

Integration of Medical and Dental Records to
Improve Healthcare Outcomes, Costs, and Overall
Public Health.

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Executive Summary

Since the beginning of modern healthcare, medical records and dental records have existed as separate healthcare domains. While this separation appeared to serve well for many years, significant changes in healthcare have occurred and this separation is now obsolete and may be harmful. The growing understanding of how dental affects medical (systemic) and vice versa suggests that continuation of this separation leads to incomplete, inaccurate, inefficient and inadequate treatment of both medical and dental disease. Dentistry and Medicine need to harmonize. To facilitate this change and to assure the highest quality care and safety for patients, this report recommends specific actions to address specific problems. The essential core improvement to achieve these goals is the integration of medical and dental care and data.

Currently medical records and data exist separate and distinct from dental records and data. There are many potential intersections in which the medical records can inform the treatment of dental problems and vice versa. Unfortunately, there is no systematic information exchange at these intersections. This leads to a number of problems. Among these problems are:

1. There is poor communication among medical and dental providers. Communication is practically non-existent for real-time cooperation involving patient care.
2. Data is duplicated and often inconsistent between the medical record and dental record.
3. Best practices guidelines that indicate a dental component to care is often ignored or left to the whim of the patient to pursue.
4. Structural barriers that make it hard to coordinate medical and dental communication and care.

Our Community Discussion group (a list of attendance appears in Appendix A) has agreed to a set of 12 recommendations that will begin to address the integration of medical and dental records to the benefit of all. In short they are:

1. Analyze, identify, and plan to resolve the discrepancies in shared medical and dental data.
2. Study the communication model practices (or lack of them) in existence. Establish a model with both medical and dental input that can be used across the spectrum of patient care. Sources of experience include but are not limited to Wisconsin Diabetes Guidelines, Marshfield Clinic, University of Detroit Mercy, Indian Health Service (HIS), Veterans Health Administration (VHA), and U.S. Military Armed Forces Health Longitudinal Technology Application (AHLTA) health care systems.
3. Health and Human Services (HHS) / Office of the National Coordinator (ONC) should continue leadership with regard to the integration of medical and dental

- care and data especially as it relates to National Health Information Network (NHIN) standards.
4. Evaluate Certification Commission for Healthcare Information Technology (CCHIT) standards to determine if changes and explicit acknowledgement of the importance of oral healthcare for systemic healthcare are needed.
 5. Analyze medical and dental insurance plans for their contribution to the continuing separation of medical and dental treatment. Where barriers to medical and dental integration are the result of the insurance process, changes are necessary. Specifically, the oral care needs of patients with medical problems needs to be represented within the medical and dental insurance benefit programs.
 6. Support and fund the terminology work necessary to ensure semantic interoperability of the data between medical and dental domains, i.e. when data is exchanged, the meaning is the same for the sender and the recipient.
 7. Strongly encourage standards organizations, such as Health Level 7 (HL7) and Healthcare Information Technology Standards Panel (HITSP), to embark on efforts to assess what adverse impact, if any, has occurred in standards development thus far because of the separation of medical and dental data and care delivery.
 8. Design incentives to encourage the training of additional dental informaticists. The integration of medical and dental records can only be accomplished with trained dental informaticists who understand the complexities of the effort leading the effort. Training opportunities should be open to dental auxiliaries.
 9. As the Association of American Medical Colleges (AAMC) and American Dental Education Association (ADEA) both recommend, move forward with modifications to medical and dental education (both pre-graduation and continuing) to assure that providers can deliver the best care that integrates the use of combined information systems and attention to oral and systemic health. Add informatics and IT training to expose the students to the reality that informatics and IT are now integral to clinical practice.
 10. Amend the Social Security Act of the U.S. to include provision for routine and preventive oral healthcare (dental care) as an integral part of systemic healthcare.
 11. Deal with liability concerns of providers and privacy concerns of patients with regard to EHR/EDR adoption and use of networks and registries. Network liability issues can be addressed by legislation like West Virginia §16-29G-5: Immunity from suit; limitation of liability.
 12. Facilitate affordable Electronic Health Record (EHR) / Electronic Dental Record (EDR) adoption. A clear and unambiguous statement on how a software provider, clinic, hospital, insurance company, etc. may be able to help fund the adoption of EHR/EDR without violating Stark is necessary.

Further details on each of these recommendations are in the body of the report.

Introduction

In Greek Mythology, there was a 9 headed monster called a Hydra. This creature would grow 2 heads to replace any single head that was cut off. One of the heads was immortal. Further, the Hydra's blood was poisonous. Yet even this seemingly invulnerable monster was destroyed by Hercules with the aide his nephew, Iolaus, in a coordinated attack. In many ways, the problems with healthcare resemble a Hydra. Rapidly rising costs, lack of insurance for large portions of the population, medical errors, etc. can be viewed as individual Hydra heads with rapidly rising costs as the immortal head. Unintended consequences, like measures to improve healthcare access that lead to reduced numbers of practitioners, are analogous to the poisonous blood. So, any success over the healthcare Hydra involves a carefully coordinated plan in which each head (an individual problem) is handled with careful attention paid to the poisonous blood (overall costs).

This report is the culmination of the Healthcare Community Discussion held on December 17, 2008 at Robert Morris University (and via web and teleconference for remote participants) in which the topic was the need to integrate medical and dental records in order to achieve improvements in chronic systemic diseases, avoid medical and medication errors, and improve the public health.

Background

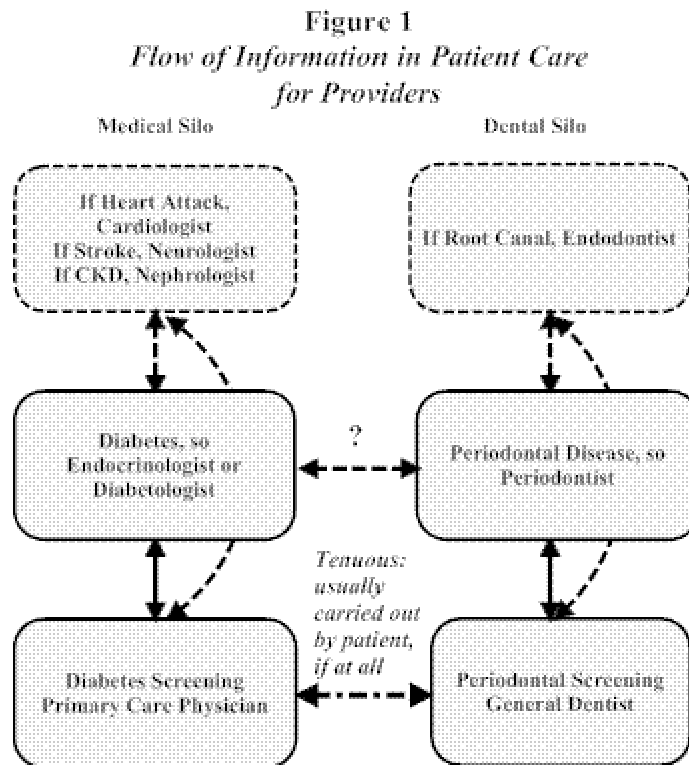
In health care today in the U.S., there are two “streams” of care, inadequately articulated: oral health care for the oral cavity and its associated structures (called dental care and delivered by dental providers (general dentists, periodontists, endodontists, etc. with degrees like DDS and DMD)) and systemic health care for the rest of the body (called medical care and delivered by medical providers (allopathic physicians, osteopathic physicians, nurse practitioners, etc. with degrees like MD, DO, DNP). This artificial division of care into organizational silos ignores the fact that the mouth is part of the body (NIH, 2000).

This siloization in the U.S. persists despite international recognition of the need for integration of the disciplines. According to the World Health Organization (WHO), “The strategy is that oral disease prevention and the promotion of oral health needs to be integrated with chronic disease prevention and general health promotion as the risks to health are linked.” Further, “The objectives of the WHO Global Oral Health Programme, one of the technical programmes within the Department of Chronic Disease and Health Promotion, imply that greater emphasis is put on developing global policies based on common risk factors approaches and which are coordinated more effectively with other programmes in public health. The policy of the WHO Global Oral Health Programme emphasizes that oral health is integral and essential to general health, and that oral health is a determinant factor for quality of life.” Also, with regard to health information technology, “The WHO/FDI goals for oral health by the year 2000 urged Member States

to establish oral health information systems, and this remains a challenge for most countries of the world. The WHO Oral Health Programme is prepared to assist countries in their efforts to develop oral health information systems which include data additional to epidemiological indicators.” (Petersen, 2008) According to WHO’s “Global goals for oral health 2020,” (Hobdell et al., 2003) Goal 2 is “To minimize the impact of oral and craniofacial manifestations of systemic diseases on individuals and society, and to use these manifestations for early diagnosis, prevention and management of systemic diseases,” and Objective 6 states, “To integrate oral health promotion and care with other sectors that influence health, using the common risk factor approach.”

Analysis of the Challenges

Poor Communication Channels Between Medicine and Dentistry.



The communication between the general dentist, who normally does the initial periodontal screening, and the specialist treating diabetes or stroke is typically indirect, proceeding through the Primary Care Physician (PCP) via the chart, EHR, or relies on the patient’s initiative. Any medical specialists (endocrinologists, cardiologists) treating a patient are ordinarily dependent on the patient’s primary care physician for contact with the providers in the same patient’s dental silo. A neurologist treating stroke, for example, who might gain in the processes of diagnosis and treatment from a well-established model of interdisciplinary medical-dental communication, is dependent on the referring

PCP for dental information, and that referring PCP might not have a direct channel of communication with the patient's dental provider(s). Figure 1 shows a dotted line (labeled with a question mark) for possible communication between an endocrinologist or diabetologist and periodontist. Unfortunately, they lack a systematic approach to communication with each other. Instead the provider teams (physician and nurse on the medical silo and general dentist and dental hygienist, in the dental silo) must, on their own initiative, obtain the patient's other-silo information. In general this connection must also be regarded as tenuous, as reflected in the dot-dash line. The arrow in the diagram might suggest that the communication is provider to provider. In reality, the cross communication, is dental provider via patient as active carrier of the message to the medical provider. Unfortunately, providers are ill-prepared to engage at this level of cooperation. A well-established model for efficient communication among medical and dental providers who care for the same patient does not exist. Thus the Scottsdale Project identified a need for "a set of guidelines should be developed to define what is important for bidirectional interprofessional communication."

Providers in both silos sharing care of patients need accurate information on medications prescribed in the other silo (blood thinners, antibiotics, pain medications) and on certain tests ordered in one of the silos. Haughney et al. (1998) reported that "the joint use of patient record systems avoided discrepancies in patient information which would have affected the quality of patient care" and "joint consultations reduced the need for secondary referrals." Geist and Geist (2008) stated, "physicians often do not provide adequate information regarding patients' medical conditions when presented with consultation requests generated by dental students and their instructors about the students' patients."

Oral Disease co-Morbidities with Systemic Diseases

There is sufficient evidence that the presence and severity of dental conditions have deleterious effect on systemic health and may actually make systemic diseases worse. Dr. Mary Lee Conicella, Aetna Dental's national director of clinical operations stated, "The association between oral health and systemic health is consistently demonstrated in clinical studies, and the findings are positively impacting the treatment and management of patients." Further she stated, "Specifically, there is a significant body of research that indicates pregnant women and individuals with diabetes or heart disease benefit from early periodontal care.

In this section we review the evidence on the relationship of dental disease to systemic diseases. This is not meant to be a comprehensive review but merely a recitation of some of the best evidence to prove the connection between oral disease and systemic disease.

Dental Disease as an Open Bacterial Infection.

Dental disease can be generally classified as a bacterial infection. The oral flora contains more than 400 bacterial species, some of which are pathogens. Any compromise of the integrity of healthy oral tissue along with increases in the ratio of pathogens to harmless bacteria in the bacterial flora provides a route for invasion of these pathogens into the body tissue, circulatory system, or respiratory system. Untreated, the pathogens have 24/7 access to the rest of the body.

In a healthy periodontium the body's immune system fends off the periodontal pathogens. In people with diabetes, the immunoinflammatory response of the periodontium is markedly altered. Diabetes causes changes in the function of immune cells including neutrophils, monocytes and macrophages. Neutrophil adherence, chemotaxis and phagocytosis are often impaired. The sum total of the effect of diabetes on the immune system is that the patient is more susceptible to periodontal disease (the most common dental disease associated with systemic diseases) and the presence of periodontal disease is a route for invasion by bacteria or bacterial by-products. (Mealy and Rose, 2007).

Prevalence of Diabetes and Periodontitis

The most significant relationship between oral disease and systemic disease in terms of number of people affected, the severity of the co-morbidities, and the costs to treat the complications due to the co-morbid conditions is the relationship between diabetes and periodontal disease. Healthy People 2010 (2000) includes a national objective calling for at least 75% of people with diabetes to regularly have at least one dental visit annually by the year 2010. According to Mealey and Rose (2007), "the presence of periodontal diseases can have a significant impact on the metabolic state in diabetes. Diabetic subjects with periodontitis have a six-fold higher risk for worsening of glycemic control over time compared to diabetic subjects without periodontitis. Periodontitis is also associated with an increased risk for diabetic complications. In one study, 82% of diabetic patients with periodontitis experienced one or more major cardiovascular, cerebrovascular or peripheral vascular events during the study period of 1–11 years, compared to only 21% of diabetic subjects without periodontitis."

Statistics and analysis reveal the scope of the problem as well as the potential benefit from improving periodontal health among diabetics.

1. Center for Disease Control's (CDC) estimated diabetes costs in the United States in 2007 (CDC, 2007):
 - a. Total (direct and indirect): \$174 billion.
 - b. Direct medical costs: \$116 billion.
 - c. Indirect costs: \$58 billion (disability, work loss, premature mortality).

2. Prevalence of diagnosed and undiagnosed diabetes in the United States, all ages, 2007 (CDC, 2007):
 - a. Total: 23.6 million people or 7.8% of the population have diabetes.
 - b. Diagnosed: 17.9 million people.
 - c. Undiagnosed: 5.7 million people.
3. Periodontal disease prevalence (Elke, 2007):
 - a. Affects 34% of the American population aged >30 years (36 million persons).
 - b. Severe in 13% of adults.
4. According to Mealey and Rose (2007):
 - a. 82% of diabetic patients with periodontitis experienced one or more major cardiovascular, cerebrovascular or peripheral vascular events during the study period of 1–11 years, compared to only 21% of diabetic subjects without periodontitis.
5. According to American Heart Association (AHA) statistical update (2007):
 - a. Total US cost for stroke care in 2007 was 62.7 billion.
 - b. Each year about 700 000 people experience a new or recurrent stroke.
 - c. Lifetime care \$140,048 per case, in 1999 dollars.

If we assume an equal distribution of periodontal disease across the U.S. population, there are 8 million diabetics with periodontal disease ($0.34 * 23.6$ million diabetics). In reality, the distribution of periodontal disease is probably higher in diabetics.

Among the 8 million diabetics with periodontal disease, 4.9 million cases ($(.82 - .21) * 8$ million) of major cardiovascular, cerebrovascular or peripheral vascular events occur.

Assuming equal distribution of cerebrovascular events, periodontal disease, and diabetes, there are 18,564 cerebrovascular events in diabetics with periodontal disease per year ($700,000 * 0.34 * 0.078$). Cerebrovascular events among this group cost 1.7 billion per year ($62.7 \text{ billion} * 0.34 * 0.078$).

If improved attention to periodontal disease in diabetics yields a 10% reduction in the incidence major cardiovascular, cerebrovascular or peripheral vascular events in diabetics with periodontal disease, you can expect improved health for 490,000 people ($4.9 \text{ million} * 0.10$).

If improved attention to periodontal disease in diabetics yields a 10% reduction in the incidence major cerebrovascular events in diabetics with periodontal disease, you can expect, in dollar terms, **a 170 million dollar savings** ($1.7 \text{ billion} * 0.10$) per year. Similar dollar savings should be achievable with cardiovascular and peripheral vascular diseases.

So a very real cost savings should be achievable.

Dental Infection in Chronic Cardiovascular Disease

Slavkin and Baum (2000) wrote, “in particular, we call attention to the ongoing research into the role of dental infection in chronic cardiovascular disease. Several prospective studies have demonstrated a significant association between dental infection and atherosclerosis or coronary heart disease.”

While the calculation of costs savings with dental infections and cardiovascular disease is not provided in this report, a similar calculation to the diabetes and stroke relationship should reveal similar type savings in healthcare costs.

Bisphosphonate-caused Osteonecrosis (ONJ)

Bisphosphonates are used to treat osteoporosis. However, like most medications, there are some adverse events associated with bisphosphonate use. Recently, there have been reports of osteonecrosis of the jaws (ONJ) in cancer patients receiving concomitant anticancer therapy (chemotherapy, steroid therapy, or head and neck radiotherapy) and an intravenous (IV) bisphosphonate (Damato et al., 2004). There are multiple recognized conditions and risk factors associated with the development of osteonecrosis (not limited to the jaws) in cancer patients. (Marx, 2003; Migliorati et al., 2003; Ruggiero et al., 2004). Specific to dentists, ONJ has occurred after an otherwise routine extraction of a tooth. This complication has often appeared years after the bisphosphonate therapy. Potential liability in the cases involving bisphosphonate gives another reason why dentists need to be linked into medical information. A patient’s dentist will not be the one who prescribed a given bisphosphonate and patients often do not know the specific drugs used in prior chemotherapy, but dental treatment may very well be the trigger event to ONJ and a dentist may be first one to observe the complication.

Kidney Disease and Periodontal Disease

Fisher et al. (2008) describe periodontal disease as a risk factor for kidney disease. Craig (2008) described how “renal replacement therapy can affect periodontal tissues, including gingival hyperplasia in immune suppressed renal transplantation patients and increased levels of plaque, calculus, and gingival inflammation and possible increased prevalence and severity of destructive periodontal diseases in End Stage Renal Disease (ESRD) patients on dialysis maintenance therapy. Also, the presence of undiagnosed periodontitis may have significant effects on the medical management of the ESRD patient. ... periodontitis may be a covert but treatable source of systemic inflammation in the ESRD population.” Bayraktar et al. point out “without oral health maintenance, oral pathologies and infections could jeopardize the opportunity to receive a successful kidney transplant.”

Since kidneys are the most common transplanted organ and ESRD and kidney transplants are completely covered under Medicare, any improvement on the health of dialysis patients and transplant recipients should result in improved outcomes and reduced costs.

Public Health Improvement

Pediatric Health

In October 2008 the American Academy of Pediatricians (AAP) PEDS 21 Symposium (Pediatrics for the 21st Century) focused on oral health and “the Pediatrician’s role in Oral Health.” From AAP Highlight: “**More than 40 percent of children from families at or below the federal poverty line have tooth decay by the time they reach kindergarten. More than 52 million hours of school are lost each year because of dental problems** (our emphasis). To combat these and other problems related to dental health, pediatricians are being asked to focus on the oral health of our nation’s youth. ‘Pediatricians see young infants and children frequently for preventive health care visits, putting them in an excellent position to identify children at risk for dental health problems, coordinate appropriate care and parent education, and refer affected and high risk children to pediatric dentists,’ said Suzanne Boulter, MD, pediatrician at Concord Hospital in Concord, NH.

In 2000, the U.S. Surgeon General released the report “Oral Health in America” to raise awareness of the ‘silent epidemic’ of dental and oral disease. It concluded that **dental caries is the most prevalent infectious disease among American children** (our emphasis). While early childhood dental caries emerges within all cultural and economic pediatric populations, **oral health disparities are related to socioeconomic status and race/ethnicity** (our emphasis), it stated, ‘As a result of the Surgeon General’s report, the American Academy of Pediatrics began a push to examine children’s oral health and determine how pediatricians could become involved in addressing the epidemic,’ said Huw Thomas, B.D.S., M.S., Ph.D., dean of the School of Dentistry at the University of Alabama at Birmingham.”

Integration of medical and dental records should improve the interaction between pediatricians and dental providers. Further, improvements in health insurance integration, suggested elsewhere in this report, enabled by the integration of the clinical records, will allow the pediatric caries disparity to be addressed.

Tobacco Use Screening and Oral Cancer Prevention

Macpherson et al. (2003) stated that “a high proportion of general medical practitioners (87%) indicated they routinely made enquiries of their patients in relation to smoking habits” and yet reported only “19% of dental respondents routinely made enquiries into smoking habits, with a further 49% doing so ‘occasionally.’” Thus the dental health

professional, perhaps most appropriately in a position to do oral cancer screening, appears not to be as engaged in this aspect of health promotion, even though tobacco use is regarded as a high risk behavior for oral cancer. This may be due to many factors, including a lack of training, lack of reimbursement for cessation activities, or the assumption that cessation treatment falls only within the medical scope of practice.

The integration of health records will enable medical and dental providers to coordinate in smoking intervention and cancer screenings as well as improve the process of examining and following suspicious lesions.

Dental Provider Screening for Eating Disorders

DeBate and Tesco (2006) describe how general dentists can play a role in preventing eating disorders: the “dentist, in particular, has a uniquely important and valuable role with respect to assessment of oral and physical manifestations [of anorexia nervosa and bulimia nervosa]. ... Despite this crucial role, few dentists are engaged in eating disorder-specific secondary prevention.” The earliest signs are often oral manifestations of these disorders. Again, most dentists assume treatment falls within the medical scope but have little ability to communicate these early clinical signs and symptoms to their medical colleagues.

Integration of records allows a dentist to inform the medical providers of symptomatic indications of an eating disorder, such as unusual decalcification patterns on the teeth which suggests regular exposure to stomach acids.

Oral Hygiene and Respiratory Infections

Yoneyama et al (1996) point out the role of oral hygiene in reducing respiratory infections in “elderly bed-bound nursing home patients.” According to Scannapieco (1999), “recent evidence has suggested a central role for the oral cavity in the process of respiratory infection. Oral periodontopathic bacteria can be aspirated into the lung to cause aspiration pneumonia. The teeth may also serve as a reservoir for respiratory pathogen colonization and subsequent nosocomial pneumonia. Typical respiratory pathogens have been shown to colonize the dental plaque of hospitalized intensive care and nursing home patients.

Azarpazhooh and Leake (2006) describe the role of “aspiration pneumonia,” leading to more than 15,000 deaths per year in the U.S., with more than 200,000 cases annually, and states that “among intensive care unit (ICU) patients, those being mechanically ventilated are particularly susceptible to pneumonia.”

Integrated records would allow medical providers treating respiratory infections to include or exclude oral flora as the possible source of the infection. Such records could also lead to more knowledgeable and coordinated prevention efforts in elderly patients.

Prenatal Care, Periodontal Disease and Low Birth Weight

According to Kushtagi et al. (2008), “the association of low birth weight neonates with high health care costs and high infant mortality has been well established.” In a study of 150 women with appropriate variables controlled for, “the presence of periodontal infection was found to be significantly higher in women who delivered low birth weight neonates compared with the control group.”

Dasanayake et al. (2008) noted that nearly two-thirds of pregnant women do not receive dental care during pregnancy

Integration of medical and dental records will allow the coordination of care such that the health of the mother and fetus is not compromised by dental conditions and treatment can be applied in a timely and appropriate manner. For instance, the records will clearly show the dentist the most critical period to avoid the use of X-ray or certain medications.

Dental Providers Participating in Biosurveillance

Certain bioterrorist agents have oral manifestations that occur earlier than systemic manifestations. These oral manifestations can be used by biosurveillance software to detect disease outbreaks early. Public health officials can use this information to expedite their response. Dr. Torres-Urquidy et al. (2009) developed an early detection system that monitors for the oral manifestations of anthrax, botulism, smallpox and tularemia. Dr. Torres-Urquidy and his colleagues found that, by aggregating data from oral manifestations, it is possible for dentists to detect these outbreaks.

Standards

Within the medical informatics world, it has long been recognized that a major stumbling block to truly useful EHRs is the lack of standards. For example, it is simple for a practitioner to equate acetyl salicylic acid with aspirin. It is much more difficult for an electronic record to make the same association. Thus a standard for the concept of aspirin that acknowledges that acetyl salicylic acid is the same thing is a huge step forward. Establishing these standards is difficult. Dentistry has similar issues with the lack of standards and this is compounded by the additional need to integrate medical and dental data via standards.

As evidence accumulates to support the tighter integration of medical and dental care, the authors note a glaring gap. Nowhere in the model or in set of specifications for the health information technology (HIT) standards harmonization, is it clearly and explicitly stated that national HIT standards harmonization should incorporate provisions for medical-dental collaboration. This suggests that the HIT standards harmonization process serves the obsolete model of healthcare with different medical and dental data streams. Dr.

Titus Schleyer, a dental informatics professor at the University of Pittsburgh School of Dental Medicine noted in 2004 that the shortsighted focus on only the medical domain in setting the health information technology standards will lead to ignorance of the need to account for dental care to the detriment of the patient. Leadership from HHS/ONC, is required to resolve this.

A manifestation of Dr. Schleyer's fear appears in the 2005 Role-based Access Control (RBAC) document "HL7 Healthcare Scenario Roadmap - Licensed Healthcare Providers". This document contains specifications for role-based capabilities that are built upon the traditional view of the health professions. Dr. Franklin Din reviewed this document and reported concerns about the criteria used for identifying only two categories of dental provider for the matrix. Further, dental providers (dentists and oral surgeons) routinely prescribe medications. A system based on this matrix would prohibit dentists and oral surgeons from entering prescriptions (the role-based activity is to create a Medication Administration Record or MAR) into the EHR. In this model, a dental provider could not update the patient's medication record when prescribing a medication. Fortunately, this document does not represent an accepted standard, but vigilance must be maintained so that such specifications are never adopted as a standard.

Discrepancies in Medical Information between Medical and Dental Records

The Department of Defense (DoD) has been aware since 1977 that as many of 10% of dental records of active duty personnel could have discrepancies when compared with their medical records (Lewis et al., 1977). In a group of 100 randomly selected active duty personnel at Walter Reed Medical Center, "eleven discrepancies of major medical significance were found." Discrepancies between medical and dental records are due largely to the reliance upon patient self-reporting of treatment in the other discipline, rather than on an integrated electronic record system. Selzer and McDermott (1999) reported that "of patients who completed the same medical history questionnaire twice within a certain time period, 66% had at least 1 significant omission in their history."

According to Lutka and Threadgill (1995), "medical history questionnaires and outpatient medical records of 115 patients were compared. All patients had a medical history of at least two years in both records. The dental records were initially reviewed, and patients' responses were compiled; when these were compared with the outpatient medical records, the overall discrepancy rate was greater than 86 percent. This overwhelming rate of error should make dentists aware that many routinely treated patients have medical conditions that are unknown to providers.

The potential for problems caused by this lack of information, incorrect information, and conflicting information should be obvious. In fact this is a problem even in a solely paper-based world. The only reasonable solution is the integration of medical and dental records so that there is no missing information.

Cross Discipline Education

In a 1995 study, *Dental Education at the Crossroads: Challenges and Change*, the Institute of Medicine (IOM) had already recommended closer integration of dentistry with medicine and the health care system as a whole: This IOM report predicted that scientific and technological advances in molecular biology, immunology, and genetics, along with an aging population with more complex health needs, would increasingly link dentistry and medicine, leading to the need for changes in dental education. As physicians come to see oral health as a legitimate domain of involvement for their profession, and dentists acquire better understanding of the systemic implications of oral disease, asking the right questions will be as much a matter of perspective as of knowledge and skills. Cultivating such a perspective will require significant change in the curricula of both professions.

Hein (from Scottsdale Project) states that “in spite of the growing acceptance within the dental community, it cannot be assumed that the medical community is aware of the research to support the effect of periodontal disease on local and systemic inflammation” (Hein, 2007).

Thus, in addition to integration of records, there is a need to sensitize the medical community to the dental contribution to systemic health and a converse need to sensitize the dental community to dental contribution to systemic health. The simple recognition of the importance of the other side to overall health is a big step toward acceptance of the integration of medical and dental records.

Separate Insurance Silos and Their Impact

The traditional separation and distinction between medical care and dental care is reflected and reinforced in the separate insurance realms (medical vs. dental insurance). This complicates the coordination of care and insurance coverage. A more coordinated approach should yield significant improvements in patient and public health outcomes like, (a) formally connect the relationship between systemic (medical) and oral (dental) health care streams, (b) reduce disparities of coverage of unserved and underserved populations, (c) better support performance measure assessment and biomedical research. The separate insurance frameworks (medical insurance, dental insurance) in health care are a significant barrier to integration of the clinical records. Ideally, these two insurance silos can be merged into a single health insurance framework, with appropriate attention to (a) the interrelationships between systemic (medical) and oral (dental) health care, including a common terminology to ensure semantic consistency, (b) disparities of coverage, and (c) foundations for performance assessment and biomedical research.

In the case of Medicare, the silos result in a complete exclusion of coverage for dental services, except “extractions done in preparation for radiation treatment for neoplastic diseases involving the jaw,” and “oral examinations, but not treatment, preceding kidney transplantation or heart valve replacement.” (CMS, 2005). The legal barrier to treatment in this case is: “Section 1862 (a)(12) of the Social Security Act, which states,

‘where such expenses are for services in connection with the care, treatment, filling, removal, or replacement of teeth or structures directly supporting teeth, except that payment may be made under part A in the case of inpatient hospital services in connection with the provision of such dental services if the individual, because of his underlying medical condition and clinical status or because of the severity of the dental procedure, requires hospitalization in connection with the provision of such services.’” (CMS, 2005)

This is a direct barrier to providing important routine and preventive oral healthcare to those served by Social Security and impacts the maintenance of systemic health of these individuals.

Recommendations

Our Community Discussion group (a list of attendance appears in Appendix A) has agreed to a set of 12 recommendations that will address the integration of medical and dental records to the benefit of all. In detail they are:

1. Analyze, identify, and plan to resolve the discrepancies in shared medical and dental data. Haughney et al. (1998) reported 99 discrepancies between medical and dental records for 178 joint patients. Six of these discrepancies were classified as “**life-threatening**.” (our emphasis)
2. Study the communication model practices (or lack of them) in existence. Establish a model with both medical and dental input that can be used across the spectrum of patient care. Sources of experience include, but are not limited to Wisconsin Diabetes Guidelines, Marshfield Clinic, University of Detroit Mercy, IHS, VHA and U.S. Military AHLTA health care systems. The ideas from these sources need collaborative review and refinement. The breakdown in communication across medical and dental providers for a patient cared for in both silos is a major stumbling block to improving chronic care outcomes.
3. HHS/ONC should continue leadership with regard to the integration of medical and dental care and data especially as it relates to NHIN standards. AHIC 2.0 needs include medical / dental integration issues in its work on use cases which will then be submitted to HITSP for design of the technical details work. It should be explicitly stated that the NHIN integrates both medical and dental records and care.

4. Evaluate Certification Commission for Healthcare Information Technology (CCHIT) standards to determine if changes and explicit acknowledgement of the importance of oral healthcare for systemic healthcare are needed. Similarly HIT products should be evaluated (if necessary, reevaluated) with respect to their suitability according to any updated certification and the interoperability between EHRs and EDRs.
5. Analyze medical and dental insurance plans for their contribution to the continuing separation of medical and dental treatment. Where barriers to the integration of medical and dental records are the result of the insurance process, changes are necessary. Specifically, the oral care requirements of patients with medical problems need to be represented within the medical and dental insurance benefit programs. An integrated health care insurance strategy that meets national needs so that the claim streams can be merged.
6. Support and fund the terminology work necessary to ensure semantic interoperability of the data between medical and dental domains, i.e. when data is exchanged, the meaning is the same for the sender and the recipient. Adherence to ANSI/ADA Specification 1000 and other applicable data standards is required.
7. Strongly encourage standards organizations, such as HL7 and HITSP, to embark on efforts to assess what adverse impact, if any, has occurred in standards development thus far because of the separation of medical and dental data and care delivery.
8. Design incentives to encourage the training of additional dental informaticists. The integration of medical and dental records can only be accomplished with trained dental informaticists who understand the complexities of the effort leading the effort. The total number of trained dental informaticists is less than 30. Training opportunities should be open to dental auxiliaries.
9. As the AAMC and ADEA both recommend, move forward with modifications to medical and dental education (both pre-graduation and continuing) to assure that providers can deliver the best care that integrates the use of combined information systems for oral and systemic health. Add informatics and IT training to expose the students to the reality that informatics and IT are now integral to clinical practice.
10. Amend the Social Security Act of the U.S. to include provision for routine and preventive oral healthcare (dental care) as an integral part of systemic healthcare and as a model for the cost-effective application of coordinated care that will then be adopted by private insurers. In most cases, there is currently no dental coverage for patients whose medical problems include dental co-morbidities.
11. Deal with liability concerns of providers and privacy concerns of patients with regard to EHR/EDR adoption and use of networks and registries. Network liability issues can be addressed by legislation like West Virginia §16-29G-5: Immunity from suit; limitation of liability. One of the major concerns of practitioners is the issue of liability when using shared data and responsibilities

regarding data security. Until these issues are addressed, it is unlikely that practitioners will voluntarily exchange health records.

12. Facilitate affordable Electronic Health Record (EHR) / Electronic Dental Record (EDR) adoption. A clear and unambiguous statement on how a software provider, clinic, hospital, insurance company, etc. may be able to help fund the adoption of EHR/EDR without violating Stark is necessary.

Conclusion

The link between oral health and systemic health cannot be denied. The separation of dental and medical is no longer defensible or sustainable in modern healthcare. The only question is how and when to resolve this problem. We have presented the case for integration as well as the supporting evidence. The core need, the foundation for success, for achieving the integration of the clinical practices is the integration of the records. Dental records must integrate with medical records and medical records must accommodate the needs of dental providers. This extends to all applications, architectures, standards, and advance functions envisioned in an interoperable healthcare environment. Focus on this specific goal will help drive the others, like improving health insurance to become more holistic in benefit application.

A fully referenced position paper on this topic is available.

The Hydra can be beaten.

This report represents a common agreement among all the signatories, which appear in Appendix A. We stand ready to help the Obama administration, Secretary Daschle, and Congress achieve these goals.

Individual Concurring Support Statements

Leslie A. Best, Chronic Disease Director, Pennsylvania Department of Health

Summary

- Oral diseases are progressive and cumulative and become more complex over time. They can affect our ability to eat, the foods we choose, how we look, and the way we communicate. These diseases can affect economic productivity and compromise our ability to work at home, at school, or on the job.
- New research is pointing to associations between chronic oral infections and heart diseases, stroke, low birth-weight, and premature births. Associations between periodontal disease and diabetes have long been noted.
- Use of tobacco products can substantially increase risks for oral cancers.
- Fluoride protection and dental sealants remain effective preventive measures.
- Nutrition is important to good oral health and to prevention of chronic disease. Poor nutrition through the consumption of refined sugars, sugar-sweetened beverages, and acidic soft drinks can contribute significantly to dental caries and obesity, as well as osteoporosis.
- The nation is facing a serious shortage of dentists in the foreseeable future.
- The number of dentists participating in the Medical Assistance Program remains low; this is a critical access issue, as 80% of the disease is seen in 20% of the population, the lower income population.
- Access to care is a critical barrier to overall oral and physical health. As people lose their jobs, they lose health coverage, and payment for preventive dental care is ignored.

Recommendations

- Increase funding for state oral health programs, so that each state can implement evidence based programs to prevent oral diseases in children and early detection of oral cancer in tobacco users.
- Enhance statewide funding for effective prevention programs, such as school-based dental sealant programs.
- Fund and support national, state and local initiatives to increase community water fluoridation.
- Explore realistic incentives for dentists to increase provider enrollment in Medical Assistance Programs and Children’s Health Insurance Programs.

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Appendix A

List of participants and bios where available

1. Miguel Humberto Torres-Urquidy, DDS, MS, Researcher, University of Pittsburgh

Dr. Torres-Urquidy is member of the Center for Dental Informatics at the University of Pittsburgh. He is currently developing communication standards for exchanging clinical data among dentists. He is also leading a project that seeks to understand dentists' use of data when diagnosing and treating patients at the University of Pittsburgh. His masters' project created a biosurveillance system that uses oral manifestations. Additionally, he has worked analyzing public policy while at the National Institutes of Health and privately has worked as technology consultant in healthcare and other industries. He has articles published in several major dental journals and has served as reviewer for the Journal of the American Dental Association and the American Dental Education Association (ADEA). For ADEA, he also served in the presidential committee on Dental Vocabularies and Terminologies.

2. Dr. Frederick C. Eichmiller, VP and Science Officer, Delta Dental of Wisconsin

Dr. Eichmiller is a graduate of the University of Minnesota with Degrees in Dentistry and Mechanical Engineering. He was in private practice for five years and has had dental teaching assignments at the University of Minnesota, the University of Texas San Antonio, the University of Washington Seattle, Howard University in Washington, DC, and the Navy Dental School in Bethesda, MD.

Prior to joining Delta Dental of Wisconsin in the fall of 2006, Dr. Eichmiller served for eight years as Chief Clinical Research Scientist and twelve years as Managing Director of the American Dental Association Foundation's Paffenbarger Research Center, a dental research enterprise operated by the American Dental Association's Foundation. The center, located in Gaithersburg, Md., engages in cooperative dental and medical materials research with government scientists and others, helping to develop standards, treatments, instruments and materials used by dentists nationwide. Dr. Eichmiller has published an array of academic papers and twelve patents reflecting research on dental restorative materials and other topics. He serves on numerous panels and committees for the National Institutes of Health, the International Standards Organization, and the American National Standards Institute. Dr. Eichmiller serves on the editorial review panels for the Journal of the American Dental Association, The Journal of Dental Research, Operative Dentistry, The

American Journal of Dentistry, The Journal of Dentistry, and as assistant editor to The Journal of Biomedical Materials Research.

3. John L. Zimmerman, DDS, Assistant Dean for Information Resources, Associate Professor of Clinical Dentistry, Associate Professor of Biomedical Informatics, Associate Director, Columbia Center for New Media Teaching and Learning, Columbia University

Dr. John L. Zimmerman has extensive training in dental informatics, educational innovation, and administration. Dr. Zimmerman received his DDS degree in 1980 from Temple University Dental School and he is presently Assistant Dean for Information Resources at Columbia University's School of Dental and Oral Surgery, Associate Director of the Columbia Center for New Media Teaching and Learning, and Assistant Professor in both the School of Dental and Oral Surgery and the College of Physicians and Surgeons (in the Department of Biomedical Informatics). Dr. Zimmerman is an elected member of the American College of Medical Informatics and has worked with numerous professional and government organizations including The World Health Organization, Oral Health Division. In addition to teaching courses and guest lecturing, Dr. Zimmerman oversees the design and management of the dental school's clinical information systems, directs the development online educational programs at the Columbia University health science schools, and is principle investigator for a Department of Education grant on personalized learning plans, e-portfolios, and blended learning (distance education technologies blended with traditional classroom learning) for postdoctoral residency training programs. Dr. Zimmerman is editor of the textbook, *Dental Informatics – Integrating Technology into the Dental Environment*, and has published numerous articles in biomedical informatics.

4. Arden W. Forrey, PhD, Dept of Restorative Dentistry, University of Washington School of Dentistry

Arden Forrey received a baccalaureate degree in Chemistry from the University of Washington in 1955 and served two years as an officer in the US Navy Destroyer Force in Norfolk VA. He began his Biochemistry PhD work in 1957 with a degree in 1963. In 1964-65 he was a postdoctoral fellow with Prof S. V. Perry in the Dept of biochemistry University of Birmingham, UK. In 1966 he became Biochemist in the Clinical Research Center Harborview Medical Center where he became involved in the application of informatics to patient care and transferred in the US Naval Reserve from Line to Medical Service Corps from which he later retired in 1983 but served non-pay in a Fleet Hospital until 1993 working on Combat Casualty uses of Electronic Health Records - EHRs. From 1983-1991 he was a fellow in the UW School of Medicine Dept. of Surgery applying the EHR concepts from the military settings to Emergency Medicine. From 1991 - present he became an adjunct faculty in the UW - SOD Dept of Restorative Dentistry in order to apply EHR

concepts to oral health. In 1984 he also helped found the AACC's Lab Information Systems and Medical Informatics Division in order to relate clinical laboratory information to the EHR.

5. Joanna C. Baker, MSPH, MT(ASCP)cm SC C QPOCTE

Ms. Baker is the Laboratory Information Officer at Moncrief Army Community Hospital, Ft. Jackson, SC. She has a Master's in epidemiology as well as certifications with ASCP. She has worked in the medical lab for 43 years with almost 41 being with DoD. With one of her sons being an IT specialist and her other son and his wife being dentists, her family reportedly lives the medical/dental IT challenges daily. She reports being the rising AACC LISMI division chair.

6. Dr. Leslie A. Best, Chronic Disease Director, Pennsylvania Department of Health, Harrisburg, PA

7. Shaun C. Shakib, MPH, Medical Informaticist, 3M Health Information Systems, Inc.

Shaun Shakib is a medical informaticist with over ten years of experience and formal training in laboratory science, public health, and biomedical informatics. His areas of experience and technical expertise include knowledge engineering, clinical terminology, vocabulary server design and implementation, and health information exchange. He is an active member of national/international medical informatics and standards organizations, including Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT), Health Level 7 (HL7), Logical Observation Identifiers Names and Codes (LOINC), American Medical Informatics Association (AMIA), and Healthcare Information and Management Systems Society (HIMSS).

He has facilitated communication among and managed clinicians and programmers in research and development projects, including the authoring of medical and dental information models and vocabulary server design.

Shaun authored a comprehensive dental information model in a two year project working with multiple subject matter experts from the US Department of Defense. The detailed model covered the following specialties in military dentistry: comprehensive dentistry, periodontics, prosthodontics, orofacial pain, oral maxillofacial surgery, maxillofacial prosthodontics, dental laboratory, endodontics, and orthodontics. In addition to the model a supporting dental lexicon was produced and in conjunction with the Clinical LOINC committee many new standard LOINC terms were created for Dentistry.

8. Justin Starren, MD, PhD, FACMI, Director, Biomedical Informatics Research Center, Marshfield Clinic Research Foundation, WI

Justin Starren, is the Director of the Biomedical Informatics Research Center and Associate Medical Director for Informatics at the Marshfield

Clinic. He is Assistant Director for Informatics of the University of Wisconsin Institute for Clinical and Translational Research, Visiting Associate Professor of Medical Informatics at University of Wisconsin, Madison, Adjunct Associate Professor of Clinical Biomedical Informatics at Columbia University, and serves on the Wisconsin eHealth Care Quality and Patient Safety Board. He received his BA, MD and a Masters in Immunogenetics from Washington University in St. Louis, and was the first PhD candidate in medical informatics from Columbia University. He is a fellow of the American College of Medical Informatics and has presented to Congressional staff on issues of Privacy, Telemedicine and Electronic Health Records. His research focuses on making health care information technology more usable by clinicians and patients. This has included work in Human Computer Interaction; development of interoperability standards; Regional Health Information Networks; Home Telemedicine, Remote Monitoring; and, Clinical Research Informatics.

9. Herbert James Ong, BSpH, MBA, President and CEO Dental-Medical Analytics Corp (DMAC)

An experienced executive leader with over 20 years experience in the health care technology industry, Herbert Ong has developed significant expertise and leadership in the advancement of healthcare software and informatics. As President and CEO of DMAC, a leading source for dental-medical intelligence, Herbert is particularly known for his expertise with regards to the relationship between dental and medical informatics as well as the relationship between software and informatics.

Herbert has a broad background and field experience in executive management, partnerships, business operations, strategic marketing, and product management with the entire suite of technology solutions gained from working for companies such as Thomson Reuters, IBM Global Services, Philips Electronics, Medibuy (now Global Health Exchange), and Cerner Corporation.

Herbert Ong has a Bachelor of Science in Pharmacy from the University of British Columbia and a Masters in Business Administration from Simon Fraser University.

10. Mureen Allen, MD, MS, MA, FACP, Medical Director, Clinical Research and Development, Active Health Management

Mureen Allen, M.D., is a medical director with ActiveHealth Management, a technology company that uses clinical decision support tools to improve clinical care. Her activities include the development of clinical rule sets for performance measures and clinical care, development of economic models of savings for the proposed rules, and advising senior management about the current health information technology environment. Dr. Allen serves as co-chair of the Consumer Perspective Technical Committee of the Health Information Technology Standards Panel (HITSP). Dr. Allen holds an academic appointment at Robert Wood

Johnson Medical School (Clinical Assistant Professor of Medicine) and is a Fellow of the ACP. She is board-certified in internal medicine, has a research master's degree (M.A.) in Biomedical Informatics from Columbia University, New York, and has a master's degree (M.S.) in Technology Management from Marshall University (Huntington, West Virginia).

Prior to ActiveHealth, Dr. Allen was the senior associate for informatics and practice improvement at the American College of Physicians (ACP). In this capacity, she provided recommendations to the executive staff of the ACP on a wide range of issues related to the healthcare information technology domain including public policy and advocacy. Dr Allen's major interests include public policy and advocacy, strategies for electronic health records development and deployment, emerging technologies, electronic prescribing, and quality improvement.

11. Susan Johnson, Director, King County Health Action Plan Public Health - Seattle & King County, WA

Susan Johnson is a Regional Health Administrator and Director of the King County Health Action Plan (KCHAP), a voluntary partnership of over forty organizations convened by Public Health - Seattle & King County, and which includes representatives from all levels in the health care field from managed care organizations, community clinics and hospitals to business, labor, consumer and community groups and county and state governmental agencies. The mission of the KCHAP is to implement innovative collaborative policy development and pilot projects that focus on system change and improvement of worsening health trends affecting vulnerable populations within King County, Washington. Some of its largest programs are The Children's Health Initiative, (a \$6m public/private program), Kids Get Care, the Children's Health Improvement Collaborative and SeaTac Smiles.

Before assuming these duties in May of 1997, Susan was a member of the Washington State Health Care Policy Board, appointed by Governor Lowry in 1995, and prior to that was the state governmental relations director for the Service Employees' International Union, then, the largest health-care union in the AFL-CIO.

Susan has served as a member of the Board of Directors of the Northwest Physicians Health Improvement Foundation, and was appointed to the State Board for Community and Technical Colleges and the Shoreline Community College Board of Trustees. In past years she was on the steering committee for the State Public Health Improvement Plan and was a member of the Long-Term Care Advisory Committee to the former Washington Health Services Commission. Susan graduated from Middlebury College, Vermont.

12. Michael J. Kowolik, BDS, PhD, Associate Dean for Graduate Education, Professor and Director of Graduate Research, Indiana University School of Dentistry

Dr. Kowolik obtained his B.D.S. and PhD from the University of Edinburgh, Edinburgh, Scotland. His interests are in basic and applied studies of inflammatory cell function, clinical studies of inflammatory disease, including genetics, oral - systemic disease associations and clinical models, helicobacter pylori transmission and the oral cavity, and clinical, global and ethical issues in research.

13. Lynda J. Davidson, Ph.D., RN, Dean, School of Nursing and Health Sciences, Robert Morris University
14. Barbara J. Levine, Ph.D. Dean, SCIS and Associate Professor of Communications School of Communications and Information Systems, Robert Morris University
15. Angela Macci Bires, Ed.D., M.P.M., R.T.(N), CNMT, Department Head, Nuclear Medicine Technology; Associate Professor of Nuclear Medicine Technology, Robert Morris University
16. Michele Schmidt, Institutional Advancement, Robert Morris University
17. Lynn Gaydosik, Coordinator, DNP & Nuclear Medicine Technology Programs, Robert Morris University
18. Mary Young, RDH, MHA, Assistant Executive Director, Institute for Oral Health
19. Matt Holder, MD, MBA, CEO, Underwood and Lee Clinic, Louisville, KY
20. Wendy E. Mouradian, MD, MS, Associate Dean for Regional Affairs, Director, Regional Initiatives in Dental Education (RIDE), Professor of Pediatric Dentistry, Pediatrics, Dental Public Health, Sciences and Health Services (Public Health), University of Washington School of Dentistry
21. Brian L. Mealey, D.D.S., M.S., Graduate Program Director, Department of Periodontics, University of Texas Health Science Center
22. Kenneth F. Chenosky, Oral Health Program Administrator, Division of Health Risk Reduction, Pennsylvania Department of Health
23. Franklin Din, DMD, MA, Senior Informatics Consultant, Apelon, Inc.

After over twenty years of clinical dental experience and three years of academic teaching experience, Frank completed an NLM post-doctoral fellowship in Biomedical Informatics at Columbia University in 2005. He is currently a Senior Informatics Consultant for Apelon, Inc. His path into Informatics and Terminologies began with recognition, as a clinician, of the inadequacies of paper-based patient records. He created tools, in PC and Palm versions, that provided decision support on medical conditions and their affect on dental treatment. In response to the World Trade Center attack of 2001, as an NDMS/DMORT (National Disaster Medical System / Disaster Mortuary Operational Response Team) forensic dentist, Frank modeled and developed a database to track the status of antemortem

and postmortem dental records, as well as provide an audit trail for the chain of custody for the records. For the Hurricane Katrina recovery in 2005, he separated the dental identification unit from the dental data gathering unit in the morgue. While at Columbia University, Frank developed a search and subset tool for SNODENT. In addition, he led a three student team which prototyped personalized health information delivery via cell phone text messaging in order to reach the mobile minority teen population. Prior to joining Apelon, Frank worked as a Terminology Analyst for the Veterans Health Administration (VHA) in the Enterprise Terminology Service group. He created a tool to conduct mappings between concepts in the VistA etiology files and SNOMED CT for the LDSI (Lab Data Sharing Initiative) project that links the VHA and the Department of Defense lab systems. In addition, he created an MS Excel tool to conduct a mapping from the Kaiser Permanente ICD-9 based problem list into a SNOMED CT based list. This work became the basis of the FDA's SPL problem list. Frank serves as the lead in developing collaborative work in knowledge discovery with the Ohio State University Department of Biomedical Informatics and Clinical and Translational Research Center as well as improving the extraction of the analytic data from OSU Medical Center's Information Warehouse. Frank currently serves as co-chairman the HITSP Education, Communication, and Outreach Committee's planning workgroup.

24. Valerie Powell, RT(R), PhD, University Professor, Computer & Information Systems, Robert Morris University

Dr. Powell has over 26 years experience in medical informatics, most of it involving the Department of Veterans Affairs (VA) and the Indian Health Service. She credits her interest in integration of health care systems to her collaboration in the early 1980s with Dr. Charles J. Austin, who authored textbooks on hospital information systems and taught health administration. More recently she has been involved in radiologic informatics, serving on the Imaging Education Committee of the Association for Educators in Imaging and Radiologic Sciences (AEIRS). She serves as Education and Training Chairwoman for WorldVistA, a non-profit organization. Now in her 50th year of teaching, she teaches networks and routing, information security, advanced medical computing, and discrete mathematics. She has been invited to lecture or provide technical input abroad on health care informatics topics in Germany, Mexico, Japan, Austria, and Canada. She has hosted a number of conferences on electronic health records (EHRs). Because of her extensive involvement in health care informatics, Governor Ed Rendell appointed her to the Pennsylvania Governor's Commission on Chronic Care Management, Reimbursement, and Cost Reduction in 2007. Dr. Powell's software standards experience: member, X3/DBSSG (Database Systems Study Group), member, NCITS/T3, Telecommunications, chair, NCITS/J21, Model-Based Formal Specification Languages, a committee with US Technical Advisory Group responsibility for ISO standards.

Additional Contributors

25. Mary Korytkowski, MD, U of Pittsburgh Diabetologist
26. Robert J. Collins, DMD, MPH, Director, Division of Community Oral Health
Director, Office of International Relations, University of Pennsylvania School of
Dental Medicine
27. Wolfgang Giere, Dr. med. (retired) director of the Medical Informatics Center at
the University of Frankfurt/M Germany

Appendix B

Responses to Questions about Personal Involvement with the Healthcare System

1. Briefly, from your own experience, what do you perceive is the biggest problem in the health system?

Mureen Allen –

I think there are a number of problems in healthcare. Probably the biggest is access, even patients with insurance find it difficult to get into see a physician for routine care and if they are really ill they end up in the emergency room. The current health system is geared to reimbursing the specialist and reimbursing for procedures and routine healthcare is minimized. The consequence is that there are insufficient primary care physicians who are the basic building blocks of the healthcare system. Another issue is a general lack of emphasis on preventive services - this should be a national priority, we know that it is more cost effective to prevent obesity, to promote an active lifestyle, and to promote a healthy lifestyle but we only pay lip service to these issues nationally and politically.

Joanna C. Baker -

The biggest problem is access to health care when acutely needed, i.e . you get an appointment months into the future. This is driven by possession of the “right” insurance or any insurance.

Susan Johnson –

The system is not "a system" in that the individual has to "connect the dots" often with the use of a "navigator" thus creating each time one's own system. Too often the dots refuse to connect as in access to specialty care for Medicaid insured or access to any primary care for the uninsured. A "system" that relies on luck and location is not a system of stability and predictability.

Franklin Din –

I used to believe that market forces would solve most problems and ultimately reduce costs. Since my employer has moved to a high deductible plan (supposedly this promotes market-based medical decisions) with a Medical Savings Account. I quickly discovered the flaws with this system. Medical care is not something that is amenable to cost comparison. You cannot get every fee for every service from every potential practitioner. Further, the notion that a patient can make a informed decision on medical issues is false. Medical care is too complex for any lay person to truly make an informed decision. Lastly, trying to

bargain a fee with hospital or practitioner is unprofessional places patient and practitioner in adversarial positions. Doctor and patient as adversaries is not conducive to healthy outcomes.

Valerie Powell –

Lack of integration of care and records, not just with regard to medical and dental care. Problems with discrimination against patients in certain groups. Health care professionals do not have adequate training in diversity, although they claim they do. When you're in the hospital they won't always let you know your test results, making excuses about regulations, even if you would benefit from the data for self-management. Diets served in some hospitals don't always match diagnoses.

When I look at the documentation for charges on the provider/hospital end and the adjudication process on the payer/HMO end, the complexity and details of the process doom it to errors, challenges of interpretation, inefficiency, delay, and processing costs. Add code-shifting behaviors and it gets even worse. There should be serious research to identify an improved strategy for paying for/reimbursing health care costs.

2. How do you choose a doctor or hospital? What are your sources of information? How should public policy promote quality health care providers?

Mureen Allen –

Referrals from friends. Check the licensing board. I'm not certain how you would define "quality" healthcare providers. I think that the current policy of using quality / performance measures to evaluate providers is misguided.

Joanna C. Baker -

I choose a doctor or hospital by their competency and rating, i.e. injuries go to a level 1 trauma center- medical issue choose a doctor who is recommended by other doctors for their competency, i.e. ask a trusted pathologist who he or his family would use.

Susan Johnson –

I use word of mouth and referrals from trusted colleagues in the medical field. "Report cards" that can be shared publicly are a good source for comparative "shopping."

Franklin Din –

I recently moved to an area where I knew no one and had to quickly establish a physician – patient relationship because I am a post-transplant patient. Asking a neighbor was not a good way to find a doctor. I would have preferred a central source to examine potential practitioners, their experience, quality assessments, and fees, but none exists. I essentially was reduced to selecting a primary care physician via location and

insurance acceptance. Only through trial and error was I able to establish a comfort level with my current providers.

Valerie Powell –

Ask nurses and doctors, as they know best. I get care in a hospital in which I worked after a serious adverse incident in a different hospital.

3. Have you or your family members ever experienced difficulty paying medical bills? What do you think policy makers can do to address this problem?

Joanna C. Baker –

Yes, my son had a student health policy which had in the “small print” would not cover strep throat or mono. He had both at the same time and was placed in the hospital. Not only was his treatment not covered, but we had to pay a higher price than persons who had regular insurance was paid to the hospital or the doctor.

Valerie Powell–

Yes, when I was a student I couldn’t afford health care. A universal health care plan would solve this kind of problem.

4. In addition to employer-based coverage, would you like the option to purchase a private plan through an insurance-exchange or a public plan like Medicare?

Joanna C. Baker –

I have employer based coverage which is Federal Blue Cross/Blue Shield as well as Medicare because I am almost 68 years old. Over the years Federal benefits have decreased drastically and because I am still employed by the government I have to pay an additional Medicare Tax. My Medicare part B costs 298.00 for 3 months. Between Federal Blue Cross/Blue Shield, Medicare, and Medicare Tax; my health insurance costs me approximately 375-400.00 a month out of my pocket. Additionally, the costs of co-pay and deductibles have increased. Government funded health care is not what the general public and the politicians think. All the politicians for the most part are wealthy. Congress has a better deal than the regular government worker.

Susan Johnson –

I think the system needs to migrate away from a dependence on being an employer-based system.

Valerie Powell –

We should get away from employer-based coverage as long as the replacement provides care as good as I am getting now.

5. Do you know how much you or your employer pays for health insurance? What should an employer’s role be in a reformed health care system?

Joanna C. Baker –

Yes, approximately half, but as you see by the above what I pay would be out of sight for the regular worker.

Susan Johnson –

Yes. An employer can be a purchasing broker within associated groups and can push for wellness and prevention focused purchasing.

Valerie Powell –

We should get away from employer-based coverage as long as the replacement provides care as good as I am getting now. Our employers in certain business categories can't compete internationally.

6. Below are examples of the types of preventive services Americans should receive. Have you gotten the prevention you should have? If not, how can public policy help?

Joanna C. Baker –

Yes. At least for the most part this is paid for.

Susan Johnson –

Public policy can reward prevention and the ability for costs savings to be drawn back into the system

Valerie Powell –

Yes, but often only with difficulty because self-management in public situations requires a lot of effort. Encourage and/or incentivize restaurants, sports stadiums, movie theaters, other public venues where only salty, sugared food choices are available from vendors and machines to make appropriate choices available, educate public about choices for various disease states, add accurate phosphorus levels for consumer who have kidney disease; periodically check potassium (K) and other levels in labeling in grocery stores (I have found gross inaccuracies). Find incentives to encourage healthier food choices, especially with regard to carbohydrate and sodium (Na) content. Health club memberships should be encouraged.

Not all airlines serve water in a manner consistent with the needs to stay hydrated, a circumstance aggravated by prohibiting passengers from taking beverage containers on board due to security needs.

7. How can public policy promote healthier lifestyles?

Mureen Allen –

Referrals from friends. Check the licensing board. I'm not certain how you would define "quality" healthcare providers. I think that the current policy of using quality / performance measures to evaluate providers is misguided.

Joanna C. Baker -

Emphasize less fast foods, no unsafe sex, no tobacco and less alcohol consumption—every thing we have been told, but the public refuses to do.

Susan Johnson –

As above, public policy can promote purchasing for prevention that saves money and promotes healthy lifestyles within a workforce.

Valerie Powell –

Encourage and/or incentivize restaurants, sports stadiums, movie theaters, other public venues where only salty, sugared food choices are available from vendors and machines to make appropriate choices available, educate public about choices for various disease states, add accurate phosphorus levels for consumer who have kidney disease; periodically check potassium (K) and other levels in labeling.

Responses to Participant Survey Questions

1. What do you perceive is the biggest problem in the health system?

Mureen Allen, Miguel Humberto Torres-Urquidy -

Lack of emphasis on prevention

Joanna C. Baker, Susan Johnson, Franklin Din –

Cost of health insurance and cost of health care services

Valerie Powell –

Lack of preventive care approach, lack of use of and reimbursement for multidisciplinary teams, as advocated in chronic care strategies. Difficulty for patients to regulate their own diets in restaurants, sports stadiums, movie theaters, other public venues where only salty, sugared food choices are available from vendors and machines, thus constantly undermining patient self-management strategies.

2. What do you think is the best way for policy makers to develop a plan to address the health system problems?

Mureen Allen, Miguel Humberto Torres-Urquidy -

Community meetings like these

Joanna C. Baker –

Community meetings like these, Surveys that solicit ideas on reform, A White House Health Care Summit

Susan Johnson –

Community meetings like these, A White House Health Care Summit, Congressional hearings on C-SPAN

Valerie Powell –

Community input such as is occurring here.

3. After this discussion, what additional input and information would best help you to continue to participate in this great debate?

Mureen Allen –

More information on solutions for health reform

Miguel Humberto Torres-Urquidy -

More opportunities to discuss the issues

Joanna C. Baker –

More information on solutions for health reform, More stories on how the system affects real people

Susan Johnson -

More specifics and potentially regional approaches that can get us to total reform over time.

Valerie Powell –

Research into correspondence/discrepancies between medical and dental records for same patients.