

An abstract graphic featuring a series of blue bars of increasing height from left to right, overlaid with a large, stylized orange arrow pointing upwards and to the right. The background is divided into three horizontal bands: light blue at the top, orange in the middle, and light blue at the bottom.

ORAL HEALTH QUALITY IMPROVEMENT IN THE ERA OF ACCOUNTABILITY

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ORAL HEALTH QUALITY IMPROVEMENT IN THE ERA OF ACCOUNTABILITY

Table of Contents

Introduction..... 1

What is Quality in Health Care? 2

 Definitions of Quality..... 2

 Quality Assurance vs. Quality Improvement 3

 Six Aims for Quality Improvement 3

Drivers of Quality Improvement in the U.S. Health Care System..... 3

 The Skyrocketing Cost of Health Care..... 3

 Unwarranted Variations in Care Costs and Health Outcomes..... 4

 Health Disparities Among Populations 5

Improving Health Through Measurement and Quality Improvement Systems 5

 Measurement and Health Disparities 5

 Pay-for Performance and Accountable Health Care..... 6

 The Quality Movement..... 6

 Quality Improvement and Health Information Technology 8

Quality Improvement and Oral Health 8

 Drivers of Oral Health Quality Improvement 8

 Oral Health Care Expenditures 8

 Unwarranted Variability and Outcomes 9

 Oral Health Disparities 9

 A Hierarchy of Quality Improvement Activities 10

Quality Improvement Activities in Oral Health..... 11

 Sectors of the Oral Health Industry 11

 Federal or National Oral Health Measures 11

 The National Quality Forum (NQF)..... 11

 The National Priorities Partnership (NPP) 11

 Healthy People 2020 12

 The AHRQ National Healthcare Quality and Disparities Reports..... 12

 The AHRQ National Quality Measures Clearinghouse (NQMC) 12

 The AHRQ National Guideline Clearinghouse 13

 Consumer Assessment of Healthcare Providers and Systems (CAHPS) Program 13

 The National Committee for Quality Assurance (NCQA)..... 13

 Healthcare Effectiveness Data and Information Set (HEDIS)..... 13

Early and Periodic Screening, Diagnostic, and Treatment (EPSDT)	13
Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA)	14
CMS Data Collection from States	14
CMS Oral Health Strategy	14
The Indian Health Service	15
Military Dental Services	15
The Veterans Administration Oral Health Quality Initiatives	15
The Medicaid/SCHIP Dental Association	15
Other Federal Sources of Oral Health Measures	16
Quality Measurement in the Oral Health Safety Net	16
Oral Health Quality in Large Group Dental Practices	18
HealthPartners	18
American Dental Partners	19
Quality Improvement in the Dental Benefits Industry	19
Quality Improvement Efforts in Organized Dentistry	20
Hospital Dental Department Quality Improvement Efforts	20
Dental Practice-Based Research Networks	21
Oral Health Quality Systems Lag Behind those in Medicine	21
Future Trends in Oral Health Quality Measurement and Improvement	23
Electronic Health Records	23
Diagnostic Codes	23
Dental Benefits Industry Quality Improvement Activities	23
Integration of oral and general health activities	24
Health Disparities and Oral Health	24
Moving Oral Health Payment from Volume to Value	25
New Oral Health Delivery Systems	25
Conclusions	26
References	28

Quality is a direct experience
independent of and prior to
intellectual abstractions. The place
to improve the world is first in one's
own heart and head and hands, and
then work outward from there.

— ROBERT PIRSIG

Zen and the Art of Motorcycle Maintenance:
An Inquiry Into Values.¹

INTRODUCTION

The U.S. healthcare system is undergoing profound changes and has now entered the “Era of Accountability.”

This is evident in the decade-long journey from “pay-for-performance” experiments to “Accountable Care Organizations” established in the Affordable Care Act (ACA), and the current call for “Value-Based Care.”^{2,3,4,5,6,7,8,9,10} A 2010 Urban Institute report on *Moving Payment from Volume to Value* highlighted the need to align payment incentives with health care outcomes and value for patients, a persistent theme in health reform.¹¹ Donald Berwick, former Administrator of the Centers for Medicare & Medicaid Services (CMS) and former President and Chief Executive Officer of the Institute for Healthcare Improvement has referred to the goals of this journey as the “Triple Aim.”¹² The three aims are improving the experience of care, improving the health of populations, and reducing per capita costs of health care.

The drivers of this journey include:

1. the skyrocketing cost of health care unrelated to improvement in health outcomes,
2. increasing understanding of the harm and unwarranted variability our fragmented health care system produces,
3. evidence of the profound health disparities that still exist in the population in spite of scientific advances in care, and
4. increasing awareness of these problems in the age of consumer empowerment.

There is evidence that as a nation we spend much more of our gross domestic product on health care than the rest of the developed world and have poorer health outcomes.^{13,14,15,16} In addition the 1999 and 2001 Institute of Medicine (IOM) reports, *To Err Is Human: Building a Safer Health System* and *Crossing the Quality Chasm*, highlighted the problems with the U.S. healthcare system in the areas of patient safety, inefficient use of resources, fragmentation of the delivery system, and the need to re-design the way health care is delivered.^{17,18} Finally there is wide evidence that our health care system produces profound inequities in the delivery of care and in health outcomes, with certain populations being less able to

access health care services and having significantly poorer health than other segments of the population.^{19,20}

The oral health delivery system mirrors many of the problems described above, yet has less well developed systems for measuring and improving quality. A 2009 review of the Challenges in Quality Assessment in Dental Care concluded that “Quality assessment in dental care is in a relatively primitive state, and the measures used for such assessments are little changed in the past three decades. The dental profession’s ability to assess the quality of care provided by nontraditional or alternative providers and delivery systems, as well as its ability to compare the quality of this care with that provided by traditional providers and systems, is limited.”²¹

The drivers to improve quality and reduce cost of providing oral health care for the nation parallel those in the general health care system. The total national expenditures for oral health care are expected to double between 2005 and 2020.²² In addition dental care is among the largest out-of-pocket health expenditures in the U.S., second only to prescription drugs.²³ Variability in results and health disparities are also major issues in oral health. The 2000 Report of the Surgeon General, *Oral Health in America*, stated that “Despite improvements in oral health status, profound disparities remain in some population groups as classified by sex, income, age, and race/ethnicity. For some diseases and conditions, the magnitude of the differences in oral health status among population groups is striking.”²⁴ In 2011 the Institute of Medicine and the National Research Council of the National Academies of Science issued two reports on oral health, *Advancing Oral Health in America* and *Improving Access to Oral Health Care for Vulnerable and Underserved Populations*.^{25,26} Both of these reports describe the significant proportion of the U.S. population that do not have access to oral health services and the disparities in oral health among these groups. They also both address the need for improved measurement of the results of oral health activities and for the development of systems to improve quality and accessibility of oral health services.

There are a number of efforts now underway to improve measurement of oral health outcomes and drive the oral health system toward improved quality at lower cost that will inevitably bring the oral health care delivery system into the “Era of Accountability.” It is predictable that these efforts will have a major impact on the way that dental care is organized and delivered in the future.

The purpose of this report is to review the current status and trends in quality measurement and improvement and describe efforts underway to expand and enhance those efforts. The report will also describe opportunities to use emerging oral health measurement and quality improvement systems to improve and maintain the oral health of the U.S. population.

WHAT IS QUALITY IN HEALTH CARE?

Definitions of Quality

There are many, and sometimes conflicting definitions of quality and quality-related activities. In 1990, the Institute of Medicine defined quality in health care as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”²⁷ Earlier, in 1980, Donabedian had suggested that quality can be evaluated based on structure, process, and outcomes where structural quality evaluates health system capacities, process quality assesses interactions between clinicians and patients, and outcomes offer evidence about changes in patients’ health status.^{28,29} The best process measures are those where there is evidence that the process under consideration leads to better outcomes. And the best outcome measures are those where there is evidence that the outcome can be improved by the health care system.¹⁸

The National Quality Forum (NQF) has refined Donabedian’s categories of quality measurement by describing measures as structural, which reflect the conditions under which providers provide care; process, which describe whether steps proven to benefit patients are followed correctly; intermediate outcomes, which describe outcomes that are steps on the way to the final desired measures of health outcomes; patient experience measures which record patients’ perspectives on their care; and composite measures which combine the result of multiple performance measures to provide a more comprehensive picture of quality care.³⁰

There are many types of activities related to measuring and improving quality and there are somewhat conflicting definitions that have been published of these activities.^{18,31} For the purposes of this report *Quality Measurement* (QM) will refer to collection of data about structure, process, or outcomes of health care activities. While not an end in

itself, data can subsequently be used for a variety of purposes. In some cases simply making data available to those involved in or concerned with a health care delivery system can foster activity among individuals or organizations and subsequent improvement in processes or outcomes.³² In other situations collecting data is the first step in an informal or formal process to foster improvement.

Quality Assurance vs. Quality Improvement

Quality Assurance (QA) programs use data to compare results from health care activities against a pre-defined set of standards or quality indicators. The aim of QA is to bring those activities in line with those standards.¹⁸ *Quality Improvement* (QI) is a cyclical set of activities designed to make continuous improvement in health care structure, process or outcomes. These activities have been referred to as programs of Continuous Quality Improvement (CQI) or Total Quality Management (TQM). The cycle progresses through a set of steps that involves setting goals, collecting data, analyzing results, and then setting new goals. Dr. W. Edwards Deming labeled these steps as “Plan, Do, Study, Act”.^{33,34} His concept is often abbreviated as the PDSA cycle.³⁵

Six Aims for Quality Improvement

The Institute of Medicine has defined six key aims for improvement in the quality of our health care system.¹⁸ They state that health care should be:

- Safe - avoiding injuries to patients from the care that is intended to help them.
- Effective — providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively).
- Patient-centered — providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.
- Timely — reducing waits and sometimes harmful delays for both those who receive and those who give care.
- Efficient — avoiding waste, including waste of equipment, supplies, ideas, and energy.

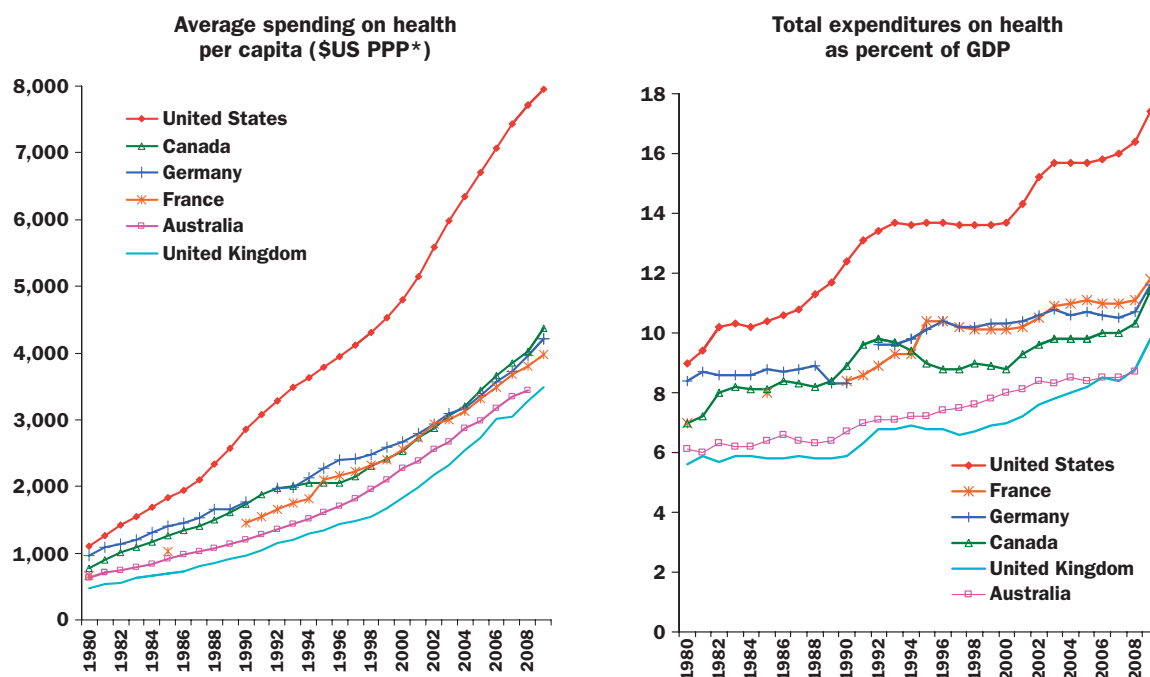
- Equitable — providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

DRIVERS OF QUALITY IMPROVEMENT IN THE U.S. HEALTH CARE SYSTEM

The Skyrocketing Cost of Health Care

Michael Porter, a Professor at the Harvard School of Business and a leading authority on competition, business strategy and international competitiveness, has written extensively about “Value in Health Care.”^{2,8,9} He points out, as have many others, that the U.S. health care system spends significantly more money per capita as a percent of our gross domestic product (GDP) than other developed nations.^{13,14,15,16} In fact, as illustrated in Figure 1, the U.S. share of GDP was over 17% in 2009, while the rest of the developed world spent single digit percentages of their GDP on health.^{16,36} However, in spite of this level of spending, U.S. consumers rate their care worst among these nations and the U.S. trails most of the rest of the developed world on many health indicators.^{17,18,37} Porter argues that this situation has arisen, in part, because the U.S. health care system does not operate using market forces present in other industries. Our health care system has evolved to a zero-sum competition in which costs are shifted among participants and incentives are not aligned with producing the best value for the consumer. He asserts that the way to transform health care is to realign competition with value for patients where value is the health outcome per dollar cost expended based on health conditions over the full cycle of care.⁹

International Comparison of Spending on Health, 1980-2009



*PPP=Purchasing Power Parity.

Data: OECD Health Data 2011 (database), Version 6/2011.

Source: Commonwealth Fund National Scorecard on U.S. Health System Performance, 2011.

Figure 1: International Comparisons of Spending on Health¹⁶

The Urban Institute has also argued for a fundamental shift from “paying for volume” to “paying for value.” Their report on *Moving Payment from Volume to Value: What Role for Performance Measurement* explores a number of options for organizing incentive systems to drive providers and organizations to maximize the value output from their health care activities.¹¹

The idea of focusing on and aligning incentives with outcomes at various levels is not new. Pay-for-performance (P4P) systems have been growing in health care since the 1990s.² A P4P system is a payment system arrangement in which a portion of the payments is based on performance assessed against a defined measure. Early systems were hampered by inconsistent performance measures, difficulty with public reporting, insufficient sample sizes, and minimal funding.⁵ However, as experience has grown pay-for-performance is being considered or incorporated into greater numbers of health care systems.

It is important to realize that P4P systems, as with all incentive systems, risk introducing unintended results that can be influenced by the way performance is measured and care is paid for. A 2010 review of current P4P activities notes that “fee-for-service incentivizes overuse, managed care incentivizes underuse, and somehow each perversely contribute to misuse.”⁶ It is critical, therefore that P4P systems carefully consider payment incentives as well as performance measures if they are to drive providers toward better quality at lower cost.

Unwarranted Variations in Care Costs and Health Outcomes

It has long been recognized that there are significant variations in costs of health care in the U.S. unrelated to the complexity of the population served or the quality of health outcomes achieved. The Dartmouth Atlas project has demonstrated this phenomenon with a decade of data on health costs and outcomes.³⁸ In a New Yorker essay called *The Cost Conundrum* in 2009, Atul Gawande, physician and journalist at Brigham and Women’s Hospital in Boston, analyzes these disparities.³⁹ He concludes that

there are many areas in the country where fragmentation of the health care system has led to competition for profits among components of the system to the exclusion of improved quality and lower costs for the system as a whole. This is important because, as Clayton Christensen, Professor of Business at Harvard argues, it is difficult to improve quality and lower cost through innovation in the presence of a fragmented health care delivery system.⁴⁰ For example, in a system where hospitals get paid when people are hospitalized, hospital administrators will not celebrate and perhaps not even support innovations that keep people from needing to be hospitalized through better ambulatory care. However, in a system where ambulatory care and hospitals are integrated into a network that benefits as a whole when quality is improved and costs are reduced, then real innovation is possible and celebrated.

Health Disparities Among Populations

It has also long been recognized that there are significant variations in the quality and outcomes of care received by populations in various ethnic and racial minority populations. In 2002, the Agency for Healthcare Research and Quality (AHRQ) documented variations in care delivered unrelated to payor source or other variables.^{19,20} For example, the AHRQ report cited a study that showed that, although the use of thrombolysis for patients who had experienced a heart attack was well established among Medicare recipients, this evidence-based life-saving treatment was underused for all patients. However, they reported that black Medicare beneficiaries were significantly less likely than whites to receive this treatment. The IOM, in the 2003 report, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, clearly demonstrated that racial and ethnic minorities tend to receive lower quality health care than non-minorities, even when access-related factors, such as patients' insurance status and income, are controlled.⁴¹ They concluded that the sources of these disparities are complex, are rooted in historic and contemporary inequities, and involve many participants at several levels, including health systems, their administrative and bureaucratic processes, utilization managers, healthcare professionals, and patients. They also concluded that there was evidence that stereotyping, biases, and uncertainty on the part of healthcare providers can all contribute to unequal treatment.

IMPROVING HEALTH THROUGH MEASUREMENT AND QUALITY IMPROVEMENT SYSTEMS

Measurement and Health Disparities

It has long been recognized that measurement is a critical component of quality improvement.^{28,29,30} In 2008 the National Quality Forum (NQF) issue brief, *Closing the Disparities Gap in Healthcare Quality with Performance Measurement and Public Reporting*, called for using performance measures and public reporting as methods to close disparities gaps in health care access and outcomes.⁴² However the report acknowledges that there is little empirical data to determine if public reporting will have the desired effect. Nevertheless, the AHRQ now produces annual National Healthcare Quality & Disparities Reports.⁴³ The NQF Issue Brief cites many other efforts underway to collect and report on additional data. Also in 2008, NQF issued a report, *National Voluntary Consensus Standards for Ambulatory Care: Measuring Healthcare Disparities* which calls for development and use of "disparities sensitive" measures.⁴⁴ Thirty-five such measures are described in the report.

In April 2009, the Institute of Medicine released a report, *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement*, which emphasizes that inadequate data on race, ethnicity, and language lowers the likelihood of effective actions to address health disparities.⁴⁵ This report offers an approach to identifying racial, ethnic, and language categories that bear on disparities in health care and health outcomes with the expectation that this standardized approach to classification will both help measure progress in eliminating disparities and assure that comparisons across different settings are based on similar groupings of individuals.

In April 2011, the U.S. Department of Health and Human Services (HHS) released the *HHS Action Plan to Reduce Racial and Ethnic Health Disparities: A Nation Free of Disparities in Health and Health Care* ("HHS Disparities Action Plan").⁴⁶ This plan includes goals and strategies to measure and reduce health disparities and complements the 2011 *National Stakeholder Strategy for Achieving Health Equity*, a product of the National Partnership for Action ("NPA Stakeholder Strategy").⁴⁷ That document incorporates ideas, suggestions and comments from thousands

of individuals and organizations across the country. It is designed so local groups can decide which goals are most important for their communities and adopt the most effective strategies and action steps to help reach them.

In October 2011, a Health Affairs Health Policy Brief on *Achieving Equity in Health* again reviewed data showing that racial and ethnic minorities, those with limited education or income and people with disabilities have worse health and health care compared to those who are not members of these groups or are better educated or financially better off.⁴⁸ One of many examples cited was the fact that, according to the National Center for Health Statistics, the age-adjusted death rate for blacks has been sharply higher than for whites for decades and was almost 29 percent higher in 2007. The report describes determinants of health including: economics, education; geography and neighborhood; environment; stress; lower quality care; inadequate access to care; inability to navigate the system; provider ignorance or bias; and other communication difficulties. The report also describes successes in reducing disparities based on specific measurement of health care and health outcomes and targeted activities to improve results.

Also recently, the Agency for Healthcare Research and Quality (AHRQ) has developed a proposed set of criteria for the Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA) Pediatric Quality Measurement Program (PQMP), described later in this document. These criteria could require entities proposing measures to describe how those measures would identify variation in performance based on race and ethnicity, special health care needs, or socioeconomic status.⁴⁹

Pay-for Performance and Accountable Health Care

Discussion of, and experimentation with, Pay-for-Performance (P4P) systems have taken place over the last several decades.^{4,5,6} The goal of these systems had been to align provider incentives with value for patients and improve health outcomes while lowering costs. With the adoption of the Affordable Care Act (ACA) the United States began to fund and collect data about Accountable Care Organizations (ACOs).¹⁰ The ACA calls for pilot projects to adopt the principles of ACOs in which doctors and hospitals would get paid based on their ability to hold down overall costs and meet quality-of-care indicators.

A story in Kaiser Health News described this system by saying that for both doctors and hospitals "their pay would be based on improving care, not driving more of it. In effect the ACOs are an attempt to build integrated health systems like the Mayo Clinic where none exist."⁵⁰

The Quality Movement

The need for major change in the U.S. healthcare system was highlighted by the 1999 and 2001 Institute of Medicine (IOM) reports, *To Err Is Human: Building a Safer Health System* and *Crossing the Quality Chasm*.^{17,18} These reports highlighted the problems with the U.S. healthcare system in the areas of patient safety, inefficient use of resources, fragmentation of the delivery system, and the need to re-design the way health care is delivered. They highlight the large cost of medical errors and the inefficient use of resources in our fragmented system. In *Crossing the Quality Chasm* the IOM called for a national strategy to transform the health care system.¹⁸ The report recommends six aims for creating a health care system which is "Safe; Effective; Patient Centered; Timely; Efficient; and Equitable."

Ten years after the IOM call for a national strategy, the U.S. Department of Health and Human Services (HHS), as mandated in the ACA, has produced a *National Strategy for Quality Improvement in Health Care*.⁵¹ The strategy seeks to accomplish three broad aims:

- **Better Care:** Improve the overall quality, by making health care more patient-centered, reliable, accessible, and safe.
- **Healthy People/Healthy Communities:** Improve the health of the U.S. population by supporting proven interventions to address behavioral, social and, environmental determinants of health in addition to delivering higher-quality care.
- **Affordable Care:** Reduce the cost of quality health care for individuals, families, employers, and government.

The National Strategy is supported by a set of ten principles developed by a broad stakeholder process. These principles will be updated annually.⁵²

In addition to the U.S. national strategy, quality and accountability activities are taking place at many levels of government and the private sector. The Robert Wood Johnson Foundation (RWJF) noted in its 2008 report,

The State of Health Care Quality in America, that the U.S. health care system, the most expensive health care system in the world, consistently underperforms relative to other countries and has been found to be at or near the bottom of the list on most dimensions of quality, from safety, to coordination of care, to the degree to which the system focuses on patients’ interests.⁵³ As a result RWJF has developed a national strategy called *Aligning Forces for Quality* that “enlists doctors, nurses, hospitals, patients, consumer groups, employers, health plans and other health professionals to work together to improve quality in ways that transform health care for patients from all racial and ethnic backgrounds.”⁵⁴ The RWJF has also supported the *Multi-State Learning Collaborative: Lead States in Public Health Quality Improvement* (MLC).⁵⁵ MLC brings state and local health departments in 16 states together with other stakeholders including public health institutes, healthcare providers, and universities to prepare for national voluntary accreditation and implementation of quality-improvement practices.

Since 1999, a number of government and private funders have helped to create and support the National Quality Forum (NQF).⁵⁶ NQF is a non-profit organization that operates under a three-part mission to improve the quality of American healthcare by building consensus on national priorities and goals for performance improvement and working in partnership to achieve them; endorsing national consensus standards for measuring and publicly reporting on performance; and promoting the attainment of national goals through education and outreach programs. In 2009, the U.S. Department of Health and Human Services (DHHS) awarded a contract to NQF to help establish a portfolio of quality and efficiency measures that will allow the federal government to more clearly see how and whether healthcare spending is achieving the best results for patients and taxpayers. NQF has developed a rigorous process for endorsing performance measures.⁵⁷ The criteria used to evaluate proposed measures include the importance of measurement and reporting for a given measure, the scientific acceptability (reliability and validity) of the measure’s properties, and the usability and feasibility of the measure. NQF has endorsed almost 700 standards for measurement, preferred practices and measurement frameworks. These endorsed standards are available in an on-line searchable database.⁵⁸

NQF has also produced a primer on quality measurement called the *ABCs of Measurement*.⁵⁹ The *ABCs of Measurement* web page contains the downloadable primer on measurement as well as a video link to a 2010 Webinar sponsored by NQF in which, Michael Dowling, President and CEO of North Shore LIJ Health Systems described the evolution of U.S. health care system.⁶⁰ As summarized in Figure 2, the U.S. health care system has been provider centric, value blind, episodic and fragmented, inpatient focused, based on individual outcomes, and directed at treatment of disease. He describes a changing system that is moving to being patient centric, value based, continuous and coordinated, ambulatory and home focused, population based and directed toward health, wellness and prevention.

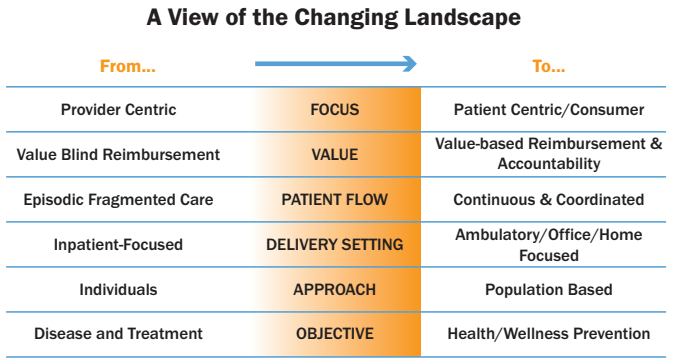


Figure 2: Evolution of the U.S. Health Care System⁶⁰

The Agency for Healthcare Research and Quality also maintains an on-line database of quality measures in the National Quality Measures Clearinghouse.⁶¹ These are grouped into five domains. Four of these, measures of process, access, outcome, and patient experience, assess the quality of care provided by health care professionals and organizations. The fifth, measures of structure, assess the capacity of health care professionals and organizations.

In addition to the primarily public sector activities described above there has been substantial involvement of private sector entities in the quality movement. For example, the Institute for Healthcare Improvement (IHI) was founded in the 1980s and focused initially on identification and spread of best practices.⁶² IHI has now become one of the most influential organizations in the U.S. for the improvement of health care. The 2007 report on Whole System Measures established a balanced portfolio of measures to track all three components of the “Triple Aim” described earlier.⁶³

Another example of private sector entities engaged in and influencing improvement in quality activities is the National Committee for Quality Assurance (NCQA).⁶⁴ NCQA, a private, 501(c)(3) not-for-profit organization dedicated to improving health care quality was founded in 1990 and maintains accreditation, certification and recognition programs. The NCQA seal is described by NCQA as a widely recognized symbol of quality. Organizations incorporating the seal into advertising and marketing materials must first pass a comprehensive review and must annually report on their performance. For consumers and employers, the seal is described by NCQA as an indicator that an organization is well-managed and delivers high quality care and service. NCQA also develops performance measures for health plan, providers and government organizations. NCQA developed and maintains the *Healthcare Effectiveness Data and Information Set* (HEDIS), a tool used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service.⁶⁵

It is evident from the activities mentioned here and many more not mentioned that the U.S. health care system has been on an unsustainable course and that substantial efforts are underway to produce a more accountable system that can deliver better quality care at lower cost.

Quality Improvement and Health Information Technology

Some quality improvement activities are hampered by difficulties in collecting and aggregating data. It has been the goal of several U.S. administrations to establish a National Health Information Infrastructure (NHII).⁶⁶ The goal is to establish access to relevant, reliable information that would greatly improve everyone's ability to address personal and community health concerns. The American Recovery and Reinvestment Act of 2009 (ARRA) amended the Social Security Act and thereby established the Health Information Technology for Economic and Clinical Health (HITECH) Act as a means for the development and implementation of a nationwide interoperable health information system.⁶⁷ Congress and the Administration along with many health care experts believed that this legislation would promote the adoption and use of health information technology (HIT).⁶⁸ Congress also recognized that improvement in health information systems is important for the improvement of the health of populations, quality care, safety, and the

efficiency of health care systems. The HITECH Act established a series of leadership entities, financial incentives, and technical assistance structures to accelerate the spread of electronic health records and to move toward a national system of interoperable health records.

QUALITY IMPROVEMENT AND ORAL HEALTH

Drivers of Oral Health Quality Improvement

The drivers of quality improvement in oral health are the same as those in general health systems. These are:

- **the increasing cost of oral health care,**
- **increasing understanding of the unwarranted variability produced by the oral health care system,**
- **evidence of the profound health disparities that still exist in the population in spite of scientific advances in care, and**
- **increasing awareness of these problems in the age of consumer empowerment.**

Oral Health Care Expenditures

As with general health care, spending on oral health care is rising rapidly. As indicated in Figure 3, the Centers for Medicare and Medicaid Services (CMS) projects that the total national expenditures for dental care will almost triple between 2000 and 2020, going from \$62.0 billion in 2000 to \$167.9 billion in 2020, a 271% increase over 2000 level.²² As also shown in Figure 3, this increase in expenditures is significantly higher than the increase in the Consumer Price Index (CPI), the best measure of inflation as experienced by consumers in their day-to-day living expenses.⁶⁹ In the decade between 2000 and 2010, the CPI rose to 127% of the 2000 level, while oral health spending rose to 165% of the 2000 level.⁷⁰ One component of the CPI is the CPI for Dental Services (CPI-DS). During the same time period, 2000-2010, the CPI-DS rose to 154% of the 2000 level, double the rise in the CPI for all items and higher than the 149% rise in the CPI for all Medical Care.⁷¹

Also, as indicated in Figure 4, dental expenses are among the highest out-of-pocket health expenditures for consumers. In 2008 dental expenditures accounted for \$30.7 billion or 22.2% of total out-of-pocket health expenditures, second only to prescription medications.²³ The cost of oral health care, coupled with the large portion paid out-of-pocket compared to other health services are reflected in the fact that affordability of dental care is the number one reported barrier to access to dental care.⁷² Affordability concerns are most common among uninsured people, but also a concern for people with privately and public insurance.

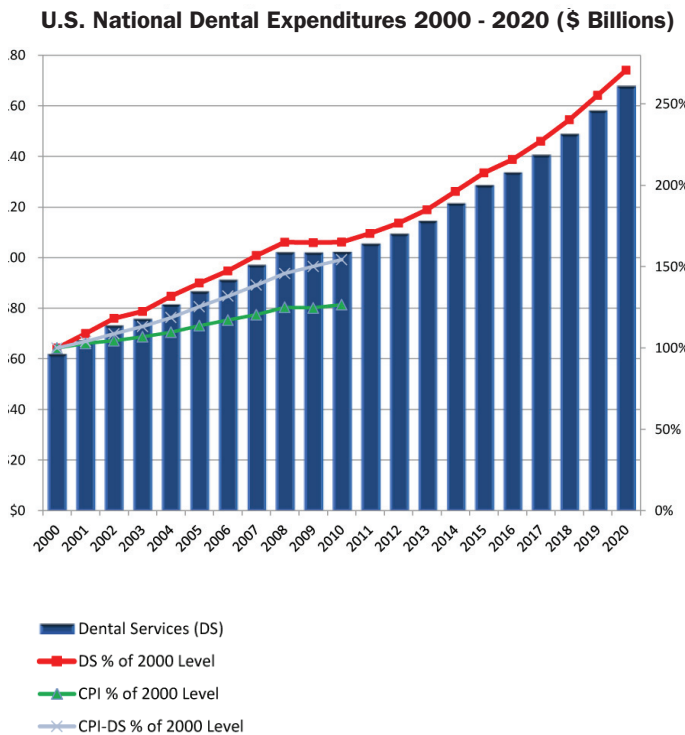
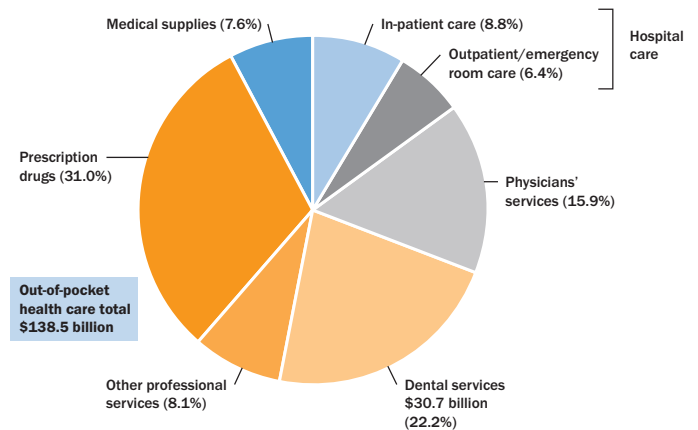


Figure 3: U.S. National Dental Expenditures 2005-2020.^{22,70,71}

Consumer out-of-pocket health care expenditures in 2008



Source: Bureau of Labor Statistics. Consumer out-of-pocket health care expenditures in 2008

Figure 4: Consumer out-of-pocket health care expenditures in 2008.²³

Unwarranted Variability and Outcomes

Bader and others have described the limited evidence that exists for most procedures performed in oral health care.^{21,73} As a result, there are widespread unexplained variations in clinical decisions among dentists.⁷⁴ One study that compared six capitated practices with five fee-for-service practices found that average rates of restorative services were higher in the fee-for-service practices: three times as high for adults and four times as high for children. Even when differences in patients are accounted for, variations in dentists' clinical decisions are still widespread.⁷⁵

Oral Health Disparities

As indicated earlier, the 2000 Report of the Surgeon General, *Oral Health in America*, stated that "Despite improvements in oral health status, profound disparities remain in some population groups as classified by sex, income, age, and race/ethnicity. For some diseases and conditions, the magnitude of the differences in oral health status among population groups is striking."²⁴ The American Dental Association has estimated that around 30% of the population has difficulty accessing dental services through the current private dental care delivery system.⁷⁶ As an example, a 2008 report from the California Health Care Foundation indicated that 24% of all children, ages 0-11, in California had never seen a dentist.⁷⁷ Also, a national analysis in 2010 by the GAO indicated that only about one third of children enrolled in Medicaid received any dental service during the 2008 fiscal year.⁷⁸

These factors described above will drive the oral health system in the same direction that general health is being driven — toward increased measurement of the outcomes of oral health activities, using data to improve quality and lower costs, and moving incentives from *Volume to Value*.

A Hierarchy of Quality Improvement Activities

There is growing sentiment that the oral health care delivery system will be included in the move toward accountability in health care.⁷⁹ However, systems for measuring quality in dental care have been described as being “in a relatively primitive state” with the measures used being little changed in the last three decades.²¹ Since measurement is a key ingredient in any system to improve quality, it follows that quality improvement systems in oral health care are also in a relatively primitive state.

A framework in which to consider quality improvement in oral health care can be represented in terms of a hierarchy of levels of quality improvement activities. For each of these levels there are structure, process and outcomes that can be measured. Figure 5 illustrates this hierarchy.

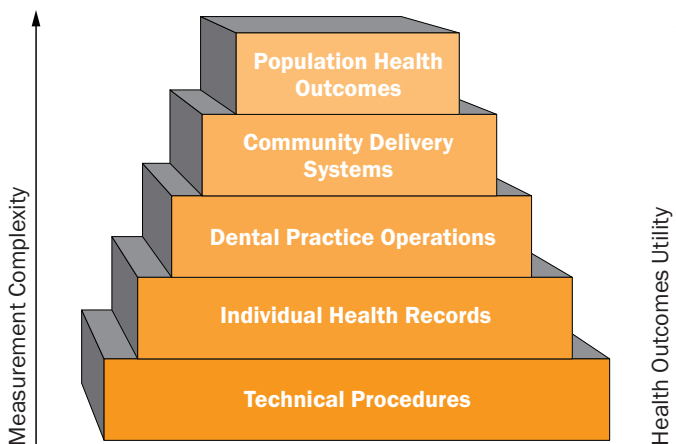


Figure 5: Levels of Quality Improvement Activities

At the lowest level are measurements of the process or results of technical procedures, which are typically the easiest to measure. These are often measured against previously developed criteria. These measurements, however, typically offer the least information about the long term health benefit for the individual or population. Review of individual health records can provide information about health care activities over time. Results are typically directed at

evaluation of services performed for individuals and compared to a set of pre-determined criteria for documentation in the health record. These results are often used in quality assurance programs to determine whether “things are being done right”. However, measurement of whether “things are being done right” does not necessarily yield information about whether “the right things are being done.”

Measures of dental practice operations can also be used to review the structure of a given dental practice, clinic, or group of practices or the processes in place in those practices. There are quite sophisticated assessment systems in place. However, they are most often related to structural, procedural or financial performance as opposed to the health of the population served.

Measures related to populations can include measures of community delivery systems which might be used to assess the total delivery system in a given community. Again these might be measures of structure, process, or outcomes of these systems. Even at this level, these measures are typically focused on the performance of providers as opposed to “patient-centered” approaches focusing on the health of the people being served.

At the top end of this spectrum are systems that attempt to directly examine long term health outcomes for the population. Although systems that evaluate population health outcomes could produce the most useful information for improving overall quality and cost of oral health care delivery, it is more difficult to define appropriate measures at this level and to collect and analyze appropriate data. At present there are few generally agreed upon oral health population health outcomes measures and those that do exist are not used as direct incentives to drive the oral health system to improve.

Later in this report it will be evident that quality measures, assurance, or improvement efforts in the dental profession have primarily focused on the lower levels of this hierarchy, technical procedures and health records and have primarily focused on performance of providers rather than health of the population. However, there are now emerging attempts and opportunities to develop “patient-centered” measures and incorporate higher levels of the hierarchy, ultimately focusing on the health outcomes of the populations being served and the cost of doing so.

QUALITY IMPROVEMENT ACTIVITIES IN ORAL HEALTH

Sectors of the Oral Health Industry

We can examine current activities in oral health quality improvement by categorizing those activities by sectors of the oral health industry. This report will review quality improvement activities in the following areas:

- Federal or National Agencies and Programs
- The Oral Health Safety-Net
- Large Group Dental Practices
- The Dental Benefits Industry
- Professional Dental Associations
- Hospital-based Dental Practices
- Dental Practice-based Research Networks

Federal or National Oral Health Measures

A number of government and national non-profit organizations have adopted or are developing or suggesting oral health measures as a part of quality improvement efforts.

The National Quality Forum (NQF)

As indicated earlier, the National Quality Forum (NQF) is a non-profit organization that operates under a three-part mission to improve the quality of American healthcare by building consensus on national priorities and goals for performance improvement and working in partnership to achieve them; endorsing national consensus standards for measuring and publicly reporting on performance; and promoting the attainment of national goals through education and outreach programs.⁵⁶ In November 2009, the NQF convened a Child Health Outcomes Steering Committee to identify, evaluate, and endorse measures suitable for public reporting and quality improvement that specifically address child health outcomes.⁸⁰ The Child Health Outcomes Project included both cross-cutting and condition-specific outcome measures. The project also identified gaps in existing outcome measures. Out of the 44 endorsed measures there are 4 oral health measures included in the initial release of these measures.⁸¹ They are:

- children who received preventive dental care as measured by how many children in a target population received preventive dental visits during the previous 12 months;
- children who have dental decay or cavities as measured by documentation of children age 1-17 years who have had tooth decay or cavities in the past 6 months;
- children who receive an annual dental visit as measured by the percentage of members 2-21 years of age who had at least one dental visit during the measurement year; and
- primary caries prevention intervention as part of well/ill child care as offered by primary care medical providers as measured by the extent to which primary care providers apply fluoride varnish.

The National Priorities Partnership (NPP)

In 2010, the Affordable Care Act (ACA) charged the Department of Health and Human Services (HHS) with developing a National Quality Strategy to improve the nation's ability to provide all Americans with access to healthcare that is safe, effective, and affordable.² In a March 2011 report to Congress HHS released the *National Strategy for Quality Improvement in Health Care*.⁸² The report described a number of priorities for developing better care, healthier communities and affordable care. Although oral health was not addressed in the report, HHS released the report with a request for input to make the strategy measurable and actionable through ongoing development of specific goals, measures, benchmarks, and initiatives. In order to provide input on the original report and subsequent modifications the NQF formed a multi-stakeholder National Priorities Partnership (NPP), a partnership of 48 public- and private-sector partners. In September 2011 the NPP released a report, *Input to the Secretary of Health and Human Services on Priorities for the National Quality Strategy*.⁸³ The report recommends using three oral health measures under the section on "Work with communities to promote wide use of best practices to enable healthy living and well-being." The proposed oral health measures are from *Healthy People 2020* and are:

- the proportion of young children aged 3 to 5 years with dental caries experience in their primary teeth,
- the proportion of adults with untreated dental decay, and

- the proportion of children, adolescents, and adults who used the oral healthcare system in the past year.

Healthy People 2020

Healthy People is the set of national health objectives published by the U.S. Department of Health and Human Services (HHS) each decade.⁸⁴ These objectives, with 10-year targets, are designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States. The current set of objectives, *Healthy People 2020*, is divided into 42 topic areas including a section on oral health containing 17 objectives.⁸⁵ Each oral health objective contains a general target area with a number of specific sub-objectives. This represents a total of 26 specific sub-objectives, each of which has a specific measure, an identified source of data, and a 10 year target for improvement for that measure. For example the first oral health objective, OH-1 is “Reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth.” Sub-objective OH-1.1 is “Reduce the proportion of young children aged 3 to 5 years with dental caries experience in their primary teeth.” The baseline is identified as “33.3 percent of children aged 3 to 5 years had dental caries experience in at least one primary tooth in 1999–2004.” The 10 year target is a 10 percent improvement to reach a goal of 30 percent. The identified data sources include the National Health and Nutrition Examination Survey (NHANES).

In 2011, HHS designated a subset of the *Healthy People 2020* goals as *Leading Health Indicators*.⁸⁶ There is one oral health goal included in the list. That is objective OH-7, “Increase the proportion of children, adolescents, and adults who used the oral health care system in the past 12 months.”⁸⁷

The AHRQ National Healthcare Quality and Disparities Reports

As described above, the AHRQ produces annual National Healthcare Quality & Disparities Reports.⁴³ The 2010 report, *National Healthcare Disparities*, mentions oral health in the context of data on people who have difficulty obtaining or affording health care services and on the adequacy of the dental workforce.⁸⁸ There is also some specific data presented on the impact of diversity on access to dental services or ability to have good oral health. For

example the report notes that Blacks and Hispanics fared worse than Whites in the most recent year and in trends over time for children age 2-17 who had a dental visit in the calendar year. It also notes that, on a measure of people who were unable to get or delayed in getting needed dental care in the last 12 months, adults with basic activity limitations had fared worse than adults with neither basic nor complex activity limitations for most recent year and their trends over time. Finally there are data tables that list measures such as people who had a dental visit in the calendar year and present the data by race, age, gender, family income, activity limitations and other factors.

The AHRQ National Quality Measures Clearinghouse (NQMC)

The AHRQ National Quality Measures Clearinghouse (NQMC) database includes oral health quality measures that meet NQMC criteria. Similar to the NQF criteria described above, the NQMC criteria include verification of the measure’s importance, documented reliability and validity, evidence of feasibility, and evidence that it addresses an aspect of health care delivery or population health.⁸⁹ The search page includes dental measures under the topic of “Head, Eyes, Ears, Nose and Throat,” subtopic “Dental.”⁹⁰ There are 28 measures listed under that subtopic that meet the NQMC criteria. The measures range from process measures like number or percent of children and adults with dental visits, sealant placement, or oral cancer examination in a year to health outcome measures such as the number or percent of children or adults with caries experience, untreated caries or periodontal disease. Of the 28 measures, 26 are described as being used for reports or surveillance data, but not tied to any specific quality improvement effort. Only two, both developed and used by HRSA are described as being used for quality improvement and program measurement. These are:

- the percent of patients with a comprehensive oral exam and treatment plan completed within a 12 month period among all patients greater than or equal to 18 years of age in the target population of the grant project
- the percent of third grade children who have received protective sealants on at least one permanent molar tooth among all third grade children in State during the year.

The AHRQ National Guideline Clearinghouse

Another AHRQ database related to quality measurement is the AHRQ National Guideline Clearinghouse, an on-line database of clinical care guidelines produced by relevant professional societies, public or private organizations, government agencies at the Federal, State, or local level; or health care organizations or plans.⁹¹ Guidelines must meet standards developed by AHRQ demonstrating that they are evidence- or consensus-based. While these are not quality measures, they can in some cases be used as “standards of care” and therefore might prove useful in quality improvement systems. There are 140 guidelines that meet the search criterion “dentistry” and 221 that meet the search criterion “dental”.

Consumer Assessment of Healthcare Providers and Systems (CAHPS) Program

The AHRQ also maintains the *Consumer Assessment of Healthcare Providers and Systems* (CAHPS) program.⁹² CAHPS is public-private initiative to develop standardized surveys of patients’ experiences with ambulatory and facility-level care. Health care organizations, public and private purchasers, consumers, and researchers use CAHPS results to assess the patient-centeredness of care and compare and report on performance; and improve quality of care. CAHPS develops and supports the use of a comprehensive and evolving family of standardized surveys that ask consumers and patients to report on and evaluate their experiences with health care. In 2009 a CAHPS Dental Plan Survey was developed and tested and approved by the CAHPS dental plan consortium.^{93,94} It contains 28 substantive items, 3 eligibility items, and 8 “About You” items. The CAHPS Dental Plan Survey is available and in use by a number of dental plans.

The National Committee for Quality Assurance (NCQA)

Another national organization engaged in health care quality activities is the National Committee for Quality Assurance (NCQA).⁶⁴ As indicated above, NCQA was founded in 1990 and maintains accreditation, certification and recognition programs. NCQA develops and maintains the *Healthcare Effectiveness Data and Information Set* (HEDIS) which is widely recognized and incorporated in quality improvement systems by health plans and other funders.⁶⁵ HEDIS contains one recognized oral health measure.

Healthcare Effectiveness Data and Information Set (HEDIS)

The HEDIS set of measures is used by more than 90 percent of America’s health plans to measure performance on important dimensions of care and service.⁶⁵ Because so many plans collect HEDIS data, and because the measures are so specifically defined, HEDIS makes it possible to compare the performance of health plans. Health plans also use HEDIS results themselves to see where they need to focus their improvement efforts. There is one dental measure in HEDIS. It is used with Medicaid plans, but not commercial plans. The measure is:

- the percentage of recipients 2-21 years of age who had at least one dental visit during the measurement year. The eligible population has to have continuous enrollment during the measurement year, with no more than one gap in enrollment of up to 45 days.

Early and Periodic Screening, Diagnostic, and Treatment (EPSDT)

The Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) service is Medicaid’s comprehensive and preventive child health program for individuals under the age of 21.⁹⁵ EPSDT was defined by law as part of the Omnibus Budget Reconciliation Act of 1989 (OBRA ‘89) legislation and includes periodic screening, vision, dental, and hearing services. States are required under EPSDT to provide at a minimum relief of pain and infections, restoration of teeth and maintenance of dental health. A full description of the oral health aspects of the EPSDT program is available from CMS.⁹⁶

States are required to report their performance to CMS using the EPSDT Report, (Form CMS-416). As of 2011, the form contains seven dental related measures. The measures are based on total individuals eligible for EPSDT receiving:

- any dental services by or under the supervision of a dentist,
- preventive dental services,
- dental treatment services,
- a sealant on a permanent molar tooth,
- diagnostic dental services,

- oral health services provided by a non-dentist provider, and
- any dental or oral health service by or under the supervision of a dentist or an oral health service by a non-dentist.

Definitions of these measures and instructions are available in a document describing the CMS 416 Instructions as of 06/2011.⁹⁷

Although the EPSDT reporting process does collect data on the measures listed above, a report by the Government Accounting Office indicated that this process is insufficient to oversee the provision of dental services in state Medicaid programs.⁹⁸ There are multiple concerns. One significant concern is that data are only collected for children receiving dental services, which does not allow analysis of factors such as the inability of beneficiaries to find dentists to treat them which contribute to low use of dental services among Medicaid children.

Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA)

Another national activity that involves oral health quality measures is the CHIPRA Pediatric Quality Measures Program (PQMP). The Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA) required the Secretary of the Department of Health and Human Services to identify an initial core set of recommended pediatric quality measures for voluntary use by State Medicaid and Children's Health Insurance Program (CHIP) programs and to create a Pediatric Quality Measures Program (PQMP) and regularly update the child health care quality measures.⁹⁹ CMS collaborated with AHRQ and in December of 2009 released 24 initial voluntary measures for states for public comment along with a technical specifications manual.¹⁰⁰ States will be required to report on an amended version of these measures beginning in 2014. The CHIPRA initial measures include 2 measures on oral health. The denominator for both measures is the total number of children, age 1-20, eligible for Medicaid or CHIP for at least 90 continuous days. The oral health measures are:

- the total number of children who received preventive dental services, and
- the total number of children who received dental

treatment services by or under the supervision of a dentist.

The CHIPRA legislation also called for the Institute of Medicine (IOM) to produce a report on efforts to measure child health status and the quality of health care for children across the pediatric age span. The 2011 IOM report, *Child and Adolescent Health and Health Care Quality: Measuring What Matters*, concluded that the patchwork of clinical information systems, periodic sample surveys, registries, and vital and health statistics reported by state and federal agencies does not facilitate the determination of reliable and valid indicators of either health status or health care access and quality for the nation's youth as a whole.¹⁰¹ The report recommended a stepwise process approach to improving data sources and measures of health and health care quality that includes setting shared national goals, developing annual reports and standardized measures, creating new measures and data sources in priority areas, improving methods for data collection, reporting, and analysis, and improving public and private capacities to use and report data. The report specifically identifies the paucity of measures in use on oral health and recommends that the Secretary of HHS develop new measures of health and health care quality focused on preventive services with a life-course perspective and that these measures should focus on common health conditions for children and adolescents, especially in the areas of oral health and mental and behavioral health, including substance abuse.

CMS Data Collection from States

Since 1972 CMS has required states to submit annually aggregated Medicaid data on the CMS-2082 form (Statistical Report on Medical Care: Eligibles, Recipients and Services). Beginning in 1984, CMS allowed states the option of reporting this information electronically, and such submission has been required since 1999. This system, the Medicaid Statistical Information System (MSIS), contains detailed information on Medicaid eligibles, recipients, services received and expenditures.¹⁰² This system can collect information on dental procedures as well as other health services and will presumably facilitate analysis of dental activity.¹⁰³

CMS Oral Health Strategy

In addition to supporting the CHIPRA Pediatric Quality Measures Program (PQMP), CMS has also developed a

CMS Oral Health Strategy, intended as a guide for CMS and states to improve access to oral health services for children enrolled in Medicaid and CHIP.¹⁰⁴ This strategy is part of the *HHS Action Plan to Reduce Racial and Ethnic Health Disparities* described earlier.⁴⁶ The strategy involves working with states to develop state-specific action plans to make progress toward national goals. CMS has announced two national oral health goals:

- increase the rate of children ages 1-20 enrolled in Medicaid or CHIP who receive any preventive dental service by 10 percentage points over a 5-year period, and
- increase the rate of children ages 6-9 enrolled in Medicaid or CHIP who receive a dental sealant on a permanent molar tooth by 10 percentage points over a 5-year period (this goal will be phased in during year 2 or 3 of the initiative).

Both of these goals are related to the national Healthy People 2020 goals, but in this case these two goals are targeted to state-specific improvement in care for children enrolled in Medicaid and CHIP.

CMS will foster progress toward these goals by working with states to develop oral health action plans; strengthening technical assistance to States and Tribes; improving outreach to providers; developing outreach to beneficiaries; and partnering with other governmental agencies.

The Indian Health Service

One of the longest-standing programs that has attempted to measure oral health quality is the Indian Health Service (IHS). Quality assessment (QA) in the IHS dental program began in the late 1960s with the development of criteria to assess technical quality of dental care. There have been a number of revisions since then, including the development of measures to assess management and community components of dental programs; the indirect evaluation of dental care via chart audit; and the evaluation of dental disease prevention activities, infection control procedures, and radiologic health and safety. Current quality assessment measures address the technical quality of dental care, dental program management, community involvement, and indirect methods of assessing clinical quality.¹⁰⁵

Military Dental Services

The U.S. military is also engaged in quality improvement

activities in the military branch dental services. For example, the US Air Force Dental Services (AFDS) has been collecting Dental Population Health Metrics (DPHM) during the mandated annual or periodic dental examination of all patients at U.S. Air Force dental treatment facilities since 1999.¹⁰⁶ These metrics include measures of periodontal health, tobacco use, and caries risk. Through the use of incentives tied to individual risk and individualized “risk-based” interventions, they have been able to significantly reduce caries risk among Air Force personnel enrolled in a risk reduction protocol.

The Veterans Administration Oral Health Quality Initiatives

The Office of Dentistry (OOD) in the U.S. Department of Veterans Affairs (VA) oversees dental care for 380,000 veterans across 207 dental clinics as of 2008. The OOD has three national programs whose shared mission is to improve oral health for veterans. The VA Dental Practice-Based Research Network (PBRN) performs research and shares expertise in a real-world clinical practice. The VA OOD Education Group translates evidence-based research into accessible formats for efficient implementation into clinical practice. The VA OOD Oral Health Quality Group develops quality monitors, study outcomes, and publishes clinical guidelines and Information Papers in an effort to shape clinical behavior in the field to ensure appropriateness and proper scope of care. The Oral Health Quality group has developed and monitors measures including monitoring the number of patients who have had two or more restorations within a 12 month period and looks at whether or not they have received a fluoride treatment or prescription during that time. Other measures monitor waiting times for appointments and frequency of certain types of appointments. The VA is aided in these monitoring efforts by a well developed electronic health record (EHR) system.

The Medicaid/SCHIP Dental Association

The Medicaid/SCHIP Dental Association (MSDA) is an association of state officials who manage Medicaid and CHIP dental programs. MSDA has a Data Committee that is currently reviewing existing dental program quality/performance measures and considering the development of new ones. A few states, e.g., California and Rhode Island, have developed such measures. California’s CHIP program,

for example, used a consensus development process several years ago to establish eight measures that have been used to evaluate the quality of its dental managed care plans for the past three years.^{107,108}

Other Federal Sources of Oral Health Measures

There are many federal surveys, databases and sources of data that contain oral health measures that are not specifically described in this review. One of these is the National Health and Nutrition Examination Survey (NHANES) referred to above. NHANES is a program, conducted by the Centers for Disease Control and Prevention (CDC), of studies designed to assess the health and nutritional status of adults and children in the United States.¹⁰⁹ The survey is unique in that it combines interviews and physical examinations. Another set of oral health measures maintained by the CDC is the National Oral Health Surveillance System (NOHSS).¹¹⁰ These measures are divided into 9 categories including dental visits, complete tooth loss, lost 6 or more teeth, fluoridation status, caries experience, untreated tooth decay, dental sealants, and cancer of the oral cavity and pharynx. Much of the data in NOHSS comes from the CDC Behavioral Risk Factor Surveillance System (BFRSS).¹¹¹ BFRSS is the world's largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. The CDC also oversees the National Health Interview Survey (NHIS).¹¹² NHIS data on a broad range of health topics are collected through personal household interviews. The U.S. Census Bureau is the data collection agent for the NHIS. The CDC website lists 11 other sources of oral health data or measurement tools.¹¹³

Another federal source of measures and data on oral health is the Medical Expenditure Panel Survey (MEPS) maintained by the Agency for Healthcare Research and Quality.¹¹⁴ MEPS is a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States. MEPS is the most complete source of data on the cost and use of health care and health insurance coverage. There are 43 topics listed within the MEPS data. There is also a section on dental visits, events and expenditures.¹¹⁵ One MEPS table that tracks expenses for dental services per person by payor source indicates that in 2008 only 5.7% of the dental care expenses in the U.S.

population were paid for by Medicare or Medicaid, 41.8% by private insurance, and the largest proportion, 49.7% were paid for out-of-pocket.¹¹⁶ As will be discussed later, this has implications for the incentives and political will for development and implementation of meaningful quality improvement programs.

Quality Measurement in the Oral Health Safety Net

Federally funded health centers have been at the forefront of developing and implementing quality programs for over 25 years. As far back as the 1970's health center dentists in federal Region II formed an association to look at developing care standards for managing health center dental practices in underserved communities. A manual, first published in 1985, called *A Comprehensive Quality Assurance System for Practicing Dentists: A Clinical Outcomes Management Approach* by Demby, Rosenthal and Angelo is still in use as a guide on how to assess clinical quality of care using a combination of chart/electronic dental record review (indirect) and patient examination (direct).^{117,118} The manual has had widespread penetration into health center oral health programs across the country as well as into the commercial sector. Today many clinics still use the manual's indirect chart review criteria as the basis for their peer review activities.

In 1998 the Health Resources and Services Administration (HRSA) initiated a quality initiative, the HRSA Health Disparities Collaborative, starting with ten pilot health center programs that targeted diabetes care. The collaboratives applied the Chronic Care model of disease management to Health Center populations with the goals of improving quality of care and health outcomes. Some of the diabetes collaboratives included oral health measures. In 2005 HRSA funded an Oral Health Disparities Collaborative (OHDC) pilot in four health centers, to ascertain if the Chronic Care Model was applicable to management of the most common oral diseases, dental caries and periodontal disease.^{119,120} The OHDC produced an *Oral Health Disparities Implementation Manual*.¹²¹ The manual lists 16 required or optional measures focused on perinatal oral health and early childhood caries prevention activities. As a result of the OHDC, the pilot dental programs learned how to create and utilize measures for quality improvement.

HRSA has begun implementation of a Clinical Quality Core Measure program.¹²² An initial set of 12 performance measures has been released as part of the larger clinical quality measurement and improvement initiative.¹²³ This initiative underscores HRSA's commitment to quality improvement and is being utilized to measure and demonstrate the quality of care across the agency as a whole. The quality core measures also address priority health conditions of HRSA safety-net populations, cover all life cycles, are amenable for quality improvement, and were selected for their relevance to HRSA programs. While none of these initial measures address oral health issues, HRSA had submitted a set of 11 oral health measures to NQF with the intent to incorporate these as measures of safety net performance in the future.

Dr. Jay Anderson, former HRSA Chief Dental Officer, reported in 2010 on a HRSA Oral Health Quality Initiative to address the need to incorporate oral health performance and quality strategies in the Agency's overall quality program.¹²⁴ The purpose of the Oral Health Quality Initiative was to promote efficiency in planning and implementation of oral health quality activities, to create agency level discussion of oral health quality measurement including roles, practices and results, to promote collaboration and efficiencies around quality priorities and measurement, and to support HRSA Programs in their quality initiatives. The Oral Health Quality Initiative sought to align HRSA program quality care measures with nationally accepted quality indicators that would be useful for determining trends, benchmarks and comparisons. In 2009, an internal HRSA oral health work group identified a set of oral health quality measures. The group was representative of key dental program staff across the agency. They proposed adoption of a set of oral health measures across HRSA programs. These measures related to activities in a given measurement year and include the percentage of:

- all dental patients for whom a Phase I treatment plan is completed,
- patients who received oral health education by a dentist, dental hygienist, dental assistant and/or dental case manager at least once,
- children between 6 and 21 years of age who received at least a single sealant treatment,
- patients who had at least one dental visit,

- oral health patients that are caries free,
- children 12 to 72 months of age defined as being at higher-risk of dental disease who receive 1 or more fluoride varnish applications,
- children 12 to 48 months of age whose parents or guardians received patient education and anticipatory guidance for oral health in the medical setting,
- all oral health patients who received a periodontal screening or examination at least once, and
- patients, assessed with moderate to high risk of developing dental caries, who received at least one topical fluoride treatment.

The measures listed above were exploratory models/concepts that are subject to future evaluation and discussion. The proposal was for HRSA FQHC grantees to be required to develop and/or select an oral health measure to report to the HRSA Uniform Data System. Because there are no nationally accepted measures, the grantees have the flexibility to report on quality measures of their own choice. This open selection process is effective for internal validation of site-specific quality measures, but it does not allow for comparison between organizations.

Some HRSA funded programs, not directly related to oral health, have also developed quality measures that include oral health.¹²⁵ An example is measures developed for HRSA's HIV/AIDS Bureau's (HAB's) quality initiatives which include measures related to:

- dental and medical history,
- dental treatment plan,
- oral health education,
- periodontal screening or examination, and
- phase 1 treatment plan completion.

Quality initiatives are also taking place within the National Network for Oral Health Access (NNOHA), the national organization composed of oral health providers working in health centers and other safety-net programs. NNOHA has developed an *Operations Manual for Health Center Oral Health Programs*.¹²⁶ The sixth chapter, due to be released in the Fall of 2011, focuses on quality in health center/safety-net oral health programs. The chapter explores two

facets of an oral health quality program: quality assurance and quality improvement. While there are several models for quality improvement, the chapter focuses on the two utilized by the HRSA/BPHC Health Disparities Collaboratives — the Chronic Care Model and the Model for Improvement. Several resources, tools, and links are also provided for oral health programs to implement or enhance their QI programs.

One of the most frequent requests from NNOHA members is for information on peer review tools and quality improvement measures. NNOHA has created a work group to look at the quality measures being developed by other initiatives and their appropriateness to safety-net populations.

Oral Health Quality in Large Group Dental Practices

There have been attempts to measure and improve the quality of care in group dental practices for several decades. At the 1989 Robert Wood Johnson (RWJ) sponsored conference of the RWJ Dental Services Research Scholars Program, a number of papers were presented on oral health quality measurement and improvement.^{127,128,129,130} There was general recognition among these authors and others that measurement systems in place at that time were too focused on evaluating technical procedures or the structure of dental practices and needed in the future to include measures of patient outcomes. They tended to function as quality assessment (QA) programs, measuring dental records and office operations against a predetermined set of practice guidelines, as opposed to quality improvement (QI) activities. Today, there are many dental plan associations, groups and practices that continue to use procedure and structure-based “quality audits” to monitor performance of dental providers or to comply with state regulations that an audit system be in place. These audits function as “peer feedback” processes. Most state regulations mandate that audit processes be performed but do not require those conducting the audits to prove that they improve health outcomes. In fact, it is commonly understood that it is almost impossible to “fail” an audit.¹³¹ However, some health plans and large group practices are developing more comprehensive quality improvement programs as the examples below describe.

HealthPartners

HealthPartners is a Minnesota-based consumer-governed medical and dental collaborative organization including a medical group and comprehensive medical plan, a dental group and dental plan.¹³² HealthPartners Dental Group (HPDG) consists of 21 HealthPartners dental clinics across the seven-county greater Twin Cities metropolitan area as well as 2,200 dentists in the HealthPartners Preferred Provider Organization network who practice throughout Minnesota, Wisconsin, North Dakota, South Dakota, and Iowa. HealthPartners dental clinics serve more than 100,000 patients.

The HealthPartners organization has embraced improvements in health care through a focus on the Triple Aim and the IOM definitions of quality in health care.^{12,18,133,134} Significant results have been achieved including: reduced hospital-acquired infections; development of a decision support tool for high-tech diagnostic imaging which prevented unnecessary scans, reduced radiation exposure, saved time for clinicians and patients, and saved an estimated \$60 million across HealthPartners and four other major health plans; improved mammogram screening rates among women of color; post-hospital coordination which resulted in a decreased re-hospitalization rate when compared to the community norm; and consistently high patient satisfaction ratings.¹³⁵

HPDG has developed and submitted clinical care guidelines to the AHRQ National Guideline Clearinghouse.⁹¹ There are currently seven HealthPartners Dental Group developed guidelines listed in the AHRQ Guidelines database. These include:

- assessment and management of dental caries,
- standardized assessment of periodontal disease,
- treatment planning
- diagnosis and treatment of endodontic emergencies
- detection and assessment of oral cancer,
- diagnosis and management of periodontal diseases, and
- indications for extraction of third molar teeth.

Performance in adhering to these guidelines is reflected in their providers' compensation.

HealthPartners has also developed an electronic health record that can alert dental providers to the existence of a general health condition that might impact oral health such as diabetes, chronic obstructive pulmonary disease, congestive heart failure, and xerostomia. There is also a study underway about the impact of an EHR-embedded clinical decision support tool developed to help dental hygienists and dentists conduct personalized tobacco cessation counseling and referral to cessation resources. Findings of a 2008 survey to measure patients' perceptions of how well their risk level was explained to them were motivating to providers. Coupled with an "RVU" system where providers could be compensated for time spent with health promotion and other non-procedure based activities, the proportion of patients reporting problems with understanding their risk level dropped from 27.1% to 14.8% within a year.¹³⁶

American Dental Partners

American Dental Partners was founded in 1995. The company assists with organizational planning and development, recruiting, training and leadership development programs, quality assurance initiatives, facilities development and management, employee benefits administration, procurement, information systems and practice technology, marketing and payer relations, and financial planning, reporting and analysis. Today it is affiliated with 26 dental groups in 21 states.¹³⁷ A strategic goal for the company is that each of the affiliated practices pursues accreditation by the Accreditation Association for Ambulatory Health Care ("AAAHC"). AAAHC is a private, non-profit organization formed in 1979 to advance and promote patient safety, quality and value for ambulatory health care through peer-based accreditation processes, education and research.¹³⁸ AAAHC currently accredits almost 5,000 organizations in a wide variety of ambulatory health care settings including dental offices. AAAHC accreditation is a quality assurance (QA) process, measuring dental office records and operations against a pre-determined set of "standards".

Quality Improvement in the Dental Benefits Industry

Historically, dental benefits companies attempt to improve the oral health of their beneficiaries by paying for services that have been deemed to improve oral health.¹³⁹ Dental benefits companies traditionally measure the use of services

as a measure of quality. Utilization statistics are used as a measure for access to care. The use of diagnostic and preventive services as a measure of quality is based on the concept that early detection leads to early treatment which leads to less disease.¹⁴⁰ However, these measures are traditionally derived from claims data. Claims data can only identify the procedures that an individual received. Unfortunately, there are no diagnostic measures in common use to determine the oral health status of the individual at the time of treatment. Nor is there any information to determine the appropriateness of the services provided. Without this information it is very difficult to measure the outcomes resulting from the services.

Some dental benefits companies are attempting to use different strategies to measure the impact of the benefits they administer. Delta Dental of Massachusetts has analyzed claims data from 250,000 members and found those with the most active disease did not necessarily receive adequate preventive care.¹³⁹ As an example they were able to determine that only 45% of children, age 6-15, and 20% of children, age 16-18, who had cavities in the past three years had received the American Dental Association's recommended two annual fluoride applications. They found the same results with low- and high-risk children, indicating a closer correlation between benefit coverage than health risk. These findings resulted in a campaign to educate providers and patients on their preventive services coverage and promote the use of those services to improve oral health. In addition, Delta Dental has implemented a performance measurement report for their member accounts, enabling companies to easily track healthcare trends across their employees, and view comparative benchmarks from similar organizations. This report, which references evidence-based clinical guidelines, includes data on members such as health status, if needs are met, and how well chronic disease and prevention are being addressed.

Another strategy employed by dental benefits companies is to "profile" the dentists that participate in their networks.¹⁴¹ Provider profiling is the process by which submitted claims data are collected for the purpose of analyzing the practice patterns of dentists. The practice patterns of dentists are identified using a statistical model to determine practice norms for a particular procedure or group of procedures. Commonly, a practice pattern that is two standard deviations or more from the norm is considered to be aberrant. In

keeping with service use metrics, provider profiling provides a guide to evaluating overutilization as well as underutilization. The majority of interest is placed on overutilization because of its economic impact. In this area dental benefits companies attempt to improve quality by at least not paying for services that are deemed not to be appropriate. Since there are no universally accepted standards for dental necessity for every procedure, the dental benefits companies have adopted professionally accepted criteria that would justify the service being rendered. This criterion is the governing policy that allows payment for a given service. Oftentimes, dentists will be required to submit evidence that clearly indicates the need for the services rendered. The evidence, narratives and diagnostic images, is measured against the company's criteria to determine payment. This process of clinical review represents a measure of the technical application of service use quality provided by the dental benefits company.

An additional strategy being developed in the dental benefits industry is the use of historical claims data to determine risk for an individual and the use of risk assessment to drive care.^{140,141} There are acknowledged limitations to this approach. The claims data provide information for only those patients who were continuously covered by the dental benefits company for a prescribed period of time. The claims database cannot account for any individuals who have not sought treatment or who received unneeded treatment or did not receive needed treatment. Even with these limitations, however, risk can be assigned to a large portion of the insured patient population and responses to risk measured.

In one study, managed care dental plans worked with providers, purchasers, and public health programs to develop quality measures in plan associated dental practices.¹⁴² They developed measures in three domains:

- Effectiveness of Care (EoC) which included measures of caries activity and caries risk and of periodontal disease,
- Use of Services (UoS) which included measures of ratios of services such as preventive vs restorative and endodontics vs extractions, and
- Access/availability of care (AoC) which included the percentage of enrollees receiving an examination within a year and the percentage of plan providers who were accepting new enrollees.

These studies developed a number of valuable measures that can be used by the dental benefits industry.

Quality Improvement Efforts in Organized Dentistry

Through collaboration between the Centers for Medicare and Medicaid Services (CMS) and the American Dental Association (ADA), a Dental Quality Alliance (DQA) has been formed.¹⁴³ This is the first multi-stakeholder consensus group formed to develop dental quality measures. The DQA currently has 27 members. The objectives of the DQA are “to identify and develop evidence-based oral health care performance measure and measurement resources, to advance the effectiveness and scientific basis of clinical performance measurement and improvement, and to foster and support professional accountability, transparency, and value in oral health care through the development, implementation and evaluation of performance measurement.” The initial focus will be on program performance measures for Medicaid and CHIP. The DQA will utilize the criteria elements from the National Quality Forum (NQF) in a rigorous process that will ensure the validity, reliability, usefulness and feasibility of the measures developed. The DQA will strive to develop measures that will actually drive an improvement in the oral health of a measured population.

The American Dental Association has been involved for several decades in the development of a diagnostic coding scheme called the “Systemized Nomenclature of Dentistry” (SNODENT).¹⁴⁴ The current version, called SNODENT II is being beta-tested at several dental schools, government agencies, and by other groups. The ADA is also revising the universal dental claim form to include diagnostic code reporting.

Hospital Dental Department Quality Improvement Efforts

Most hospitals are accredited by the Joint Commission, an independent, not-for-profit organization.¹⁴⁵ The Joint Commission accredits and certifies more than 19,000 health care organizations and programs in the United States. Dental programs within hospitals are expected to comply with Joint Commission standards. These include standards related to quality improvement activities. Therefore, hospital dental departments are more likely to have quality improvement programs in place than other

dental care providers. For example, the hospital dental department at Boston Children's Hospital has undertaken a transformative quality improvement program over the last several years that has resulted in significant change in the oral health care delivery model and in patient experiences and health.¹⁴⁶ For children with Early Childhood Caries (ECC) a disease management approach was substituted for the previously employed surgical approach that had most children with ECC undergoing dental treatment with general anesthesia. Using process and health outcome measures to track the results of this approach revealed that significantly fewer ECC patients experienced new cavitation compared to a historical control group and fewer ECC patients were referred to the operating room and experienced pain. This quality improvement approach is now being tested in multiple additional dental practices.¹⁴⁷

Dental Practice-Based Research Networks

Another approach to improving quality in oral health is the creation of large dental practice-based research networks. In March 2005, the National Institute of Dental and Craniofacial Research (NIDCR) awarded three seven-year grants, totaling \$75 million, to establish practice-based research networks that investigate with greater scientific rigor everyday issues in the delivery of oral healthcare.¹⁴⁸ The impetus behind the networks is the frequent lack of research data to guide treatment decisions in the dentist's office. These research networks are examining many clinical questions which could help drive clinical practice toward more effective therapies and be incorporated in oral health quality improvement programs. Examples of topics being studied are: the impact of dental hygienists' tobacco cessation efforts; decision and effect of replacement dental restorations; the feasibility of blood sugar testing in dental practice; and the impact of practice-based research on the practice of dentistry.^{149,150,151,152}

ORAL HEALTH QUALITY SYSTEMS LAG BEHIND THOSE IN MEDICINE

As the preceding sections demonstrate there are many oral health measures, guidelines, and other sources of data being developed and used across multiple sectors of the oral health care industry. However, in spite of these efforts oral health systems lag behind those in general health because

of a limited systematic and organized quality improvement agenda in place to improve quality in dentistry. There are many reasons why the development and implementation of quality measurement and improvement systems in oral health services lag behind those in medicine. Bader has documented some of the factors leading to this situation.²¹ These include an emphasis on assessment of the technical excellence of restorations which is not associated with long term treatment outcomes. In addition diagnostic codes are not generally used in documenting oral health services. This makes it difficult to analyze why a given procedure was performed or what the long term outcomes of treatment were. Finally, as noted earlier, there is a limited evidence base for most procedures performed in oral health care and as a result, there are widespread unexplained variation in clinical decisions among dentists.^{73,74,75} Bader concluded that too often the dental profession has regarded quality assessment as an evaluation of clinician, rather than of the effects of clinicians' efforts on patients' health. These findings are in line with those in general health and support the call for a fundamental shift from "paying for volume" to "paying for value."¹¹

Voinea-Griffin described factors that influence the slow adoption of quality improvement activities and performance-based programs in dentistry.⁷⁹ The barriers identified include the lack of bargaining power by dental insurers due to relatively few Americans (adults) having dental insurance coverage as compared to medical coverage.¹¹⁶ Also noted are the large number of different dental insurance plans; lack of acceptance of quality assessment measures and finance-driven practice by the dental profession; and lack of large group practices in dentistry which are important ingredients for quality improvement work.

While there are oral health patient outcome measures that have been developed and validated, they are not in widespread use. For example outcome measures have been developed for oral disease morbidity, disability, social functioning, and patient satisfaction.^{153,154,155,156} A great deal of psychometric work has been done to assess the precision, reliability and validity of these measures. Likewise, dental epidemiologists have considerable experience collecting population oral health data. A major problem with current oral health outcome data is that these types of data are typically collected at the national level. Little outcome data is available at the state or community level. For example the use of the national oral

health outcome data (e.g., NHANES) is actually quite limited except to assess general trends and oral health disparities among selected demographic groups. The problem is that most local health departments do not have the resources or expertise to do oral health surveys for large local populations.

In general, dental care delivery organizations do not participate in quality assessment or QA programs because 95 percent of dental care is provided in privately owned and managed solo and two- and three-dentist practices. These practices are not part of any larger delivery organization that requires practice accreditation. Twenty years ago the W.K. Kellogg Foundation funded a project, DEMCAD, to develop a system for monitoring the quality of care provided in private dental practices.^{157,158,159,160} As part of this project, a formal protocol with criteria and standards was developed to assess the structure, process and outcome dimensions of general dental practices. The system was tested in 300 practices and found to be effective. The DEMCAD system was never implemented by any state dental association, payer organization, or public regulatory group.

A related reason for the lack of dental quality improvement systems is that federal and state governments only pay for about 6 percent of dental care nationally. About 50 percent of the population has private insurance, but it is divided up among a large number of private insurers. Thus, in general, neither dental practices nor dental patients are integrated into large provider or payer organizations that have the capacity, funds, and political will to establish meaningful quality improvement programs.

Other factors that contribute to the current state of quality activities in the delivery of oral health services are lack of training and incentives to implement quality improvement programs and a lack of infrastructure for data collection. The Accreditation Standards for Dental Education Programs only requirements about quality relate to what the school administration needs to do to ensure the “quality” of the educational program and patient care activities.¹⁶¹ There is no requirement to graduate students who understand the principles of quality improvement and their application to individual or population health.

The majority of dentists are solo private practitioners, working in relative isolation. This makes dissemination and adoption of standards more problematic compared to the medical profession where group practice in both

the ambulatory and hospital setting is more common. Although the use of electronic health records (EHR) is spreading in clinics and dental practices, most use them for patient tracking and billing and few are intra-operable or share data across providers or delivery systems.

One of the main reasons why quality improvement activities in dentistry are less well developed is that dental care is procedure-based rather than diagnosis-based. It is difficult to assess appropriateness and outcomes of treatment without knowing the diagnosis for which a particular procedure was performed. There are also difficulties in developing long-term outcome measures because of a lack of valid, easily obtainable criteria. For example, in medicine it is relatively easy to measure if blood pressure or glucose levels have quantitatively improved following a short course of treatment. In dentistry, it is often difficult to measure whether treatment has improved periodontal disease or caries risk.¹⁶²

One additional factor that may account for the under-development of quality improvement activities in dentistry is the fact that dentistry is simply undervalued by policymakers, funders and the public. For example, almost none of the studies and examples cited in the National Strategy for Quality Improvement in Health Care Report to Congress (March 2011) mention anything about dentistry.⁵¹ Medicare contains essentially no dental benefit and Medicaid dental benefits for adults are considered optional. Among the many quality-related provisions of the Accountable Care Act (ACA), few relate to dentistry. Because dentistry is not viewed as a component of primary care, the rate increases for primary care physicians required by the ACA do not extend to dentists. Dentistry only became a required component of CHIP programs with the relatively recent reauthorization of that program. And in the commercial marketplace, dental benefits are usually among the first benefits to be eliminated during economic downturns.

Finally it is expensive to develop and implement QI programs. Few studies have directly examined this issue, but it is very likely that most dental QI systems will not be self-supporting. This means that government or purchasers will have to cover QA system expenses. Unfortunately, in this cost containment era, there is little appetite for increasing costs in an effort to improve quality. Now, public and private purchasers are demanding insurers have quality systems in place, often pretending that they do not cost anything to implement. In fact, they are expensive,

and payers will find ways to reduce benefit expenditures to cover these QA program costs and still maintain acceptable profit margins.

FUTURE TRENDS IN ORAL HEALTH QUALITY MEASUREMENT AND IMPROVEMENT

Electronic Health Records

The increased utilization of electronic dental records (EDRs), electronic practice management tools and patient registries will likely have a positive impact over time on future advances related to oral health quality measurement and improvement. The HITECH Act, mentioned earlier, provides incentives for adoption of electronic health records (EHRs). However these incentives are tied to development and use of measures of “meaningful use.”¹⁶³ Meaningful use refers to the use of information in the EHR to improve the quality, safety and efficiency of patient health care.¹⁶⁴ It is likely that there will be requirements in the future for oral health care systems to include meaningful use of the EDR in order to receive federal health funding. In addition to requirements to analyze data in the EDR in order to improve quality, electronic systems have the potential to increase the ease and efficiency of data collection. Population-based information could be collected from service level, patient level, provider level and systems level data. Quality and performance measures can be incorporated into these tools to help guide and/or assist dental clinicians in decision making, better patient communications, higher quality improvement, and more accurate and timely reporting.

Diagnostic Codes

Another barrier that will need to be overcome is the absence of diagnostic codes in oral health care, since without knowing why a procedure was provided it is difficult to assess the outcome of that treatment. Attaining measureable improvements in oral health, however, means that there also needs to be a way of measuring *oral health*, not just the processes, or even the outcomes, of oral health *care*. While there have been a number of attempts to develop and standardize oral health status indicators, including measures of self-assessed oral health status,¹⁶⁵ oral health quality of

life,¹⁶⁶ and others,¹⁶⁷ there remains no universally-accepted construct. Most likely this will be some type of composite measure comprised of several dimensions of oral health.

Dental Benefits Industry Quality Improvement Activities

Dental benefits companies are continuing work to develop meaningful quality improvement activities. A significant barrier that will need to be overcome is the traditional adversarial relationship between organized dentistry and the dental benefits industry. As long as metrics and reimbursement are limited to measurement of use and do not include some quantification of outcomes, the development of meaningful quality improvement activities will be hampered by this relationship. Current reimbursement models reward dentists for the volume of procedures they perform or visits they conduct. This model directs the focus of quality primarily towards the technical and use aspects of quality improvement. This model also creates a situation in which dentists and dental benefits companies appear to be fighting over the same health care dollars. Some dentists believe that dental benefits companies make money by not paying dentists for the services they provide. Dental benefits companies monitor dentists’ practice patterns to identify over utilization and unnecessary services. Both sides believe that they are working in the best interest of the patients. In the future a collaborative effort must be made by both the dental benefits industry and organized dentistry to develop meaningful quality improvement activities.

A step forward was taken when the American Dental Association agreed to spearhead the Dental Quality Alliance on behalf of the Center for Medicare and Medicaid Services (CMS). The Dental Quality Alliance has brought together representatives from organized dentistry and the dental benefits industry to craft a definition and initiatives to identify quality and quality metrics. The hope is that the mistrust between parties will not delay or fail to deliver a viable product. The key lever at the disposal of the dental benefits company is reimbursement. The challenge is to create a new reimbursement model that rewards dentists for value as measured by health outcomes. The first obstacle to overcome is the tradition embedded in the minds of all stakeholders from our current fee-for-service model. For the dental benefit company it requires system modifications to accommodate new information in the adjudication process. Dental benefits companies must

determine reasonable compensation to drive the desired behavior in dentists. Dental benefits companies must be able to receive additional data beyond procedure codes to be able to track the delivery of appropriate services and the impact on the health of the patient. Dentists must be able to document new processes and provide the information to the dental benefits company. This will require dentists to change processes in how care is delivered, recorded, and shared. Possibly the greatest challenge will come from the patient. Patients have also been indoctrinated to think about the quality of their dental health in terms of volume — use and frequency of services. This has resulted in procedures being institutionalized as quality measures to the point of entitlement. Evidence based care has brought into question the benefit of some of these procedures. The challenge is to undo or at least loosen portions of the educational doctrine of the past half century.

Integration of oral and general health activities

A major focus of both IOM reports released in 2011 is the integration of oral health care into general health care. The report, *Improving Access to Oral Health Care for Vulnerable and Underserved Populations*, points out that young children, for example, visit pediatricians and family physicians earlier and more frequently than they visit dentists. Similarly, for older adults living in institutions, nurses and nursing assistants often provide personal oral health care.²⁶ The report states that with proper training, these and other primary care providers are well situated to educate individuals about how to prevent oral diseases, to assess risk and screen for oral diseases, and to deliver preventive services. The report calls for increasing integration of oral health curriculum in the education of non-dental health care professionals. Similarly, the IOM report, *Advancing Oral Health in America*, concluded that non-dental health care professionals are well situated to play an increased role in oral health care, but require additional education and training.²⁵

An example of integration of oral health activities in general health care is the provision of preventive services by primary care medical providers for infants and toddlers, which include oral health screenings and risk assessment, anticipatory guidance and parent education, and the application of fluoride varnish. A decade long program in North Carolina had demonstrated the ability of fluoride varnish applied by primary care providers as part of a preventive

program to lower caries rates in Medicaid covered children.¹⁶⁸ The Pew Center on the States report, *Reimbursing Physicians for Fluoride Varnish: A Cost-Effective Solution to Improving Access*, indicates that 35 state Medicaid programs paid for physicians to perform oral health screenings and/or apply fluoride varnish.¹⁶⁹ As indicated earlier, in 2011 the National Quality Forum has developed National Voluntary Consensus Standards for Child Health Quality Measures.⁸⁰ As mentioned earlier, there are 43 measures which have been adopted, four of which are oral health measures. One of the endorsed measures is primary caries prevention intervention as part of well/ill child care as offered by primary care medical providers as measured by the extent to which primary care providers apply fluoride varnish.⁸¹

Health Disparities and Oral Health

As indicated earlier, the 2000 Report of the Surgeon General, *Oral Health in America*, stated that “Despite improvements in oral health status, profound disparities remain in some population groups as classified by sex, income, age, and race/ethnicity. For some diseases and conditions, the magnitude of the differences in oral health status among population groups is striking.”²⁴ Numerous other reports since 2000 have also highlighted these disparities.^{25,26,88,170} Also, as indicated earlier, there are now calls for inclusion of “disparities sensitive measures” when developing quality measures.^{44,45} However, in oral health there is little activity in this area. As described in this report, quality measurement in general in oral health is not widespread and there are few instances of quality measurements being used in feedback and incentive systems that improve health outcomes of any population being served, let alone specific populations.

In order for quality measurement and improvement systems to have an impact on disparities among racial and ethnic minorities, low-income populations and people with disabilities there will need to be a concerted effort to collect data about oral health disparities in these populations on an ongoing basis and use these data in feedback and incentive systems that alter the behavior of provider organizations and delivery systems in general. In fact, it is likely that it will take new delivery system models to improve the oral health of currently underserved populations and those with the greatest oral health disparities. New systems will likely involve:

- bringing care to community sites where these populations receive general health, social service and educational services,
- evolving new workforce models, and
- emphasizing prevention and early intervention in ways not possible in the current predominant delivery systems.^{25,26}

One example of an approach to improving oral health among racial and ethnic minorities and low-income populations was described earlier in the Boston Children's Hospital ECC study.¹⁴⁶ In addition to the findings reported earlier it was noted that it is not possible to predict which parent or family the disease management approach would resonate with. The project found that families from the entire socioeconomic spectrum lacked initial knowledge about the caries process and lacked understanding about how to prevent and manage the disease. However, most were receptive to learning more about the disease and available prevention and management strategies. There are now tools available to determine the risk of future dental disease, particularly dental caries, and it is possible to target specific interventions to those at greatest risk. Therefore, it would make good practice and economic sense to systematically apply a risk-based preventive and treatment approach to caries management, and to work in partnership with families to alter dietary and hygiene practices at home. These findings support the call in the IOM report, *Advancing Oral Health in America*, for widespread efforts to increase oral health literacy including information on understanding about: how to prevent and manage oral diseases; the impact of poor oral health; and how to navigate the oral health care system.²⁵ In fact, the Patient Protection and Affordable Care Act (ACA), Section 4102, called for the Secretary of the U.S. Department of Health and Human Services to awarding grants to demonstrate the effectiveness of dental caries disease management activities.¹⁰

In addition to enhancing oral health literacy, both 2011 IOM reports describe strategies to reduce health disparities including efforts to explore new payment and oral health care delivery methods, bring care to where underserved people are, integrate oral health into education and practice across general health disciplines, use new technologies and workforce models, and expand data collection to foster awareness and accountability.^{25,26}

Moving Oral Health Payment from Volume to Value

One of the biggest barriers that will need to be overcome is the transition to reimbursement systems that incentivize providers based on the value of the services they provide as measured by the health of the population they are serving. The dominant reimbursement system in use is fee-for-service (FFS) reimbursement. As long as there is a financial incentive to provide as many procedures as possible, it is likely to override any attempt to use outcome measures to reward performance. Similarly, encounter-based reimbursement systems, such as are used by Federally Qualified Health Centers (FQHCs), have a financial incentive to produce as many encounters as possible. Finally, capitation systems have just the opposite problem in that they provide an incentive for undertreatment. Unless and until there are value-based reimbursement systems that provide financial incentives for appropriate, risk- and evidence-based care and result in measureable improvements in oral health, it will be difficult to see major improvements.

While there are many Pay-for-Performance (P4P) systems being tried in medicine as a means of moving toward value-based care, this type of reimbursement arrangement is almost non-existent in oral health.^{4,5,6} Voinea-Griffin cites two examples of P4P systems in oral health care.⁷⁹ HealthPartners Dental Group (HPDG), a large group dental practice in the greater Minneapolis, MN area, described earlier, initiated a P4P incentive program after implementing a caries risk assessment guideline in 1996. They found initially that only 25% of the providers were performing and recording the risk assessment. After implementing a payment incentive directly tied to this activity in 1996 compliance rates jumped to over 90%. In 2010 compliance is now more than 98% in spite of the specific incentive payment no longer being tied to this activity. This is consistent with the Operant Conditioning model where rewards applied every time can be faded to intermittent rewards yet learned behaviors continue.

Another example cited by Voinea-Griffin is the Kaiser Permanente Dental Care Program in northwest Oregon and southwest Washington which employs about 120 dentists in their Permanente Dental Associates, for-profit, professional corporation. In 2007 they created a specific financial performance incentive for their dentists to engage in tobacco cessation counseling and referral assistance activities. They were able to demonstrate in 2008 that 98% of smokers received cessation counseling and an assisted

referral attempt. This P4P system was successful in terms of the adopted process performance measure. However a simultaneous review of the number of smokers who actually accepted the referral did not change. This experiment is a reminder that performance measures in P4P systems should be as close to the ultimate health outcome as possible, and if the performance is based on process measures, care should be taken to incentivize process activities that have been proven to be effective.

It seems likely that as understanding grows about creating effective incentives for providers, Pay-For-Performance systems will be instituted in oral health care.

New Oral Health Delivery Systems

As additional measures are developed and those already developed are put into use, these tools should ultimately be used to improve oral health outcomes and oral health status among the public. In addition to changing activities of providers within the current delivery system, use of oral health measures will begin to influence the structure and function of the delivery system itself. For example, many believe that much can be done outside the traditional dental office setting to improve oral health, e.g., by providing preventive services, oral health education and patient navigation in community-based settings. Systems that reward providers for “value and not volume” will drive changes in the direction envisioned by the IOM report, *Improving Access to Oral Health Care for Vulnerable and Underserved Populations*.²⁶ That report calls for oral health research and evaluation related to underserved and vulnerable populations, including: new methods and technologies (e.g., nontraditional settings, nondental professionals, new types of dental professionals, and telehealth); measures of access, quality, and outcomes; and payment and regulatory systems.

CONCLUSIONS

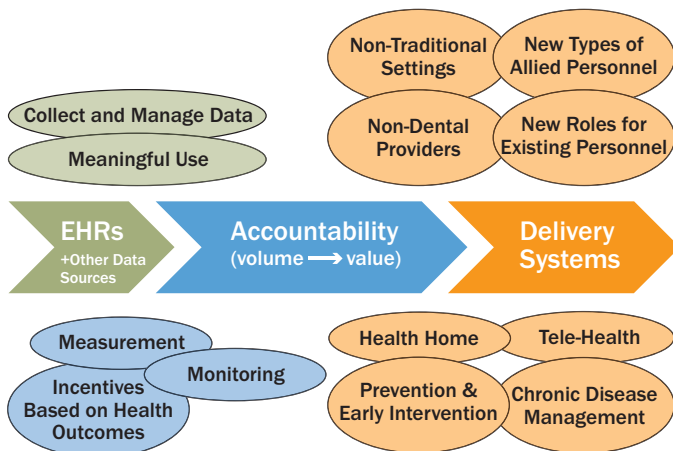
The U.S. health care system has entered the “era of accountability.” As described in this report the drivers of change include concern about the rapidly increasing costs of care, concern about unwarranted variability in costs and outcomes, and recognition of the profound health disparities that exist among racial and ethnic minorities, low-income populations, people with disabilities and

other vulnerable populations. These drivers are pushing the health care system to make progress on the triple aims of improving the experience of care, improving the health of populations, and reducing per capita costs of health care. These drivers of change apply not only to general healthcare, but oral healthcare as well. The rapidly increasing cost of oral health care, the large numbers of people who cannot or do not take advantage of the current oral health delivery system, unwarranted variability in care, and the existence of profound oral health disparities among segments of the population are attracting increasing attention. Although efforts to institute quality improvement systems in oral health care lag behind those in general health care, they do exist and are increasing.

Even with increasing activity by many groups that are developing and using measures of oral health quality, current activities to spread the use of these measures and to improve quality in oral health care are still in their infancy. Oral health measures are not in widespread use, they are generally voluntary and not tied to consequences for poor performance, and they tend to emphasize the lowest levels of quality measurement and quality assurance. There are few examples of robust quality improvement programs directed at measuring oral health outcomes of the population being served and incentivizing providers to alter their activities to improve those outcomes. In addition, although there is compelling evidence that there are significant oral health disparities based on race, ethnicity, socio-economic status, and disability, there are few measures of oral health performance tied to these issues and even fewer that provide incentives for providers of oral health care to do anything differently.

However, in spite of the fact that quality improvement systems in oral health are not well developed or in general use, and the fact that there are many barriers to change, there are opportunities for improvement as oral health care becomes more accountable. Figure 6 illustrates a pathway to move oral health care from the current emphasis on volume to an emphasis on value.

Moving Oral Health Care from Volume to Value**



**Value = health outcomes achieved per dollar spent over the lifecycle of a condition

Figure 6: Moving Oral Health Care from Volume to Value

The path ahead involves increased use of EHRs and other data sources, the establishment of accountability in the move from volume to value, and ultimately the evolution of delivery systems.

Some trends to watch and ideas to pursue on this path are:

- Pressures to control costs and provide care to currently underserved populations, including racial and ethnic minorities, low-income and rural populations and people with complex health conditions, will drive development and use of measures of oral health outcomes.
- Efforts to develop and use measures of oral health outcomes will drive development and use of diagnostic coding systems and other means of collecting data on oral health outcomes of populations.
- The spread of electronic dental records (EDRs) and integrated electronic health records (EHRs) will make collection and analysis of data easier, especially across providers, and incentives for meaningful use will drive and facilitate analysis of these data.
- As the use of oral health quality measurement and quality improvement systems develop, more attention will be drawn to the IOM-defined quality domains (i.e. creating an oral health care system which is safe; effective; patient centered; timely; efficient; and equitable).

- Pressures to control costs and improve oral health of vulnerable and underserved populations will drive accountability through innovation in payment mechanisms in a move from “paying for volume” to “paying for value.” This will mean developing and deploying payment, monitoring, and incentive mechanisms tied to the oral health of the population being served.

Pressures to improve oral health of vulnerable and underserved populations and the advent of accountable systems will drive innovation in oral health delivery models including an emphasis on using chronic disease management strategies, integrated health homes, and prevention and early intervention activities. These developments will be facilitated by changes called for by the IOM report, *Improving Access to Oral Health Care for Vulnerable and Underserved Populations* (e.g. delivering oral health care in nontraditional settings, engaging non-dental professionals in delivering oral health services, developing new types of allied dental personnel or expanded roles for current allied dental personnel, and connecting geographically distributed providers of health serves through the use of telehealth technologies).

Don Berwick, in *The Triple Aim: Care, Health, and Cost*, indicated that the barriers to achieving the triple aim in the U.S. health care system “are not technical, they are political.”¹² While there may still be technical barriers in moving oral health care toward achieving the triple aim, many of the barriers are also political. The developments envisioned here will take concerted efforts by many individuals and groups to become reality. These include government at the federal, state and local levels; organized health professions; individual health care providers; the dental and general health benefits industry; private philanthropy; and consumer groups. The 2000 Report of the Surgeon General, *Oral Health in America*, elevated the visibility of oral health disparities in America. Now, the pressures and opportunities arising in the “Era of Accountability” will be the road to address these issues.

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