



## POLICY STATEMENT

# Principles for the Development and Use of Quality Measures

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

Steering Committee on Quality Improvement and Management and Committee on Practice and Ambulatory Medicine

## ABSTRACT

The American Academy of Pediatrics and its members are committed to improving the health care system to provide the highest-quality and safest health care for infants, children, adolescents, and young adults. This statement is intended as a guide for pediatricians and pediatric leadership on the appropriate uses of quality measures and the criteria on which they should be based. The statement summarizes the current national efforts on quality measurement and provides a set of principles for the development, use, and evaluation of quality measures for improving children's health and health care. The American Academy of Pediatrics recommends that these measures address important issues for children; be appropriate for children's health and health care, scientifically valid, and feasible; and focus on what can be improved. In addition, the American Academy of Pediatrics supports reasonable principles for the oversight and implementation of pay-for-performance programs.

## INTRODUCTION

The American Academy of Pediatrics (AAP) and its members are committed to improving the health care system to provide the highest-quality and safest health care for infants, children, adolescents, and young adults. This statement, based on available evidence and committee expertise, provides information on pediatric quality measurement and a set of principles for the development and appropriate use of quality measures. In addition, this information may be helpful for employer groups, health plans, and other organizations involved in the development and evaluation of child health quality measures.

## OPPORTUNITIES FOR IMPROVEMENT IN CHILDREN'S HEALTH

Pediatricians and other child health clinicians strive to provide the best care for children and families. Despite excellent intentions and pockets of superb care, numerous studies, including the Commonwealth Fund's *Quality of Health Care for Children and Adolescents: A Chartbook*,<sup>1</sup> the *National Healthcare Disparities Report*,<sup>2</sup> and the *National Healthcare Quality Report*,<sup>3</sup> have shown considerable variation in outcomes of care across providers and communities<sup>4-5</sup> and in utilization, safety, and quality care for all children<sup>6-8</sup> as well as significant disparities in these dimensions for minority children. A major opportunity exists to improve care in a way that will make a real difference in the lives of children and families. To close the gaps in children's health care, an initial step is the use of measures to identify opportunities for improvement and track changes in quality over time as interventions are implemented.

## DEFINING AND MEASURING QUALITY

The Institute of Medicine (IOM) defines quality of care as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."<sup>9</sup> A quality measure is a quantification of the degree to which a desired health care process or outcome is achieved or the extent that a desirable structure to support health care delivery is in place.<sup>8</sup>

Quality measures assess 3 levels of health care and its intended results: structure, process, and outcome.<sup>10</sup> Structure measures address "sufficiency of resources and proper system design"<sup>11</sup> including organizational characteristics, such as the type of care provided (eg, primary or specialty) or the use of specific systems for improving care (eg, an electronic health record [EHR] or registry).

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### Key Words

accountability, efficiency measures, outcome measures, pay-for-performance, process measures, quality, quality improvement, quality measures, quality of care, structure measures

### Abbreviations

AAP—American Academy of Pediatrics  
IOM—Institute of Medicine  
EHR—electronic health record  
ADHD—attention-deficit/hyperactivity disorder  
PCPI—Physician Consortium for Performance Improvement  
NQF—National Quality Forum  
AQA—Ambulatory Care Quality Alliance  
AHRQ—Agency for Healthcare Research and Quality  
P4P—pay-for-performance  
MOC—maintenance of certification  
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**TABLE 1 National Health Care Quality Report Matrix: Combines 4 of the IOM Health Care Quality Components and the FACCT Consumer Perspectives on Health Care Needs, With Equity as the Third Dimension**

Consumer Perspectives on Health Care Needs	Components of Health Care Quality			
	Safety	Timeliness	Effectiveness	Patient-Centeredness
Staying healthy	Fluoride only when needed	Access to well-child care	Immunizations	Social history assessment
Getting better	Drug-allergy check before prescribing medications	Access to urgent care	Appropriate antibiotics for upper respiratory infections	Family involvement during hospital rounds
Living with illness or disability	Medication reconciliation	Access to long-term care	Inhaled steroids for persistent asthma	Family involvement in developing long-term plan of care
Coping with the end of life	Avoid unnecessary painful interventions	Access to hospice care	Effective end-of-life pain management	Advance directive

Components of health care quality include (1) safety: "avoiding injuries to patients from care that is intended to help them"; (2) effectiveness: "providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit (avoiding overuse and underuse)"; (3) patient-centeredness: establishing "a partnership among practitioners, patients, and their families (when appropriate) to ensure that decisions respect patients' wants, needs, and preferences"; and (4) timeliness: "obtaining needed care and minimizing unnecessary delays in getting that care." Consumer perspectives on health care needs include (1) staying healthy; preventive care; (2) getting better: acute care; (3) living with illness or disability: chronic care; and (4) coping with the end of life: end-of-life care. Equity is "a crosscutting issue" that is "the provision of health care of equal quality to those who may differ in personal characteristics that are not inherently linked to health, such as gender, ethnicity, geographic location, socioeconomic status, or insurance coverage" and means that "quality of care is based on needs and clinical factors."

Process measures address the interaction between the patient and the provider.<sup>11</sup> How are care and services provided (eg, assessment, evaluation, diagnosis, and treatment)? How well is the patient able to access care once he or she accesses the health care system? Examples of process measures include the provision of a written asthma management plan to a family and the use of a standardized assessment to evaluate and diagnose comorbidities in a child with attention-deficit/hyperactivity disorder (ADHD).

Outcome measures describe how the care delivered affects the patient's health, health status, and function. Functional status, quality of life, and mortality are examples of outcome measures. Intermediate outcome measures are linked to end-point outcomes such as disability or death. Emergency department visits or hospitalizations attributable to asthma and control of blood pressure and high cholesterol are examples of intermediate measures.

Quality improvement efforts often focus on structural or process measures associated with health outcomes, because the outcomes of interest may occur too infrequently to demonstrate change in a practical time interval. For example, research has shown that the use of inhaled corticosteroids for persistent asthma, which can be assessed by use of a process measure, results in decreased hospitalizations and emergency department visits, which can be evaluated as outcome measures; therefore, an increase in the use of inhaled steroids has become a primary improvement objective in the care of children with persistent asthma.<sup>12</sup>

Frameworks for assessing and reporting health care quality<sup>13</sup> recommend that quality measures be available across a range of quality domains and address consumer needs across the continuum of care. The IOM<sup>14</sup> specified 6 domains for improving quality: safety, timeliness, effectiveness, efficiency, equity, and patient/family-centeredness. The Foundation for Accountability highlighted consumer needs with regard to navigating the

health care system by identifying 4 domains: staying healthy, getting better (acute care), living with illness (chronic care), and care at the end of life.<sup>13</sup> FAACCT, a now-closed national not-for-profit organization, coordinated the development of several child quality-measurement tools aligned with this framework under the rubric of the still-operating Child and Adolescent Health Measurement Initiative. Payers and purchasers are increasingly interested in measures of efficiency, which has been defined as the cost of care associated with a specified level of quality of care.<sup>13</sup>

Ultimately, quality measures should be available to address each domain of quality across all patient and family needs. Measures can be specific to conditions (eg, treatment of asthma in children), which is often the case for measures of clinical effectiveness. Other measures might cut across conditions to reflect a domain of quality (eg, health care-acquired infection, patient experience with care). The patient and family are key sources of information about many aspects of the quality of care they receive, in particular the degree to which care was family centered. The interface between the consumer and quality domains, as conceptualized by the IOM, is illustrated in Table 1.<sup>13</sup>

The inclusion of consumer perspectives on health care needs in the matrix is helpful in framing the pediatric approach to quality. A significant amount of pediatric health care, such as well-child care, focuses on the "staying healthy" part of the matrix. Management of conditions such as upper respiratory infections, acute otitis media, acute gastroenteritis, and bronchiolitis deals with "getting better." The component "living with illness or disability" addresses the fact that pediatricians routinely manage children with special health care needs (ie, congenital heart disease, cancer, chronic lung disease, diabetes, and ADHD). Also, as pediatricians treat increasing numbers of children with chronic illnesses, they may increasingly face management of end-of-life issues. Pediatric quality measures should also address

care at the beginning of life that affects infant mortality and morbidity and the transitions in care throughout the life span. For patients of all ages, safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity are important as well.

### THE USE OF MEASURES

Measurement for continuous quality improvement can be used to help a practice or organization understand its own care processes, understand how its performance compares with others, and track measures in response to changes. Data can be used by a practice or organization to compare its performance with (1) itself over time, (2) other practices or organizations using the same measures and collecting data in the same way, and (3) exemplary practices or organizations.<sup>12</sup> Initial steps in improvement efforts involve the use of measures to document performance gaps followed by a plan to address needed changes, monitoring of performance, and outcome. Practices and providers are encouraged to engage in quality improvement as part of daily pediatric practice. When paired with continuing education, quality improvement can be part of the process of ongoing focus on optimal patient care.

The pediatric community has been very active in researching the effectiveness of health care quality improvement strategies. Researchers at the University of California in San Francisco who worked with a large health plan found that chlamydia screening and a broader set of adolescent-focused preventive services could be increased during well-adolescent visits.<sup>15</sup> Cloutier worked with public- and private-sector primary care providers to increase the use of care processes outlined in asthma guidelines,<sup>16</sup> and Lozano and colleagues found that leadership training and practice redesign using a nurse educator reduced asthma-symptom days,<sup>17</sup> a strategy that was highlighted as effective in a recent evidence review of asthma quality improvement strategies.<sup>18</sup> Current pediatric quality improvement research focuses on using health information technology to facilitate improvement in delivery of effective care and in patient safety.<sup>19</sup>

A recent review summarized the characteristics of ideal quality measures and concluded that significant barriers exist in using clinical quality measures at the provider level to distinguish the performance of 1 physician compared with another.<sup>20</sup> These barriers include (1) the lack of adequate sample size for reliable estimates of individual physician performance, (2) the challenges of adjusting for confounding patient factors, (3) the difficulty of attributing care to the individual physician, and (4) inadequate systems for collection and analysis of clinical data, particularly process data.

The IOM has outlined uses of quality measures that involve accountability as well as improvement, including (1) ensuring the rapid translation of clinical research into practice, (2) holding providers accountable for delivering high-quality care, (3) setting standards for participation in federally sponsored programs including Medicaid, the State Children's Health Insurance Program (SCHIP), Title V, and community health centers,

(4) helping parents and purchasers make choices, (5) establishing benchmarks to stimulate quality improvement, and (6) conducting ongoing national surveillance on trends in quality.<sup>21</sup> These applications have the potential to involve a variety of users including consumers, providers, medical specialty boards, purchasers, payers, business coalitions, accrediting organizations, and government.

### CURRENT STATUS OF NATIONAL QUALITY MEASUREMENT INITIATIVES

Several diverse health care stakeholders are interested in and are developing standardized quality measures. The Congressionally mandated *National Healthcare Disparities Report*<sup>2</sup> and *National Healthcare Quality Report*<sup>3</sup> included a broad set of performance and outcome indicators to monitor the nation's progress toward improved health care quality. Recent calls for measures by national organizations have yielded hundreds of submissions, which is proof of the tremendous activity in this area.

There are many organizations actively involved in the development and promulgation of quality measures. The American Medical Association Physician Consortium for Performance Improvement (PCPI) includes representatives from more than 140 US medical specialty and state medical societies, federal agencies, and other organizations convened to identify and develop evidence-based clinical quality measures that enhance quality of patient care and foster accountability. The AAP is a member of the PCPI and has developed pediatric measures for or relating to acute gastroenteritis, otitis media with effusion, and otitis externa through the PCPI process.<sup>22</sup>

The National Quality Forum (NQF) leads a national effort around quality measures with broad participation from various health care stakeholders including national, state, regional, and local groups that represent health care professionals, consumers, public and private purchasers, employers, hospitals, health plans, and other organizations involved in health care research or quality improvement. The NQF was created to improve American health care through the endorsement of consensus-based national standards for measurement and public reporting of health care performance data that provide meaningful information about whether care meets the 6 IOM quality domains.<sup>23</sup> The AAP is a member of the NQF.

The AAP also participates in the Ambulatory Care Quality Alliance (AQA), an increasingly important and growing multistakeholder collaborative that comprises medical specialty boards and societies, purchasers, consumers, health plans, and accrediting organizations with a mission to coalesce around a single standardized set of physician-level measures.<sup>24</sup> The AQA primary care measure set includes several measures deemed appropriate for use in child health care settings.

In 2006, the AQA and the Hospital Quality Alliance, a public-private collaboration to improve the quality of care provided by the nation's hospitals, formed a new national Quality Alliance Steering Committee to better coordinate the promotion of quality measurement, transparency, and improvement in care. The new steer-

ing committee will work closely with the Centers for Medicare and Medicaid Services and Agency for Healthcare Research and Quality (AHRQ).<sup>25</sup>

Various policy makers, payer organizations, and purchasers and employer groups are developing provider incentive or pay-for-performance (P4P) programs based on standardized measures to drive improvements in the quality of care. Many of these groups also are using measures for public reporting, an approach that requires rigorous evaluation and greater transparency in the development and use of these measures. Although there is little research on the effectiveness of reward programs on quality,<sup>26</sup> the current enthusiasm for P4P programs is based on the belief that these incentive efforts will lead to significant improvements in the quality of care.<sup>27</sup>

To date, most national quality measurement efforts have not focused on children. Measures exist for a few conditions and domains, such as asthma, patient safety, some preventive services (eg, immunizations, well-child care visits), and patient experience with care (eg, timeliness, communication, and respect). However, measures for other important pediatric issues, such as the evaluation of developmental assessment and perinatal/neonatal care, have not been frequently used.

Measurement activities that focus on children and adolescents include efforts to develop quality measures for Medicaid and the State Children's Health Insurance Program<sup>28</sup> and measures developed by the Child and Adolescent Health Measurement Initiative,<sup>29</sup> including the online data resource center for child and adolescent health.<sup>30</sup> The data resource center provides information about children's health, health care needs, and quality of care for many subgroups of children nationally and in each state.

The National Association of Children's Hospitals and Related Institutions, Child Health Corporation of America, Medical Management Planning/BENCHMARKING Effort for Networking Children's Hospitals, and others have been working collaboratively to develop measure sets. These have focused on hospital care for children and adolescents to date.<sup>31</sup> The California Hospital Assessment and Reporting Taskforce, a voluntary statewide effort to measure inpatient quality, has focused on adult inpatient care but began reporting on select pediatric measures in 2007.

The National Committee on Quality Assurance has generated several pediatric measures for the Health Plan Employer Data and Information Set, including measures for child and adolescent immunization, overuse of antibiotics in pharyngitis, asthma treatment, and follow-up for ADHD.<sup>32</sup> In addition, the Health Plan Employer Data and Information Sheet 2006 reporting set includes Consumer Assessment of Healthcare Providers and Systems (CAHPS) 3.0H surveys directed to sampled adult and child Medicaid beneficiaries and sampled adults and children with commercial coverage who are managed care members. The child surveys include supplemental items that can be used to assess the experience of care for children with chronic conditions. In 2007, the AHRQ released clinician and group CAHPS surveys, including a child primary care survey.

The AHRQ recently released the Pediatric Quality Indicators, which can be used with hospital inpatient discharge data to identify potential quality improvement opportunities.<sup>33</sup>

Finally, the new Alliance for Pediatric Quality recently launched the Improve First plan to select improvement priorities on the basis of pediatric health care issues that have broad impact and for which there are ongoing, evidence-based improvement programs with associated quality measures.<sup>34</sup> The Alliance for Pediatric Quality was formed by 4 organizations recognized as leaders in pediatric care—the AAP, the American Board of Pediatrics, the Child Health Corporation of America, and the National Association of Children's Hospitals and Related Institutions—which came together to establish a unified voice for issues related to improving the quality of pediatric health care. The founding member organizations represent large segments of the pediatric health care community and bring unique and synergistic perspectives to the field of quality care for children. One of the first areas of focus for the Alliance for Pediatric Quality will be operationalizing quality improvement in pediatric health care through the use of quality measures, evidence-based medicine, health information technology, shared data, and policy to systematically improve children's health care.

Additional activities that will drive further focus on the use of quality measurement in practice include the adoption of maintenance of certification (MOC) by the American Board of Pediatrics,<sup>35</sup> which emphasizes assessment and improvement of quality of care in practice as a requirement for ongoing certification, and the Accreditation Council for Graduate Medical Education adoption of core competencies for physicians in training, which include competency in practice-based learning and quality improvement.<sup>35</sup>

Some health plans are beginning to incorporate MOC as 1 dimension of P4P programs. For example, Aetna Inc and UnitedHealthcare officially recognized the American Board of Internal Medicine's MOC in their respective P4P programs.<sup>36</sup> Under the American Board of Internal Medicine's MOC program, physicians complete Web-based tools called practice improvement modules that guide them through a quality improvement process that uses data collected from their own clinical practice.<sup>37</sup>

Quality measurement and assessment can be facilitated significantly through the use of well-designed and well-implemented EHRs. Programming specific measures into the design and production of EHRs would not only allow for standardization but also ease the burden of data collection and aggregation.<sup>38</sup> The AAP is working closely with the EHR industry and certification groups (eg, Certification Commission on Health Information Technology<sup>39</sup>) to ensure the inclusion of standard measures in the design and production of EHRs to facilitate quality data collection, which is incorporated into the workflow of clinical practice.

#### CHILD-SPECIFIC ISSUES

The 2004 IOM publication *Children's Health, the Nation's Wealth*<sup>40</sup> emphasizes the critical differences between chil-

dren and adults that warrant special attention to children's health. This report notes that data on children's health and its influences are needed to maximize the health of individuals from childhood through adulthood. Children represent a population with unique health care needs, often called the "4 Ds."<sup>41</sup>

- **Development:** Children experience rapid developmental changes during infancy, childhood, and adolescence. These changes should be taken into account when developing and using measures. For example, different schedules and types of immunizations should be measured at different ages. Developmental changes also affect the extent to which children's own assessments can be used to measure aspects of quality, such as patient-centeredness and timeliness.<sup>42</sup>
- **Dependency:** Children depend on caregivers for many aspects of care. Parents and guardians play substantial roles in aspects of quality, such as the actual use of prescribed drugs, devices, and services. Careful specification of data sources and risk adjustment are essential for adequately adjusting for factors that influence specific care.
- **Differential epidemiology:** Most adult and generic quality indicators focus on specific diseases rather than health. The relatively low rates of children with most specific serious chronic illnesses and disabilities can make quality measurement and use of measures difficult, because the provider, practice, and plan-level sample size may be too small for meaningful comparison. Measures of preventive services and cross-cutting measures of quality for children with special health care needs can be used in addition to condition-specific measures.<sup>43</sup>
- **Demographics:** Currently, two fifths of the nation's children are from minority groups<sup>44</sup> and almost one fifth live in poverty,<sup>45</sup> which are rates higher than those for adults.<sup>46</sup> Health care quality for children differs according to race, ethnicity, and income, and these factors are important to capture in measurement strategies.

These 4 Ds create unique challenges in development of valid quality measures for children and children's health care. It is necessary to consider these child-specific factors when developing and using appropriate quality measures for pediatric health care issues. In addition, children, adolescents, and families play an important role in providing information about the quality of clinical care. Learning about their experiences of care and engaging in partnerships to improve care are essential for achieving the best outcomes. One way to achieve this engagement is by using measures that address factors important to families.

Those who develop and use pediatric measures must acknowledge that much of children's health care is focused on promoting healthy development and prevention. In addition, because of the relatively low numbers of children with any 1 condition, non-condition-specific

measures may need to be considered (eg, coordination of care for children with special health care needs).

## RECOMMENDATIONS

The AAP and its members are committed to providing the best and safest health care for infants, children, adolescents, and young adults. The AAP strongly supports health care quality improvement endeavors and believes that measures are an important component of improving quality. The AAP believes that the primary purpose of quality measurement should be to identify opportunities to improve patient care and outcomes, including health status and satisfaction. The AAP supports the use of quality measures in the spirit of continuous quality improvement and affirms the importance of partnership with children and families in these improvement efforts. Toward this end, the AAP offers the following recommendations for quality measurement.

1. Measures should address important issues for children. Measures should address topics of substantial impact, whether defined by prevalence, severity, and/or functional status, and should be chosen for their potential influence on children's health by addressing a significant gap between current and ideal practice. In addition, measures should enable an assessment of systematic disparities in the quality of care for vulnerable groups.
2. Measures should be appropriate for children's health. Any effort to measure quality should take into account the unique features of children's health and health care and recognize the importance of development, dependency, demographics, and disparities. Measures must reflect the differential epidemiology in children as compared with adults and include patient and family participation.
3. Measures should be scientifically valid. Measures should be based on best evidence available and linked to evidence-based practice. The strength and quality of evidence on which the measures are based should be transparent and explicitly documented. The AAP will continue to produce evidence-based pediatric clinical practice guidelines, which will add to the foundation for the continued development of valid quality measures. In addition, measures should be reliable and be field-tested to demonstrate the potential for improvements in quality. Rigorous testing should clearly demonstrate that they accurately assess what they are intended to measure. When appropriate, measures should include risk adjustment or stratification to take into account factors beyond a practice's or health system's control, such as socioeconomic status, health insurance, and comorbid conditions.
4. Measures should be feasible. Collection of data to support the measures should not cause undue burden on the clinician or patients and families. Issues to be considered include the number of required measures, the time interval of collection, and the resources re-

quired for collection. Ideally, data automatically collected in patient care and other health care processes should be used for measurement. Measures must have clear definitions and specific instructions for collection. Data collection must include adequate sampling.

Measures should be appropriate for the use and setting proposed (eg, ambulatory or hospital care, primary or specialty care). Measures also should be tailored to various practice settings (eg, solo practice, large group practice, academic practice) as appropriate.

Measures and results should be easily interpretable by users. The format used to report measures should include appropriate data analysis and display and prove useful to clinicians. Measures displayed over time and augmented with control limits when enough data are available (eg, time-series charts) will dissuade users from misinterpreting random variation in the measure and can focus analysis of performance on important changes in care delivery, whether stimulated by quality improvement efforts or other factors. The interpretation of measures should include the use of methods to allow a focus on both the causes of variation and the benchmarks or targets.

In addition, collection and reporting of measures must ensure patient privacy.

5. Measures should address what can be improved. Quality measures should focus on improvable issues that clinicians and health systems can influence.

In addition to the recommendations defined above, the AAP also supports the P4P principles outlined by the American Academy of Family Physicians<sup>47</sup>:

1. focus on improved quality of care;
2. support the physician-patient relationship;
3. use evidence-based clinical guidelines;
4. involve practicing physicians in program design;
5. use reliable, accurate, and scientifically valid data;
6. provide positive physician incentives; and
7. offer voluntary physician participation.

## CONCLUSIONS

The AAP and its members are committed to providing the highest-quality and safest health care for infants, children, adolescents, and young adults. Quality measurement is necessary for the continuous improvement of the health care system. As a result, national attention has increasingly focused on quality measurement; however, these national efforts often have failed to recognize the unique needs of children and their families. The pediatric community must take a leadership role.

The AAP is taking the lead in assessing quality measures proposed for children's health and health care by developing pediatric measures in collaboration with national health care quality organizations, monitoring the validity of measures developed by other organizations,

and advocating for the appropriate use of measures to support improvement in the health care of children. These activities are strengthened by the AAP continuing to develop evidence-based pediatric clinical practice guidelines and being involved with the EHR industry and certification groups to facilitate quality data collection. The AAP will advocate for the use of pediatric measurement data, including use in public reporting, when data are based on validated pediatric measures that are appropriately constructed for quality improvement in children's health care and pediatric practices.

In partnership with the Alliance for Pediatric Quality and other organizations, the AAP will endeavor to ensure that quality metrics are used to accelerate changes in care that result in measurably improved health and outcomes for children and their families.

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