



# A New Era in Quality Measurement: The Development and Application of Quality Measures

Terry Adirim, MD, MPH, FAAP, Kelley Meade, MD, FAAP, Kamila Mistry, PhD, MPH, COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY, COMMITTEE ON PRACTICE AND AMBULATORY MANAGEMENT

Quality measures are used for a variety of purposes in health care, including clinical care improvement, regulation, accreditation, public reporting, surveillance, and maintenance of certification. Most quality measures are 1 of 3 types: structure, process, or outcome. Health care quality measures should address the domains of quality across the continuum of care and reflect patient and family experience. Measure development for pediatric health care has a number of important challenges, including gaps in the evidence base; the fact that measures for most conditions must be age-specific; the long, resource-intensive development process; and the national focus on measure development for adult conditions. Numerous national organizations focus on the development and application of quality measures, including the Pediatric Quality Measures Program, which is focused solely on the development and implementation of pediatric-specific measures. Once a quality measure is developed for use in national measurement programs, the organization that develops and/or “stewards” the measure may submit the measure or set of measures for endorsement, which is recognition of the scientific soundness, usability, and relevance of the measure. Quality measures must then be disseminated and applied to improve care. Although pediatric health care providers and child health care institutions alike must continually balance time and resources needed to address multiple reporting requirements, quality measurement is an important tool for advancing high-quality and safe health care for children. This policy statement provides an overview of quality measurement and describes the opportunities for pediatric health care providers to apply quality measures to improve clinical quality and performance in the delivery of pediatric health care services.

## abstract

FREE

*This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.*

*Policy statements from the American Academy of Pediatrics benefit from expertise and resources of liaisons and internal (AAP) and external reviewers. However, policy statements from the American Academy of Pediatrics may not reflect the views of the liaisons or the organizations or government agencies that they represent.*

*The guidance in this statement does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.*

*All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.*

**DOI:** 10.1542/peds.2016-3442

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2017 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The authors have indicated they do not have a financial relationship relevant to this article to disclose.

**FUNDING:** No external funding.

**POTENTIAL CONFLICT OF INTEREST:** The authors have indicated they have no potential conflicts of interest to disclose.

**To cite:** Adirim T, Meade K, Mistry K, AAP COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY. A New Era in Quality Measurement: The Development and Application of Quality Measures. *Pediatrics*. 2017;139(1):e20163442

## INTRODUCTION

The American Academy of Pediatrics (AAP) and its members are committed to the highest-quality and safest health care for infants, children, adolescents, and young adults. Quality measurement is a critical tool for improving health care quality and patient safety. Quality measures are used for a variety of purposes, including improvements in clinical care, regulation, accreditation, public reporting, surveillance, and maintenance of certification (MOC) programs. In addition, the federal government and other payers are shifting to payment programs linked to quality, such as accountable care organizations (ACOs) and patient-centered medical homes, making it increasingly important that pediatric health care providers understand and implement quality measurement into clinical care processes.

The emerging focus on value in health care to address rising costs and to ensure desirable patient outcomes has led to a rapid increase in the development of quality measures.<sup>1</sup> Although the development of pediatric-specific quality measures has intensified, it has not kept pace with the number and breadth of quality measures applicable to adults. Much of the focus and resources allocated to the development of quality measures have been, and continue to be, targeted toward the adult population, which accounts for most of the nation's health care spending. The result has been relatively small investments in child health quality measure development. Although some measures may be applicable to both children and adults, it is important that all involved in the implementation of quality measures, such as national policy makers, health care organizations, payers, physician organizations, and pediatric health care providers, understand that measures that are appropriate for adults may

not be suitable for children. It is useful to think about the unique considerations for children compared with adults as the 5 Ds: developmental change, dependency, differential epidemiology, demography, and dollars (differences in financing of child health services).<sup>2,3</sup> These differences are important when developing, choosing, and implementing quality measures. Another consideration for increasing the investment in child health measures is that many adult conditions begin during childhood, and therefore, early identification and intervention can lead to improvements in child health care quality and potentially can have significant positive effects on lifelong health combined with reductions in long-term health care costs. This policy statement provides an overview of quality measurement and describes opportunities for pediatric health care providers to apply quality measures to improve clinical quality and performance in the delivery of pediatric health care services.

## TYPES OF QUALITY MEASURES

To understand how measures are applied to children, it is useful to understand the types of quality measures. Quality measures are "tools that help us measure or quantify health care processes, outcomes, patient perceptions, and organizational structure and/or systems that are associated with the ability to provide high-quality health care."<sup>4,5</sup> The Institute of Medicine specified 6 key domains or targets for improving health care quality: safety, timeliness, effectiveness, efficiency, equity, and patient/family centeredness.<sup>4</sup> In addition, the components of the "Triple Aim" (<http://www.ihp.org/engage/initiatives/tripleaim/Pages/default.aspx>), improving patient experience, improving the health of populations,

and reducing the per capita cost of health care, should be incorporated in measurement frameworks. Health care quality measures should address the domains of quality across the continuum of care and reflect patient and family experiences. Measures can be specific to conditions (eg, treatment of asthma in children) or cut across conditions, such as measures focused on coordination of care or hospital readmission. Preventive care, management of acute conditions, and increasingly, long-term and end-of-life issues as well as the transition from 1 site of care or 1 provider to another also should be included in pediatric quality-measurement frameworks.

Although many quality measures are available, most are categorized into 1 of 3 measure types: structure, process, or outcomes.<sup>6</sup> Structural measures assess "sufficiency of resources and proper system design," including organizational characteristics, such as the type of care provided (eg, primary or specialty) and the use of specific systems for improving care (eg, an electronic health record or registry).<sup>7</sup> Process measures assess the interaction between the patient (and/or his or her family) and the practitioner.<sup>6</sup> Specifically, process measures assess the way in which care and services are provided, including assessment, evaluation, diagnosis, and treatment (eg, prescribing an asthma-control medication for a child with chronic asthma, provision of private confidential one-on-one screening and counseling to adolescents). Process includes the extent to which the patient is able to access needed health care services and the practitioner's use of standardized assessments. Outcome measures assess the effect of care delivered on the patient's (and family's) health and function. Outcome measures may reflect immediate outcomes, such as the proportion of immunized

patients; intermediate outcomes, such as the number of visits to the emergency department for asthma attacks; or long-term outcomes, such as permanent disability or death. Another outcome measure includes patient-reported outcomes, which increasingly are recognized as an important component of a quality-measurement program. Patient-reported outcome measures include any report of the status of a patient's health condition that comes directly from the patient (or family) without interpretation of the patient's response by a practitioner or anyone else.<sup>8,9</sup> The inclusion of the patient and family perspective regarding the delivery of health care is important in framing the pediatric approach to quality.

Quality measures do not have a hierarchy. Although an outcome measure may be ideal in some circumstances, process and structural measures also are important in assessing a patient's care, especially when the process or structure is proven to be critical to the patient's outcome. With regard to children, in many cases, outcome measures may not be useful, because adverse outcomes are rare and therefore are applicable to a narrow population of children with serious chronic disease. For that reason, process measures that are more closely linked to improving outcomes on the basis of available evidence, such as those assessing preventive care and counseling, may be more relevant to children and youth and may be easier and less costly to use.

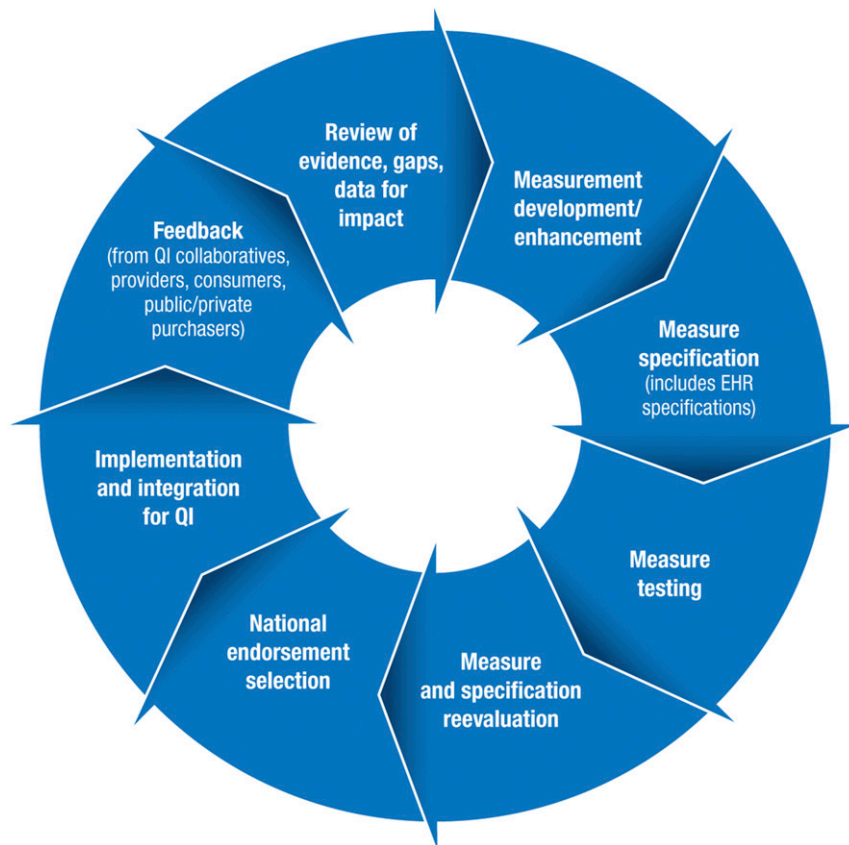
## **DEVELOPMENT AND ENDORSEMENT OF QUALITY MEASURES**

The quality-measure development process involves a number of key steps, which can take months or even years to complete. Alternatively, the process could begin with an already established evidence-based guideline. Otherwise, the process

generally begins with an evidence review to identify and prioritize measure topics. The next steps include an environmental scan of the literature to determine whether measures exist, development of draft measure specifications, testing of draft measures, endorsement of measures, implementation, and continual feedback from stakeholders (Fig 1).<sup>10,11</sup> The development process is designed to assess a measure's importance, scientific soundness, feasibility, and usability. Moreover, as part of the development process, stakeholder input is critical in determining measures concepts and in prioritizing them. Stakeholders should include patients or family members, health care practitioners, and payers to ensure that all views are gathered from groups affected by quality measures. Once the measure topic area is determined to be important, developers begin the process of measure specification and testing. The components of measure specification include denominator, numerator, exclusions, data sources, and technical specifications to ensure proper implementation. Testing of the measure takes place to determine its validity and reliability, which entail determining whether the measure is scientifically sound and feasible to use. In addition, it is critical that data sources are available to extract the data used in the measure.<sup>11</sup> Data sources include administrative data (eg, health insurance claims data), disease registries, health records (paper or electronic), and qualitative data (eg, some types of patient surveys). Some data sources are easier to obtain and use than others; therefore, when developing measures, the accessibility of data for that measure or set of measures is an important consideration. Finally, stewardship of measures is an important component in the measurement process. Measure stewards maintain and refine measures to ensure that technical specifications remain

up to date. Measure stewards may or may not also be measure developers. There are various models delineating the quality-measures development process that are similar. The American Medical Association Physician Consortium for Performance Improvement model (Fig 1) shows that the development process is a cycle. The cycle often starts with a review of the evidence and gaps, proceeds to measure development/enhancement and specification, and then moves to testing; and depending on the intended use of the measure, the measure may be endorsed by a national organization. After implementation, feedback and evaluation are important to determine the usefulness and validity of the measure.

Numerous national organizations focus on the development of pediatric quality measures. The federal government is a significant funder of health care quality-measure development. A variety of public-private organizations and academic institutions also develop pediatric quality measures. Organizations that develop a significant number of measures include the American Medical Association's Physician Consortium for Performance Improvement, the National Committee for Quality Assurance (NCQA), the Accreditation Association for Ambulatory Health Care, and the Utilization Review Accreditation Commission (URAC). The NCQA develops the measures that >90% of private insurers use.<sup>12</sup> The NCQA, a membership organization that includes most health plans, develops measures and certifies health plans on the basis of their performance by using its Healthcare Effectiveness Data and Information Set (HEDIS). HEDIS measure sets include measures applicable to children as well as child-specific quality and performance measures.<sup>12</sup> The only



**FIGURE 1**

Quality measure development process. (Reprinted with permission from American Medical Association. Physician Consortium for Performance Improvement. Measure development process. Available at: <http://www.ama-assn.org/ama/pub/physician-resources/physician-consortium-performance-improvement/pcpi-measures/about-measure-development/process.page>.<sup>10</sup> Copyright © 1995–2015 American Medical Association.) EHR, electronic health record; PCPI, Physician Consortium for Performance Improvement; QI, quality improvement.

national program focused solely on pediatric-specific measure development and implementation is the Pediatric Quality Measures Program (PQMP).

Title IV of the Children’s Health Insurance Program Reauthorization Act (CHIPRA) of 2009 focused on a number of provisions to improve quality of care for children in Medicaid, including establishing the PQMP to (1) develop a portfolio of publicly available, new, and enhanced evidence-based pediatric quality measures for use by Medicaid/Children’s Health Insurance Program (CHIP) and other public and private programs and (2) provide opportunities to improve and strengthen the Child Core Set (CCS).

Since 2011, the Agency for Healthcare Research and Quality, in partnership with the Centers for Medicare and Medicaid Services (CMS), has worked to fulfill the PQMP provisions.<sup>13</sup> Seven PQMP Centers of Excellence (COEs) were funded (through 2016) to develop a broad range of measures and methodologies that fill previous gaps in child health care quality measurement. The primary domains for measure development included perinatal/prenatal health, preventive services, patient-reported outcomes, and the management of chronic and acute conditions. Completed measures may be considered for future updates to the CCS of quality measures reported on by state Medicaid/CHIP or for other public-private uses.

Once a measure is developed for use in national measurement programs, the organization that develops or “stewards” the measure may submit the measure or set of measures for endorsement. The National Quality Forum (NQF), a nonpartisan public-private organization, serves as the primary measure-endorsement body nationally. The NQF convenes the Measure Applications Partnership, which provides input to the US Department of Health and Human Services (DHHS) on the selection of quality measures for public reporting, evaluating performance, and supporting value-based programs.<sup>14</sup> The NQF endorsement process includes broad participation from various health care stakeholders, including health care professionals, consumers, public and private purchasers, employers, hospitals, health plans, and other organizations involved in health care research or quality improvement, including the AAP. The NQF evaluates proposed measures to ensure that they are “evidence-based, important to making significant gains in health care quality, and improving health outcomes for a specific high-priority (high-impact) aspect of health care where there is variation in or overall less-than-optimal performance.”<sup>15</sup> Many CMS reporting programs prioritize the use of NQF-endorsed measures; however, many other rigorously developed measures are available and appropriate for use by health care practices and institutional quality-improvement programs.

## **MULTIPLE USES FOR QUALITY MEASURES**

### **Quality Measures for Clinical Improvement**

A variety of quality measures are used at the practice or institutional level to improve and monitor quality of the health care services delivered. Domains most frequently measured in health care settings include



process of care (timely and efficient), outcomes (effective), safety, and patient experience (patient centered and equitable).<sup>16,17</sup> Measures should be selected to reflect the attributes and goals of the practice or institution, and their outcomes should be compared with national and regional benchmarks to help determine improvement activities. Pediatric health care providers also can identify areas for improvement within their practices by using tools such as the Plan-Do-Study-Act cycle.<sup>18,19</sup> Measurement is used to determine whether the practice change has resulted in improvement. Pediatric health care providers planning on integrating quality improvement into their practices can learn how to do so by accessing resources shown in Table 1.

Pediatric practices and health care systems may create registries of patients by disease or condition with the use of their electronic health records system to monitor care and patient outcomes, which requires the implementation of measures to track progress. For example, an institution may want to set goals around the care of high-risk patients, such as children and youth with chronic persistent asthma, to determine how many are being prescribed controller medications and what percentage have had to visit the emergency department for an acute exacerbation. Alternatively, in smaller practices, pediatric health care providers may want to monitor immunization rates to help their practices meet national goals. In other health care settings, such as emergency departments, a goal may be to administer antibiotics for immune-compromised patients presenting with specific symptoms within 60 minutes of arrival. Registries can vary in sophistication from simple spreadsheets for smaller practices to large electronic databases across multiple practices or institutions. In setting up

**TABLE 1** Resources for the Pediatric Practitioner

Learn More About	Resources
Quality-improvement methods for practice	AAP Quality Improvement Toolbox Institute for Healthcare Improvement Plan-Do-Study-Act Worksheet AAP Education in Quality Improvement in Pediatric Practice AAP National Center for Medical Home Implementation
Quality measures inventories	National Institute for Child Health Quality AHRQ National Quality Measures Clearinghouse DHHS Quality Measures Inventory American Medical Association Physician Consortium for Performance Improvement NCQA HEDIS Measures
Pediatric Quality Measures Program	AHRQ Pediatric Quality Measures Program Academic Pediatrics Journal Supplement on Quality Improvement
Quality-improvement collaborative networks	AAP Quality Improvement Innovation Networks
National endorsement process	National Quality Forum

AHRQ, Agency for Healthcare Research and Quality.

registries, practices should use clear and accurate definitions to ensure that the data used reflect the true incidence of the measure selected. The pediatric practitioner should also be aware of the challenges of implementing quality measures across practices and in larger institutions or networks. Although most practices use electronic health records, some still collect data by hand. Moreover, because at this time electronic health records may not be interoperable across practices and within and across institutions, aggregating data can be challenging.

Because quality improvement is a core competency of the Accreditation Council on Graduate Medical Education for pediatricians in training, institutions with residency programs usually have active quality-improvement projects. Training programs are required to “ensure that residents are integrated and actively participate in interdisciplinary clinical quality improvement and patient safety programs.”<sup>20</sup> Moreover, practicing pediatricians are required to participate in quality improvement in practice activities through the American Board of Pediatrics’ MOC part 4 or “Performance in Practice.” Many of these quality-improvement activities require measures to assess

and track progress. (See Table 1 for a list of resources.)

Some pediatric quality-improvement networks provide infrastructures for establishing connections between practices for sharing data and tools. Examples include the AAP Quality Improvement Innovation Networks and the AAP Practice Improvement Network. In all settings and circumstances, quality measures are instrumental in assessing improvements in the quality and safety of health care delivery. Quality measures used locally for clinical quality improvement do not have to be NQF endorsed but should be scientifically valid and reliable. (See Table 1 for a list of easily accessible inventories of validated pediatric measures for local quality-improvement activities.)

In addition, as many small and solo groups merge into clinically integrated networks, it is increasingly important that these practices show that they are providing value to payers by measuring clinical outcomes. A foundation of quality measures and quality improvement supports the development of large, clinically integrated networks, and the recent advent of value-based care by both private and public payers will accelerate the need for appropriate pediatric measures.

## Quality Measures for Regulation and Accreditation

Practitioners and health care institutions collect and report measures for health care provider incentive programs (for regulatory purposes) and accreditation/certification programs. The largest entity requiring reporting of measures for incentive programs is the CMS, located within the DHHS. The CMS develops and uses measures for its quality-improvement, public-reporting, and pay-for-performance programs. In 2014, 33 federal programs (mostly related to Medicare) required health care practitioners to submit data on 1675 quality measures, with state, local, and private health plans using hundreds more.<sup>21</sup> The only program relevant to pediatric health care providers and pediatric subspecialists is the Medicaid Electronic Health Record Incentive Program. As a federally administered program, the CMS requires Medicare providers in all states to report on uniform quality measures. As state-administered programs, Medicaid and CHIP quality reporting varies.

In April 2016, the CMS issued the Medicaid and CHIP Managed Care Final Rule, the first major update to the managed-care regulations in more than a decade. The final rule “aligns key rules with those of other health insurance coverage programs, modernizes how states purchase managed care for beneficiaries, and strengthens the consumer experience and key consumer protections.”<sup>22,23</sup> More specifically, the final rule includes a number of major state requirements regarding quality-measurement and performance-improvement programs, including the development and implementation of a quality rating strategy by May 2019.

Organizations that use quality measures for accreditation and certification purposes include the NCQA, the URAC, and The Joint

Commission, among others. The NCQA manages several accreditation, certification, and physician-recognition programs, such as ACOs and patient-centered medical homes.<sup>24</sup> HEDIS measures are used in the CMS Quality Rating System to help consumers and families compare qualified health plans (health plans offered in the Affordable Care Act Health Insurance Marketplaces), and they are used in a report card of the NCQA-accredited health plans for consumers to compare plans as well as in other reports and rankings of health plans.<sup>25</sup> The NCQA also maintains the Consumer Assessment of Healthcare Providers and Systems patient-centered medical homes core set of measures, an important set of measures used mostly by hospitals and for which public reporting has major marketing importance. The URAC is an independent, nonprofit organization that promotes health care quality through accreditation of health plans, case-management programs, provider care and integration programs, and pharmacy quality-management programs.<sup>26</sup> The Joint Commission is an independent, nonprofit organization that accredits and certifies >20 500 health care organizations and programs in the United States and internationally. The Joint Commission maintains core measure sets for hospitals.<sup>27</sup>

## Quality Measures for Reporting and Surveillance

Quality measures are used for reporting to public agencies and nongovernmental organizations and for public reporting. Pediatric health care providers who participate in the Medicaid Electronic Health Record Incentive Program report measures to the CMS for attestation of meaningful use. The NCQA, discussed previously, and other membership groups and organizations also publicly report on health plans, practitioners, and other health care institutions. For NCQA certification of patient-centered medical homes,

practitioners are required to report quality measures.<sup>24</sup> The Leapfrog Group, a membership organization of employers and other health plan purchasers, manages a voluntary program to recognize hospitals and health care providers that have made progress in health care safety, quality, and customer value, which are assessed with NQF-endorsed quality measures.<sup>28</sup>

In addition, recognizing the need “to estimate the overall quality of health care for children,” CHIPRA included specific provisions requiring the Secretary of the DHHS to report annually to Congress on the following: (1) the status of the efforts of the DHHS to improve the quality of health care furnished to children under Titles XIX (Medicaid) and XXI (CHIP), (2) the status of voluntary reporting by states by using the initial core quality measure set, and (3) any recommendations for legislative changes needed to improve the quality of care provided to children under Medicaid and CHIP.<sup>29,30</sup> The Core Set of Children’s Health Care Quality Measures (CCS) serves as an important starting point for establishing a national system for standardized reporting by states. The CCS is updated annually to allow for the identification of new measures and methods that reflect the latest evidence and approaches to health care delivery. Information on the CCS can be found at <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/CHIPRA-Initial-Core-Set-of-Childrens-Health-Care-Quality-Measures.html>, and information on the Secretary’s annual report to Congress on child health quality can be found at <https://www.medicaid.gov/medicaid-chip-program-information/by-topics/quality-of-care/downloads/2015-child-sec-rept.pdf>.

In an effort to continually inform the selection of measures for the CCS and to strengthen the knowledge

base underlying reporting and quality-improvement efforts for children in Medicaid/CHIP, the PQMP launched a new effort in October 2016. This new phase of the PQMP, through the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), funds 6 grantees to build on the work previously completed by the PQMP COEs in developing pediatric measures but shifts the focus to assessing the feasibility and usability of the newly developed measures at multiple levels of service delivery. Overall, this effort aims to build evidence to support performance monitoring and quality improvement for children in Medicaid/CHIP by increasing the number of new measures being implemented and reported at multiple levels (state, health plan, and provider) in key gap areas, informing efforts to streamline data collection and reporting processes, and supporting states to drive improvement in health care quality by using the CCS and the PQMP-COE measures.<sup>31</sup>

### Quality Measures for Payment

The Affordable Care Act (ACA) provided access to health insurance for millions of Americans. In fact, Medicaid, CHIP, or private insurance now covers almost 95% of children. The ACA has also facilitated the implementation of new payment models intended to improve the quality of care while reducing costs for families. In January 2015, the Secretary of the DHHS announced that it “intends to focus its energies on... using incentives to motivate higher value care, by increasingly tying payment to value through alternative payment models....”<sup>32</sup> Furthermore, the DHHS announced new goals for its payment programs, including that 85% of all Medicare fee-for-service payments will be tied to quality or value by 2016, and this number will increase to 90% by 2018. Although these goals are

specific to the Medicare program, The DHHS also is encouraging state Medicaid programs and private payers to make progress toward increasing the use of value-based payments. Section 2713 of the Affordable Care Act allows the Secretary of the DHHS to establish guidelines to permit health insurance plans to use value-based insurance designs.<sup>33</sup>

Defining and measuring value are challenging. Value is related to the cost and quality of care, which include patient outcomes and patient satisfaction. Value-based payment models aim to increase health care quality while decreasing costs. These programs accomplish this by tying payment incentives (or disincentives) to goals and measurement. The CMS defines value-based payment as holding “health care providers accountable for both the cost and quality of care they provide. It attempts to reduce inappropriate care and to identify and reward the best-performing providers.”<sup>34</sup> Porter<sup>35</sup> defines value in health care as “the patient health outcomes achieved per dollar spent,” and furthermore, “value should define the framework for performance improvement in health care. Rigorous, disciplined measurement and improvement of value is the best way to drive system progress.” In the context of child health, Forrest and Silber<sup>36</sup> described dimensions of value that include outcomes, patient (or family)-reported outcomes, financial cost to family, and financial cost to society. These dimensions can be assessed at the individual level or the systems level. Value-based measures are a nascent concept, and frameworks have been proposed for the development of pediatric value measures.

Alternatives to the current fee-for-service model of payment being promoted and implemented by the DHHS and private payers include ACOs, episodes-of-care

payments, and global payments to health care providers. ACOs are networks of providers with unified governance that assume risk for the cost and quality of the care they deliver.<sup>37</sup> ACOs are designed to reduce medical costs by monitoring care across multiple care settings, including physician practices, clinics, emergency departments, and hospitals, and they hold providers accountable for the quality and overall cost of the care provided.<sup>38</sup> Providers are given spending targets, and if costs to care for patients are less than the target, the providers share in the savings. ACOs theoretically incentivize providers to choose the most effective and efficient care for patients. In fact, cost savings must be achieved while maintaining or improving quality, so setting limits on utilization alone would not be acceptable. Episode-of-care payments or bundled payments are single payments for a group of services related to a treatment or condition that may involve multiple providers in multiple settings as opposed to fee for service with reimbursement for each service during the course of treatment.<sup>39</sup> Furthermore, additional payments are not made for complications that may occur during treatment. Providers share any savings if the cost of the care is below a target amount. Bundled payments incentivize practitioners to reduce unnecessary tests and visits and to improve processes with the aim of reducing complications related to care.<sup>40,41</sup> The challenge with this payment design for pediatric patients is that, unlike acute illnesses and conditions, many chronic pediatric conditions do not have discrete dates of onset and no resolution. Global payments are fixed prepayments made to providers or a health care institution or system that cover most or all of a patient’s care during a specified time period. Instead of each provider receiving payments, they are paid as a group,

which theoretically creates more cooperation, coordination, and accountability among providers.<sup>42</sup> Global payments are similar to episode-of-care payments, but the difference is that global payments are made for a group of patients, such as enrollees in a health plan, and cover all care that is covered by the health plan.

The CMS has developed a framework for progression of payment reform for practitioners and health care organizations from traditional fee for service, to fee for service with a link to quality and other alternate payment models, including accountable care, medical homes, and global payments.<sup>43</sup> All of the models except for the fee-for-service model require quality measurement and reporting. Moreover, private insurers and state Medicaid programs are implementing these newer models, and therefore, pediatric health care providers should understand the role of quality measurement within these payment schemes to navigate successfully through these payment programs.

#### **LIMITATIONS AND CHALLENGES RELATED TO THE DEVELOPMENT AND IMPLEMENTATION OF QUALITY MEASURES**

Developing pediatric-specific and pediatric-relevant quality measures involves a number of challenges. There is a relative paucity of evidence in the pediatric scientific literature supporting the best diagnostic approach and management of pediatric conditions. In addition, quality-measure development is an expensive and time-consuming process, and without a sustained funding source to support development, implementation, and stewardship, the pipeline of pediatric quality measures likely will be considerably reduced. The MACRA only extends CHIP and PQMP funding through September 2017.

Another challenge for pediatric quality measurement is the reporting and implementation of existing measures across a wide variety of unique settings. Because state Medicaid programs are not required to report on the pediatric core set of measures, there is wide variation in reporting among the states, such that a comparison of child health indicators on a national level is not possible with the Medicaid/CHIP CCS of measures. Data sources also represent a challenge. Most measures reported by state Medicaid agencies are derived from administrative data, but some measures may be derived from chart abstraction. Chart abstraction is an expensive and time-consuming process, and states may not have the resources to undertake the process. Electronically specified, clinical quality measures are promising and may help to reduce this burden while taking advantage of richer data types. However, neither traditional nor electronic chart data are able to provide parent- or adolescent-reported data that address the patient's and family's perspective on the content and quality of the care they receive. A challenge for pediatric health care providers and child health care institutions alike is the burden of multiple reporting requirements. Pediatric health care providers are asked to report quality measures for a variety of purposes including for government programs (eg, meaningful use for eligible providers), for accreditation (eg, patient-centered medical home), and for MOC. Hospitals report on many more programs, and often the same measures are reported for a variety of purposes. In addition, government incentive programs, health plans, accreditation organizations, and certification programs require different measures that may measure similar targets. This lack of alignment and harmonization among programs is burdensome for practitioners and health care institutions.

Implementing quality-improvement programs in pediatric practice is challenging with the many demands on the pediatric practitioner. Evaluating clinical quality and monitoring quality-improvement interventions require knowledge of quality-improvement techniques, can be time consuming, and may require resources that practices do not have. However, quality improvement is becoming an important part of everyday clinical practice. In the future, electronic and real-time data can and will facilitate the ability of pediatric practices to undertake quality-improvement initiatives.

#### **RECOMMENDATIONS**

For general pediatric health care providers and pediatric medical subspecialists:

1. Assess your practice's or institution's readiness to engage in quality-improvement activities, starting with identification of areas for improvement and learning about health care quality and quality measurement (see Table 1 for resources).
2. Champion quality measurement and quality improvement in your practice and within your institutions.
3. Consider investing in educating yourself and your practice on the science of quality improvement and measurement. Use existing resources and educational opportunities that will allow successful participation in changing payment models.
4. Consider engaging families and adolescents in the process of determining priority areas for practice improvement.
5. Consider setting quality-improvement goals for your practice and use quality measures to track progress. Understand the population served by your practice/clinic/institution to



more meaningfully prioritize quality-improvement goals and measurement and to allocate resources more effectively.

6. Consider participating in collaborative improvement networks.
7. Consider participating in advocacy activities on behalf of pediatric health care quality.

For national policy makers:

1. Increase federal and state investments in pediatric-specific quality measures, including support and promotion of development, testing, validation, endorsement, implementation, and stewardship of quality measures.
2. Increase federal investments overall in pediatric health care quality-improvement research.
3. Increase national clinician stakeholder organization support for education of current and future pediatric health care providers in quality improvement. Recognize quality-improvement activities as valid academic endeavors for promotion.
4. Support the expansion of the availability of pediatric-specific measures to include a broader array of health indicators that matter to families and pediatric health care providers and that better align with child health outcome goals. Adequate resources should be allocated toward the maintenance of a repository of available validated pediatric-specific measures that are useful for local quality-improvement activities as well as for reporting to state and federal agencies and other regulatory bodies.
5. Discourage the inappropriate use of adult measures for the assessment of child health in reporting programs.

6. Provide incentives to state Medicaid and CHIP agencies to support reporting on all measures within the CCS of measures. States could, in turn, provide incentives to health care practitioners to support state reporting.

7. Promote the dissemination, implementation, and use of existing validated, tested, and endorsed pediatric quality measures.

8. Quality measures, as much as possible, should be reportable by either International Classification of Diseases, 10th Revision, Clinical Modification, or Current Procedural Terminology category II codes to reduce burden on pediatric health care providers. However, the inclusion of measures that also capture patient-centered perspectives on care is essential.

9. Harmonize and align measures used in national/state reporting programs, including payment programs such as state Medicaid and private payers, accreditation bodies, regulatory agencies, and MOC programs to reduce reporting burden on physicians.

10. Harmonize and align measures across federal and state government maternal and child health (eg, Medicaid, Title V programs, federal health centers) and social service programs to reduce burden on providers and state agencies.

11. Develop a distinct ongoing process within the NQF for considering pediatric quality measures for endorsement. The content expertise required to assess child-specific measures differs from the expertise needed to assess adult measures, and because of the gaps in child-specific health measures when compared with adult measures, a separate process could expedite

endorsement and availability for use in federal and national programs.

#### LEAD AUTHORS

Terry Adirim, MD, MPH, FAAP  
Kelley Meade, MD, FAAP  
Kamila B. Mistry, PhD, MPH

#### CONTRIBUTING AUTHORS

Allan Stuart Lieberthal, MD, FAAP  
Rita Mangione-Smith, MD, FAAP  
Joel S. Tieder, MD, MPH, FAAP  
Mary Anne Whelan, MD, FAAP

#### COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY, 2014–2015

Wayne H. Franklin, MD, MPH, MMM, FAAP,  
Chairperson  
Terry Adirim, MD, MPH, FAAP  
David Gordon Bundy, MD, MPH, FAAP  
Laura Elizabeth Ferguson, MD, FAAP  
Sean Patrick Gleeson, MD, MBA, FAAP  
Michael Leu, MD, MS, MHS, FAAP  
Brigitta U. Mueller, MD, MHCM, FAAP  
Daniel Robert Neuspiel, MD, MPH, FAAP  
Michael Lawrence Rinke, MD, PhD, FAAP  
Richard N. Shiffman, MD, MCIS, FAAP  
Joel S. Tieder, MD, MPH, FAAP

#### LIAISONS

Cory J. Darrow, MD, FAAP – *AAP Section on Medical Students, Residents, and Fellowship Trainees*  
Kamila B. Mistry, PhD, MPH – *Agency for Healthcare Research and Quality*  
Suzette Oyeku, MD, FAAP – *National Institute for Children's Health Quality*  
Lisa Rossignol – *Council on Quality Improvement and Patient Safety Parent Liaison*  
Mimi Saffer – *Children's Hospital Association*

#### STAFF

Lisa Krams, MS

#### COMMITTEE ON PRACTICE AND AMBULATORY MEDICINE, 2014–2015

Geoffrey R. Simon, MD, FAAP, Chairperson  
Cynthia N. Baker, MD, FAAP  
Graham Arthur Barden III, MD, FAAP  
Oscar "Skip" Wharton Brown III, MD, FAAP  
Jesse M. Hackell, MD, FAAP  
Amy Peykoff Hardin, MD, FAAP  
Kelley E. Meade, MD, FAAP  
Scot Benton Moore, MD, FAAP  
Julia Richerson, MD, FAAP

#### STAFF

Elizabeth Sobczyk, MPH

## ABBREVIATIONS

AAP: American Academy of Pediatrics  
ACO: accountable care organization  
CCS: Child Core Set  
CHIP: Children's Health Insurance Program  
CHIPRA: Children's Health Insurance Program Reauthorization Act  
CMS: Centers for Medicare and Medicaid Services  
COE: Center of Excellence  
DHHS: Department of Health and Human Services  
HEDIS: Healthcare Effectiveness Data and Information Set  
MACRA: Medicare Access and CHIP Reauthorization Act of 2015  
MOC: maintenance of certification  
NCQA: National Committee for Quality Assurance  
NQF: National Quality Forum  
PQMP: Pediatric Quality Measures Program  
URAC: [formerly] Utilization Review Accreditation Commission

## REFERENCES

1. Panzer RJ, Gitomer RS, Greene WH, Webster PR, Landry KR, Riccobono CA. Increasing demands for quality measurement. *JAMA*. 2013;310(18):1971–1980
2. Stille C, Turchi RM, Antonelli R, et al; Academic Pediatric Association Task Force on Family-Centered Medical Home. The family-centered medical home: specific considerations for child health research and policy. *Acad Pediatr*. 2010;10(4):211–217
3. Raphael J, Sadof M, Stille C, et al. Not just little adults: considerations for quality measures of child health. National Quality Measures Clearinghouse Expert Commentaries. Rockville, MD: Agency for Healthcare Research and Quality; April 7, 2014. Available at: [www.qualitymeasures.aahrq.gov/expert/expert-commentary.aspx?id=47906](http://www.qualitymeasures.aahrq.gov/expert/expert-commentary.aspx?id=47906). Accessed September 8, 2015
4. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press; 2001
5. Centers for Medicare and Medicaid Services. Clinical quality measures basics. Baltimore, MD: Centers for Medicare and Medicaid Services. Available at: [www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/ClinicalQualityMeasures.html](http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/ClinicalQualityMeasures.html). Accessed September 8, 2015
6. Donabedian A. *The Definition of Quality and Approaches to Its Assessment*. Ann Arbor, MI: Health Administrative Press; 1980
7. Donabedian A. Evaluating the quality of medical care. *Milbank Mem Fund Q*. 1966;44(3 suppl):166–206
8. US Food and Drug Administration. Guidance for industry. Patient-reported outcome measures: use in medical product development to support labeling claims. *Fed Regist*. 2009;74(235):65132–65133
9. National Quality Forum. Patient reported outcomes in performance measurement. Washington, DC: National Quality Forum; January 10, 2013. Available at: [www.qualityforum.org/Publications/2012/12/Patient-Reported\\_Outcomes\\_in\\_Performance\\_Measurement.aspx](http://www.qualityforum.org/Publications/2012/12/Patient-Reported_Outcomes_in_Performance_Measurement.aspx). Accessed September 8, 2015
10. American Medical Association. Physician Consortium for Performance Improvement: measure development process. Available at: <https://www.thepcpi.org/programs-initiatives/measurement-science/measure-development/>. Accessed September 8, 2015
11. Byron SC, Gardner W, Kleinman LC, et al. Developing measures for pediatric quality: methods and experiences of the CHIPRA pediatric quality measures program grantees. *Acad Pediatr*. 2014;14(5 suppl):S27–S32
12. National Committee for Quality Assurance. HEDIS measures. Available at: [www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures.aspx](http://www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures.aspx). Accessed September 8, 2015
13. Mistry KB, Chesley F, LLanos K, Dougherty D. Advancing children's health care and outcomes through the Pediatric Quality Measures Program. *Acad Pediatr*. 2014;14(5 suppl):S19–S26
14. National Quality Forum. Measures applications partnership. Available at: [www.qualityforum.org/setting\\_priorities/partnership/measure\\_applications\\_partnership.aspx](http://www.qualityforum.org/setting_priorities/partnership/measure_applications_partnership.aspx). Accessed September 8, 2015
15. National Quality Forum. Consensus development process. Available at: [www.qualityforum.org/Measuring\\_Performance/Consensus\\_Development\\_Process.aspx](http://www.qualityforum.org/Measuring_Performance/Consensus_Development_Process.aspx). Accessed September 8, 2015
16. Agency for Healthcare Research and Quality. The six domains of health care quality. Available at: <https://cahps.aahrq.gov/consumer-reporting/talkingquality/create/sixdomains.html>. Accessed September 8, 2015
17. Institute of Medicine. *Performance Measurement: Accelerating Improvement*. Washington, DC: National Academies Press; 2005
18. Taylor MJ, McNicholas C, Nicolay C, Darzi A, Bell D, Reed JE. Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. *BMJ Qual Saf*. 2014;23(4):290–298
19. Institute for Healthcare Improvement. How to improve. Available at: [www.ihl.org/resources/Pages/HowtoImprove/default.aspx](http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx). Accessed September 8, 2015
20. Accreditation Council for Graduate Medical Education. ACGME program requirements for graduate medical education in pediatrics. Chicago, IL: Accreditation Council for Graduate Medical Education; 2013. Available at: [https://www.acgme.org/acgmeweb/Portals/0/PFAssets/2013-PR-FAQ-PIF/320\\_pediatrics\\_07012013.pdf](https://www.acgme.org/acgmeweb/Portals/0/PFAssets/2013-PR-FAQ-PIF/320_pediatrics_07012013.pdf). Accessed September 8, 2015
21. Beck M. Debate heightens over measuring health-care quality. *Wall Street Journal*. January 31, 2015. Available at: [www.wsj.com/articles/debate-heightens-over-measuring-](http://www.wsj.com/articles/debate-heightens-over-measuring-)

- health-care-quality-1422661664. Accessed September 8, 2015
22. Centers for Medicare and Medicaid Services. Medicaid: managed care—final rule. Available at: <https://www.medicare.gov/medicaid-chip-program-information/by-topics/delivery-systems/managed-care/managed-care-site.html>. Accessed September 15, 2016
  23. Rosenbaum S. Twenty-first century Medicaid: the final managed care rule. Health Affairs Blog. May 5, 2016. Available at: <http://healthaffairs.org/blog/2016/05/05/twenty-first-century-medicare-the-final-managed-care-rule/>. Accessed September 15, 2016
  24. National Committee for Quality Assurance. Patient-centered medical home recognition. Available at: [www.ncqa.org/Programs/Recognition/Practices/PatientCenteredMedicalHomePCMH.aspx](http://www.ncqa.org/Programs/Recognition/Practices/PatientCenteredMedicalHomePCMH.aspx). Accessed September 8, 2015
  25. National Committee for Quality Assurance. Health plan accreditation. Available at: [www.ncqa.org/Programs/Accreditation/HealthPlanHP.aspx](http://www.ncqa.org/Programs/Accreditation/HealthPlanHP.aspx). Accessed September 8, 2015
  26. Utilization Review Accreditation Commission. Accreditation and measurement. Available at: <https://www.urac.org/accreditation-and-measurement/accreditation-and-measurement/>. Accessed September 8, 2015
  27. The Joint Commission. Performance measurement. Available at: [www.jointcommission.org/performance\\_measurement.aspx](http://www.jointcommission.org/performance_measurement.aspx). Accessed September 8, 2015
  28. The Leapfrog Group Web site. Available at: [www.leapfroggroup.org/](http://www.leapfroggroup.org/). Accessed September 8, 2015
  29. Mangione-Smith R, Schiff J, Dougherty D. Identifying children's health care quality measures for Medicaid and CHIP: an evidence-informed, publicly transparent expert process. *Acad Pediatr*. 2011;11(3 suppl):S11–S21
  30. Children's Health Insurance Program Reauthorization Act of 2009. Pub L No. 111-3 (2009)
  31. National Institutes of Health. AHRQ FOA RFA-HS-16-002: "Pediatric Quality Measures Program (PQMP): Dissemination and Implementation of Child Health Quality Measures Cooperative Research Grants (U18)". Available at: <http://grants.nih.gov/grants/guide/rfa-files/RFA-HS-16-002.html>. Accessed September 15, 2016
  32. Burwell SM. Setting value-based payment goals—HHS efforts to improve U.S. health care. *N Engl J Med*. 2015;372(10):897–899
  33. Patient Protection and Affordable Care Act, 42 USC §18001 et seq (2010)
  34. Centers for Medicare and Medicaid Services. Value-based purchasing. Available at: <https://www.healthcare.gov/glossary/value-based-purchasing-vbp/>. Accessed September 8, 2015
  35. Porter ME. What is value in health care? *N Engl J Med*. 2010;363(26):2477–2481
  36. Forrest CB, Silber JH. Concept and measurement of pediatric value. *Acad Pediatr*. 2014;14(5 suppl):S33–S38
  37. McClellan M, McKethan AN, Lewis JL, Roski J, Fisher ES. A national strategy to put accountable care into practice. *Health Aff (Millwood)*. 2010;29(5):982–990
  38. Centers for Medicare and Medicaid Services. Accountable care organizations. Available at: <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/index.html?redirect=/ACO>. Accessed September 8, 2015
  39. Silversmith J; MMA Work Group to Advance Health Care Reform. Five payment models: the pros, the cons, the potential. *Minn Med*. 2011;94(2):45–48
  40. Mechanic RE. Opportunities and challenges for episode-based payment. *N Engl J Med*. 2011;365(9):777–779
  41. Mechanic RE, Altman SH. Payment reform options: episode payment is a good place to start. *Health Aff (Millwood)*. 2009;28(2):w262–w271
  42. Robinow A. The potential of global payment: insights from the field. New York, NY: The Commonwealth Fund; February 2010. Available at: [www.commonwealthfund.org/~media/Files/Publications/Fund%20Report/2010/Feb/1373\\_Robinow\\_potential\\_global\\_payment.pdf](http://www.commonwealthfund.org/~media/Files/Publications/Fund%20Report/2010/Feb/1373_Robinow_potential_global_payment.pdf). Accessed September 8, 2015
  43. Rajkumar R, Conway PH, Tavenner M. CMS—engaging multiple payers in payment reform. *JAMA*. 2014;311(19):1967–1968

## A New Era in Quality Measurement: The Development and Application of Quality Measures

Terry Adirim, Kelley Meade, Kamila Mistry, COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY and COMMITTEE ON PRACTICE AND AMBULATORY MANAGEMENT

*Pediatrics* 2017;139;

DOI: 10.1542/peds.2016-3442 originally published online December 26, 2016;

### Updated Information & Services

including high resolution figures, can be found at:  
<http://pediatrics.aappublications.org/content/139/1/e20163442>

### References

This article cites 16 articles, 3 of which you can access for free at:  
<http://pediatrics.aappublications.org/content/139/1/e20163442.full#ref-list-1>

### Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):

#### **Current Policy**

[http://classic.pediatrics.aappublications.org/cgi/collection/current\\_policy](http://classic.pediatrics.aappublications.org/cgi/collection/current_policy)

#### **Committee on Practice & Ambulatory Medicine**

[http://classic.pediatrics.aappublications.org/cgi/collection/committee\\_on\\_practice\\_-\\_ambulatory\\_medicine](http://classic.pediatrics.aappublications.org/cgi/collection/committee_on_practice_-_ambulatory_medicine)

#### **Administration/Practice Management**

[http://classic.pediatrics.aappublications.org/cgi/collection/administration:practice\\_management\\_sub](http://classic.pediatrics.aappublications.org/cgi/collection/administration:practice_management_sub)

#### **Quality Improvement**

[http://classic.pediatrics.aappublications.org/cgi/collection/quality\\_improvement\\_sub](http://classic.pediatrics.aappublications.org/cgi/collection/quality_improvement_sub)

### Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:  
<https://shop.aap.org/licensing-permissions/>

### Reprints

Information about ordering reprints can be found online:  
<http://classic.pediatrics.aappublications.org/content/reprints>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since . Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2017 by the American Academy of Pediatrics. All rights reserved. Print ISSN:

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™





# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **A New Era in Quality Measurement: The Development and Application of Quality Measures**

Terry Adirim, Kelley Meade, Kamila Mistry, COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY and COMMITTEE ON PRACTICE AND AMBULATORY MANAGEMENT

*Pediatrics* 2017;139;

DOI: 10.1542/peds.2016-3442 originally published online December 26, 2016;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/139/1/e20163442>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since . Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2017 by the American Academy of Pediatrics. All rights reserved. Print ISSN:

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

