of the 3 measures were recommended by the 2012 SNAC for the Child Core Set, but not adopted.

‖For a literature review, see the article by Woods et al,[11] in this issue.

¶For preliminary work, see the article by Silber and Forrest,[12] in this issue.

#Recommended by the 2012 SNAC for uses other than the Child Core Set.

**Added to the Child Core Set in January 2013.

Table 2. Core Set of Child Health Care Quality Measures for Medicaid and CHIP in 2014

Abbreviation	NQF No.	Measure Steward	Measure Name
ADD	0108	NCQA	Follow-Up Care for Children Prescribed Attention Deficit Hyperactivity Disorder (ADHD) Medication
AMB	NA	NCQA	Ambulatory Care–Emergency Department (ED) Visits
AWC	NA	NCQA	Adolescent Well-Care Visit
BHRA	NA	AMA-PCPI	Behavioral Health Risk Assessment (for Pregnant Women)
CAP	NA	NCQA	Child and Adolescents' Access to Primary Care Practitioners
CHL	0033	NCQA	Chlamydia Screening in Women
CIS	0038	NCQA	Childhood Immunization Status
CLABSI	0139	CDC	Pediatric Central Line–Associated Bloodstream Infections—Neonatal Intensive Care Unit and Pediatric Intensive Care Unit
CPC	NA	NCQA	Consumer Assessment of Healthcare Providers and Systems CAHPS 5.0H (Child Version Including Medicaid and Children with Chronic Conditions Supplemental Items)
PC02	0471	TJC	Cesarean Section for Nulliparous Singleton Vertex
DEV	1448	OHSU	Developmental Screening in the First Three Years of Life
FPC	1391	NCQA	Frequency of Ongoing Prenatal Care
FUH	0576	NCQA	Follow-up After Hospitalization for Mental Illness
HPV	1959	NCQA	Human Papillomavirus (HPV) Vaccine for Female Adolescents
IMA	1407	NCQA	Immunization Status for Adolescents
LBW	1382	CDC	Live Births Weighing Less than 2,500 Grams
MMA	1799	NCQA	Medication Management for People with Asthma
PDENT	NA	CMS	Percentage of Eligibles That Received Preventive Dental Services
PPC	1517	NCQA	Timeliness of Prenatal Care
TDENT	NA	CMS	Percentage of Eligibles That Received Dental Treatment Services
WCC	0024	NCQA	Weight Assessment and Counseling for Nutrition and Physical Activity for Children/ Adolescents: Body Mass Index Assessment for Children/Adolescents
W15	1392	NCQA	Well-Child Visits in the First 15 Months of Life
W34	1516	NCQA	Well-Child Visits in the 3rd, 4th, 5th, and 6th Years of Life

NQF indicates National Quality Forum; CHIP, Children's Health Insurance Program; NCQA, National Committee for Quality Assurance; AMA-PCPI, American Medical Association-Physician Consortium for Performance Improvement; CDC, Centers for Disease Control and Prevention; TJC, The Joint Commission; OHSU, Oregon Health and Science University; CMS, Centers for Medicare & Medicaid Services; and NA, measure is not NQF-endorsed.

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(Table 2 and Supplementary Appendix E).[24] Dougherty et al,[22] in this issue, provide additional information on the process for identifying measures for retirement.

KEY CHALLENGES AND LESSONS LEARNED TO DATE

The allocation of significant resources for the PQMP provides an unprecedented opportunity to invest in the science of measure development and to address gaps in children's quality measurement. However, a number of challenges emerged during the development of new measures and methods, including difficulty with testing using existing data infrastructures and balancing stakeholder priorities; these challenges are detailed elsewhere in this issue.[14] Here we focus on 3 key cross-cutting lessons related to the CHIPRA stipulation that measures be evidence-based, tension between measure importance and feasibility, and the need for addressing measure dissemination and stewardship.

The generation of evidence-based pediatric measures continues to be stymied by the paucity of relevant evidence in the biomedical literature. The absence of evidence on clinical preventive services for children provides just one glaring example of scarcity.[25] Thus, the PQMP goal of producing evidence-based measures is grounded in the reality that there might not be demonstrated linkages between structures and processes of care and child health outcomes. Absent these relationships, the validity and value of the measures could be questioned. After undertaking evidence reviews as a first step in measure development, Centers often had to face the reality of a paucity of relevant and rigorous studies.[14,26] This lack of evidence prompted some Centers to halt the production of measures on important topics, such as the provision of mental health care and the content of child and adolescent well care. Growing federal investments in comparative effectiveness research and patient-centered outcomes research should help to strengthen the evidence base.[27–29] However, ensuring that these investments and other resources are applied to high-priority topics for children and youth in Medicaid/CHIP will be essential for advancing pediatric quality measurement.

Another practical challenge is the tension that results from balancing measure importance and feasibility. During the 2012 and 2013 update process, the SNAC expert panels charged with recommending measures for voluntary use by Medicaid/CHIP programs were torn between selecting important but difficult to collect measures and measures that were more feasible for states.[20,23] States and other public and private health care entities face limited resources and competing measurement priorities.[30] Thus, data collection and reporting burdens remain a paramount concern. SNAC expert panel members highlighted the need

for measures on key topics for which there are measurement gaps but also emphasized the importance of considering feasibility. Trade-offs related to importance and ease and expense of data collection were debated. The Centers are developing numerous measures on assigned topics reflecting needs and gaps identified by AHRQ, CMS, and public comment (Table 1). A number of the new measures are collected through medical records and surveys and do not rely on administrative data, which is relatively easy to collect. Recognizing the practical challenges, only a limited number of new measures might initially be incorporated into the Child Core Set annually. However, improvements in states' analytic and reporting functions and the increased use of electronic health records might help redefine what is "feasible" over time and facilitate use of new, more clinically relevant quality measures.[31]

Additionally, as important gains continue to be made by the PQMP with regard to the development of new measures, focus needs to shift to greater dissemination, adoption, and use of measures. One PQMP measure was added to the 2013 Child Core Set for voluntary reporting by Medicaid/CHIP programs and several of the more recently developed measures and methods are being used by hospitals, such as the Child Hospital Consumer Assessment of Health Care Providers and Systems and the Pediatric Medical Complexity Algorithm, suggesting a broad audience for newly created quality measures. Ultimately, it is the widespread use and reporting on these measures that will be critical to meeting CHIPRA's vision of high-quality care for children. Reporting on the new measures might allow for broader comparative analysis and quality improvement efforts across an array of important topic areas. All measures and methods developed by the PQMP, including technical specifications, will be publicly available on the AHRQ Web site for dissemination and use. However, the time-limited grant mechanism used to fund the PQMP Centers ends in 2015; therefore, future measure stewardship remains an important consideration because measures require periodic updating with regard to technical specifications and also review of evidence underlying measures.

CONCLUSION

It is often said that children are the future and critical for the nation's continued economic health.[32] Children are also the present, comprising 25% of the US population, an estimated 74 million, at the beginning of 2014.[33] More than a third of the nation's children receive health care through Medicaid/CHIP.[10] The life-course perspective, increasingly adopted by policymakers and researchers, highlights how quality of care deficits early in life can have long-lasting and serious consequences for children when they become adults.[34]

The PQMP has provided a foundation for advancing measurement activities aimed at maximizing quality of care and health outcomes for children. Sustained investment and focus on strengthening measurement and improvement activities along with supporting states' data collection and reporting infrastructure will play a role in achieving a high-quality health care system for all children. Health care quality programs simply cannot improve without reliable, valid, and practical quality measurement. Greater realization of CHIPRA's vision is contingent on the continual evaluation and refinement of children's health care quality measures. However, it is the adoption and use of evidence-based measures that will ultimately drive improvements in child health.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.acap.2014.06.025

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