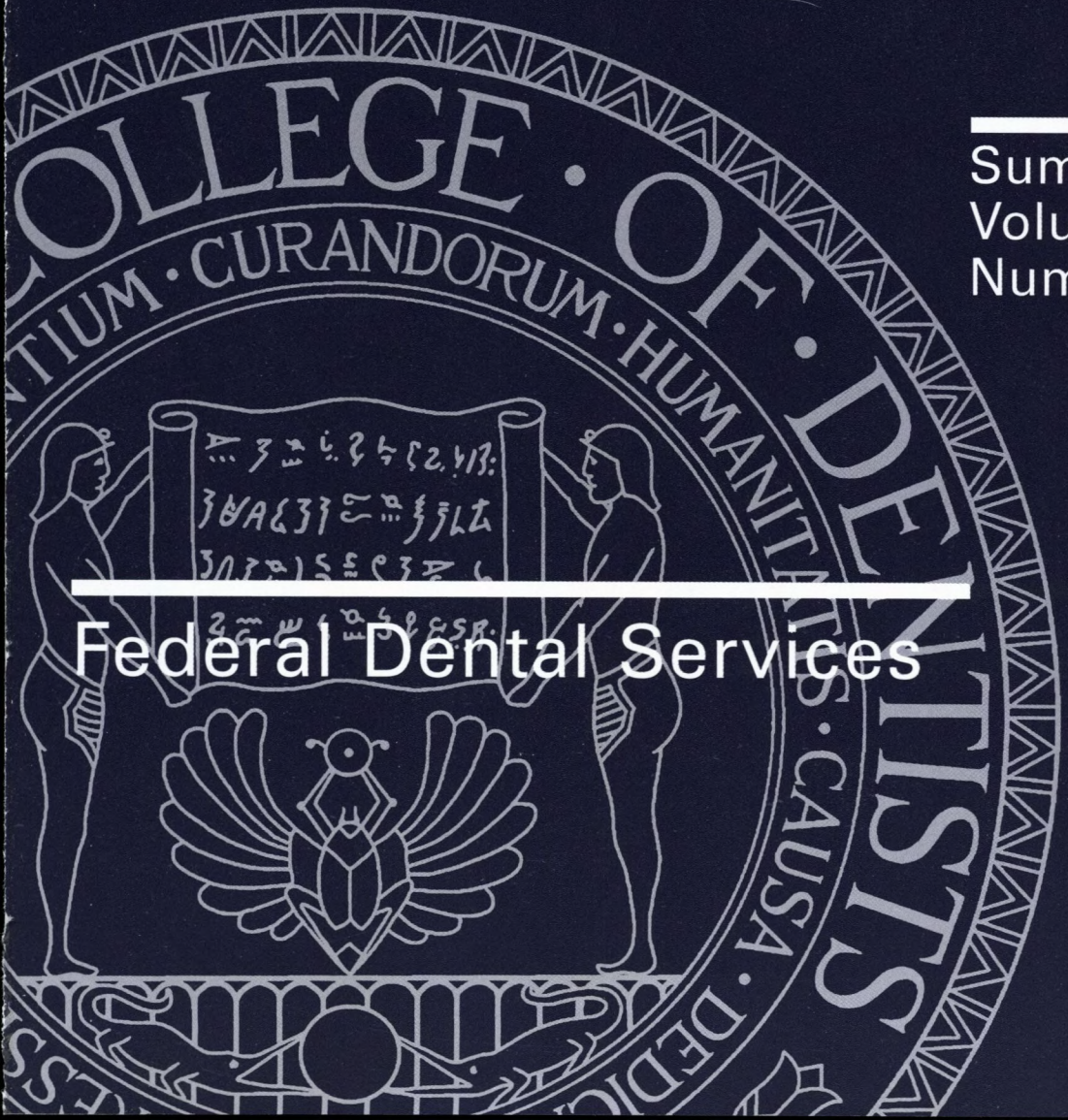
Journal of the American College of Dentists

Summer 2003
Volume 70
Number 2



Federal Dental Services

Journal *of the* American College *of* Dentists

A Publication Presenting Ideas, Advancements, and Opinions in Dentistry

The *Journal of the American College of Dentists* (ISSN 0002-7979) is published quarterly by the American College of Dentists, Inc., 839J Quince Orchard Boulevard, Gaithersburg, MD 20878-1614. Periodicals postage paid at Gaithersburg, MD.

Postmaster: Send address changes to:
Managing Editor
Journal of the American College of Dentists
839J Quince Orchard Boulevard
Gaithersburg, MD 20878-1614.

The 2003 subscription rate for members of the American College of Dentists is $30 included in the annual membership dues. The 2003 subscription rate for nonmembers in the U.S., Canada and Mexico is $40. All other countries are $60. Foreign optional air mail service is an additional $10.
Single copy orders: $10.

All claims for undelivered/not received issues must be made within 90 (ninety) days. If claim is made after this time period, it will not be honored.

For bibliographic references, the *Journal* is abbreviated J Am Col Dent and should be followed by the year, volume, number, and page. The reference for this issue is J Am Coll Dent 2003; 70(2):1-36.

Publication Member of the American Association of Dental Editors

Mission

THE *JOURNAL OF THE AMERICAN COLLEGE OF DENTISTS* shall identify and place before the Fellows, the profession, and other parties of interest those issues that affect dentistry and oral health. All readers should be challenged by the *Journal* to remain informed, inquire actively, and participate in the formulation of public policy and personal leadership to advance the purposes and objectives of the College. The *Journal* is not a political vehicle and does not intentionally promote specific views at the expense of others. The views and opinions expressed herein do not necessarily represent those of the American College of Dentists or its Fellows.

Objectives of the American College of Dentists

THE AMERICAN COLLEGE OF DENTISTS, in order to promote the highest ideals, develop good human relations and understanding, and extend the benefits of good oral health to all, declares and adopts the following principles and objectives as ways and means for the attainment of these goals.

A. To promote within the dental profession the highest ethical standards, stimulate interprofessional relationships, urge upon the professional person recognition of his/her responsibility to participate in the affairs of society as a citizen of the community;

B. To take an active role in the support of dental education and research;

C. To encourage qualified persons to enter the profession of dentistry;

D. To encourage graduate education and improve continuing educational efforts by dentists and auxiliaries;

E. To encourage the free exchange of ideas and experiences in the interest of the patient;

F. To foster the extension and improvements of measures for the prevention and control of oral disorders; and

G. To confer Fellowship in the College on individuals in recognition of meritorious achievement and their potential for contributions in dental science, art, education, literature, human relations, and other areas that contribute to human welfare, and to give encouragement to them to further the objectives of the College.

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839J Quince Orchard Boulevard,
Gaithersburg, MD 20878-1614

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FROM THE EDITOR

Logic and Teleologic

The student sits across from the professor and explains that he should have another point on the final because he is only one point shy of an A and he needs an A to get into a specialty program. Years later he overtreats patients in order to promote his reputation as a leading practitioners and purchases dental products that claim to be fast and easy to use. Another student asks that his grade be adjusted because he found a reference in his class notes that supported an answer marked as wrong. In practice, this dentist bases most treatment decisions on diagnostic findings and selects products because their performance in practice match the research evidence supporting their claimed effectiveness.

The point of comparing these two dentists is not to suggest that one is a better practitioner. (The second may be a poor diagnostician.) It is to show that there are two basic ways to give reasons: a logical way and a teleological way. The second dentist bases his actions on what he believes to be true. He is logical. The first dentist reasons from what he wants the outcome to be. That is teleological reasoning. These are the two primary ways of justifying our actions.

Logic pushes us to action. It enjoys great respectability, especially among the "learned professions" because it permits rational people to share a common perspective in "looking at the facts as given." It is the basis of science. It is the way we demonstrate that we are reasonable. Although most professional practice is based on habit, we expect experts to be able to recite a logical chain from action to justification in commonly accepted facts.

Although most professional practice is based on habit, we expect experts to be able to recite a logical chain from action to justification in commonly accepted facts.

Teleologic pulls us to action. It is the purpose that animates us. Dentists perform conservative restorations to protect tooth structure, conduct oral screenings to detect cancer, and participate in organized dentistry to strengthen the profession. A teleological reason prompts action toward a desired future state. It is who we want to become.

Although it is a recognized character flaw to be illogical, bad teleology can be equally damaging. I will demonstrate some of the traps we are susceptible to when we try to finish a clause that begins "because..."

Faulty logic is common. "Individuals who are deficient in vitamin C suffer certain illnesses, therefore vitamin C prevents those illnesses." "A reduction of thirty seconds in setting time is desirable, so two minutes of reduction would be better still." "Research failed to find a significant difference between two products, therefore they are interchangeable." "People with a defective chromosome X always have X syndrome, and since my sister has the syndrome she must also have the defective chromosome." "The high correlation between falls among the elderly and broken legs or hips shows that the elderly are likely to break their limbs when they fall." None

A teleological reason prompts action toward a desired future state. It is who we want to become.

of these conclusions is logical. Scientists sometimes cringe when they see what use has been made of their research. A common logical fallacy is to selectively apply a "correct" conclusion out of context, or selectively emphasize or ignore some of the facts.

Teleology has been recommended since biblical times. In the Sermon on the Mount, Christians are urged to "be perfect." This has been misinterpreted to mean, "don't make any mistakes." Besides being inconsistent with the rest of the New Testament, "error-free" is not a possible translation of the Greek τελειος -- telos. The admonition is to become the person you were intended to be.

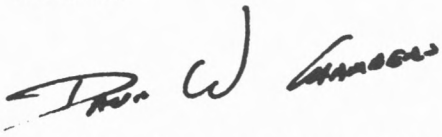
Although teleological reasoning is useful, there are three common mistakes associated with basing our actions on what we intend the future to be. The first error is to do what we feel like doing and to confuse that with what we should do. Every dentist has personal ambitions and goals in practice, but these must conform in a general way with the professional concept of a dentist. There is a rich variety in how the profession may be practiced, but it does not include putting one's interest before those of the patient; experimenting with faster, cheaper ways of doing things for profit; or doing large cases just to show how talented one is. The telos of dentistry is grounded in the expectations of professional colleagues and society as a whole. Making choices about procedures, materials, or practice patterns based on wanting to become an outstanding dentist is appropriate, professional, and admirable—as long as your colleagues would readily recognize that that is what you are doing.

But there is always one person whose teleology should be ruthlessly scrutinized by us. Ourselves! It is a hard enough job to be honest with ourselves, but well worth the effort.

Another error that must be guarded against is substituting acceptable reasons—logical or teleological—for the real reasons when those are suspicious. That is called rationalization. Telling a mother that her daughter needs to be referred to a specialist because of the complexity of the case (when you really don't want to manage a difficult patient) is using a logical explanation, regardless of its being sound, to support an unannounced teleological goal. "Shading the truth" when presenting alternative treatment options to a patient to maximize income is rationalization. We need to consider why continuing education providers advocate mandatory CE, why licensure jurisdictions claim to be protecting the public with one-shot tests of recent graduates, and why barriers exist to licensure portability.

The third danger is confusing our teleology with that of others. The student who says he needs an A to get into graduate school is probably telling the truth. But he is trying to make his problem the instructor's. Why do airlines and insurance carriers say, "federal law requires...," and people burst in with "I have an important announcement?"

Logic is attractive because we can argue with others when we find we don't agree. It is expected in a rational society. It is probably not a good idea, on the other hand, to challenge others' motives, their teleological reasoning. But there is always one person whose teleology should be ruthlessly scrutinized by us. Ourselves! It is a hard enough job to be honest with ourselves, but well worth the effort.



David W. Chambers, EdM, MBA, PhD, FACD
Editor

The Air Force Dental Service—Cross Into the Blue

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James Fancher, DDS
Thaddeus M. Chamberlain, DDS

Abstract

The Air Force Dental Service was founded shortly after World War II in order to provide oral health care to active duty, retired, and active reserve Air Force personnel, their families while overseas, and designated others. Grouped with medical facilities and organized by functional commands, the Air Force Dental Service enjoys a strong reputation in special operations, including education, forensics, expeditionary services (including combat and humanitarian efforts), the Dental Investigation Service, and the Air Force Inspection Agency.

The mission of the United States Air Force (USAF) Dental Service is to provide comprehensive dental care to eligible beneficiary populations, provide force health protection and preventive services to the active component, and provide direct expeditionary support to deployed forces worldwide. Air Force dentists serve in a variety of locations around the country and abroad, including forward-deployed sites and humanitarian missions. Opportunities range from large group practices at major medical centers offering a full complement of specialists, to smaller group practice settings where officers can deliver a broad range of comprehensive dental care.

Prior to 1947 and the establishment of the Air Force, dental support was provided to Army air crews by Army dental officers. Due to the unique considerations for the dental care of aviators, a separate dental department was created to support the special needs of the Army Air Corps in 1942. Two years following the creation of the United States Air Force in 1947, the Air Force Dental Service was formally established as a division of the Air Force Medical Service on July 1, 1949, with Brigadier General George R. Kennebeck as the first chief of the division and the title Assistant for Dental Services. The title was later changed to Assistant Surgeon General for Dental Services in 1960, and remains so today.

Organization

The Air Force Dental Service is organized as a service within the Air Force Medical Service (AFMS). The Assistant Surgeon General for Dental Services is the chief advisor to the Air Force Surgeon General on all dental matters. Dental service resources are part of the overall AFMS general budget and manpower allocations. There are currently approximately 1,100 officers and 2,200 enlisted and civilian members in the Air Force Dental Service in 85 dental treatment facilities worldwide, providing dental care for a beneficiary population of just under 400,000 active duty military members worldwide, and 90,000 family members overseas. The Active Duty Air Force also enjoys a close partnership with the Reserve Component, whose dental activities are managed by the Mobilization Assistant (MA) to the Air Force Assistant Surgeon General for Dental Services, usually serving in the grade of brigadier general. Reserve dental personnel have been an essential part of the Air Force mission, in war and in peace, since its inception.

The various treatment facilities and departments with the dental service are aligned under Air Force Major Commands (MAJCOMs): Air Education and Training Command, Air Combat Command, Air Mobility Command, Air Force Materiel Command, Air Force Special Operations Command, Air Force Space Command, United States Air Forces Europe, or Pacific Air Forces Command. Medical and dental facilities are located at various bases within a specific command, both within the United States' borders and overseas. Dental fa-

Dr. Murray (pictured left) is Assistant Surgeon General for Dental Services, Dr. Hancock is Director of Dental Services, Dr. Fancher is Graduate Dental and Continuing Education Consultant, and Dr. Chamberlain is Chief, of Dental Education, all with the U.S. Air Force Dental Service. Direct correspondence to Dr. Hancock at allan.hancock@pentagon.af.mil

cility managers or commanders report directly to their medical facility commanders, who in turn report directly to their Air Force line installation commanders. Consequently, the reporting chain of authority within the dental service goes from the individual facility level progressively to the Chief of Staff of the Air Force. The office of the Surgeon General and the Assistant Surgeon General for Dental Services therefore serve in an advisory capacity and provide resources to individual facilities but do not have direct command authority over them. The Air Force Academy and the medical facility at Headquarters Air Force in Washington, DC, have their own reporting chains, but are structured similarly to MAJCOMs. As a result of this organizational structure, there are a variety of command opportunities in the Air Force Medical Service for dental officers, including command at the squadron (usually a distinct organizational unit, such as a dental clinic) and group (medical facility) level, as well as the opportunity to serve on major command medical staffs and at the Headquarters Air Force level in the Surgeon General's office. Joint staff (serving on a staff with other military services) billets are also available for selected dental officers. The opportunity to command is considered a special privilege within the Air Force, and was once reserved exclusively for line (combat and operational) officers.

The Air Force features premier, world class training programs in all dental specialties, including orthodontics, endodontics, oral and maxillofacial surgery, periodontics, prosthodontics, pediatric dentistry, forensic dentistry, and comprehensive general dentistry, with subspecialty training in many disciplines.

Operations

Functionally, most Air Force dental facilities are group practices, varying from as few as two dental officers to fifty and up, with a variety of missions and specialty support. Air Force enlisted members support the officer corps in providing direct chairside care, radiographic and hygiene support, and laboratory services, as well as most of the administrative support. Most Air Force dental facilities are collocated with an Air Force medical facility, frequently within the facility. Medical facilities (generally designated as "groups") may also vary in size from small outpatient clinics to large medical centers, providing a complete range of medical services. Eligible beneficiaries for dental care in Air Force facilities by law include all active duty Department of Defense members, retired military members, family members overseas and within the continental US in specific cases, active reserve component members, and designees selected by the Secretary of Defense.

Dental officer and enlisted assignments are managed by senior leadership within the dental service at all levels, and more specifically by the office of the Director of Personnel at Randolph Air Force Base (AFB) in San Antonio, Texas. An Air Force career may involve several moves throughout the continental U.S. and overseas, and is one of the exciting parts of a military lifestyle. Individual assignments may span a year or less, or several years, depending on personal circumstances and the needs of the Air Force. Generally a single "tour" is from two to four years, with considerable variation. Almost every state in the continental U.S., and every continent on the globe, has Air Force members assigned,

Functionally, most Air Force dental facilities are group practices, varying from as few as two dental officers to fifty and up, with a variety of missions and specialty support.

who consequently require dental support, either arranged for or provided directly.

Individual facility "missions" (how they support the Air Force) may depend on their particular MAJCOM mission: Air Education and Training Command (AETC), for example, is responsible for all Air Force training programs, from teaching pilots to fly to teaching dental laboratory technicians how to make partial dentures. Consequently, all graduate dental education programs are located within this command. The Air Force Special Operations Command (AFSOC) mission, on the other hand, is to provide a rapid-response combat force. Dentists assigned to AFSOC may therefore be involved in directly supporting forward-deployed troops and have the critical responsibility to ensure that these forces are in good dental health at all times in order to be mobilized instantly. In addition to individual treatment facilities providing direct patient care, there are a number of functions within the dental service that provide unique capabilities—these include graduate dental education, forensic dentistry services, expeditionary dentistry, the Dental Investigation Service, and the Air Force Inspection Agency.

Graduate Dental Education. Graduate dental education is the responsibility of the Air Education and Training Command. The majority of gradu-

ate dental programs in the Air Force are conducted at large medical centers, such as those at Keesler AFB, Mississippi, Travis AFB, California, or the premier teaching facility (the Air Force "dental school"), Wilford Hall Medical Center at Lackland AFB in San Antonio, Texas. The Air Force features premier, world-class training programs in all dental specialties, including orthodontics, endodontics, oral and maxillofacial surgery, periodontics, prosthodontics, pediatric dentistry, forensic dentistry, and comprehensive general dentistry, with subspecialty training in many disciplines. We also offer a one-year Advanced Education in General Dentistry (AEGD-1) program for new dental officers, with a year of intensive clinical training in all major disciplines immediately after entry into the Air Force. In addition, there are opportunities in dental research; population health; a complete array of academic, administrative, and clinical fellowships; and the chance to follow an academic career track if desired.

The goal of the education programs of the USAF Dental Corps is to ensure that our patients receive the highest quality care possible from the best trained dentists who are required to support our many readiness and operational missions. Our life-long learning concept is aimed at meeting the training needs of our officers throughout their careers. The first training opportunities lay the career groundwork for recently graduated dentists by offering residencies in Advanced Education for General Dentistry and General Practice Residency. This provides recent graduates with a closely supported year of training in general and specialty practice that moves each dentist from dental school to the exciting world of the Air Force dental officer. A limited number of positions is also available for more senior clinicians who seek similar additional training.

Specialists are trained in all nine specialties recognized by the American Dental Association, plus general dentistry and fellowships in dental materials, maxillofacial prosthodontics, pain management, and air staff administration. Successful applicants are very competitive with civilian training. We average seventy residents in long-term training each year, plus an additional seventy in the initial one-year programs. All programs meet full accreditation standards, and many are world-renowned for research and resident accomplishments and staff excellence. This past year we have earned top awards in resident research competition in periodontics, endodontics, and prosthodontics.

Continuing education is available through local clinic sources as well as temporary duty assignments for training. Our clinically based courses offer true hands-on experiences, performing simple and complex dentistry in real practice settings. Comparable courses are generally not available in civilian education at any price. At one location alone (Wilford Hall), we provided nearly 22,000 hours of dental officer continuing education last year. Professional military education is also strongly encouraged in order to keep our officers fully embedded with our military culture and heritage.

The Dover facility participated in the identification of military members from the USS Cole, the 9/11 attack on the Pentagon, and both the space shuttles Challenger and Columbia disasters.

Forensic Dentistry. The Armed Forces Institute of Pathology (AFIP), a tri-service agency in the Department of Defense located in Washington, DC, administers and deploys personnel for operations at the Air Force Port Mortuary at Dover AFB, Delaware, when incoming deceased military members require forensic identification. Officers and enlisted personnel with a background in forensic dentistry, or even a keen interest in dental forensic science regardless of specialty, may serve in the Port Mortuary to participate in the dental identification of casualties brought to Dover. Since the mid-1970s, all deceased military members requiring identification have been received at this facility, which has a comprehensive set of diagnostic tools and specialists on call, from fingerprint analysts to DNA experts, in addition to state-of-the-art dental identification services. The Dover facility participated in the identification of military members from the USS Cole, the 9/11 attack on the Pentagon, and both the space shuttles Challenger and Columbia disasters. Positive identification through dental means plays a significant role in comforting surviving family members, resolving insurance issues, and solving legal disputes when an active duty member death occurs.

Expeditionary Dentistry. Expeditionary dentistry was once more appropriately termed "combat dentistry," but today Air Force dental officers and technicians are involved in much more than forward-deployed support of combat troops, although that is a significant mission of Air Force dentistry. Recent Air Force missions in Operation Enduring Freedom and Operation Noble Eagle post-9/11, and Operation Iraqi Freedom have all included dental personnel. But dental personnel have been deployed in every major conflict in which the United States has been involved, and have served with honor and distinction forward on the battlefield and in the rear echelons in a support role. Frequently Air Force dentists also serve a medical support function, depending on their training and experience, from starting IVs to supporting anesthesiology services. Air Force dentists and dental staff have been involved in many major humanitarian disaster relief operations as well, and have deployed globally in support of these. Air Force dentists have served in humanitarian relief missions more recently in Kosovo, Bosnia, East Timor, and Haiti. Special dental field units, developed with the assistance of the U.S. Army Dental Research Detachment,

have proven as essential in disaster relief as they have proven on the battlefield. Earthquakes, floods, and other natural disasters are all scenarios in which Air Force dentists have provided support to civil authorities, and will continue to do so, as well as in the new role of supporting Homeland Defense missions.

The Dental Investigation Service. The Dental Investigation Service was established on 1 October, 1976. Their primary function is to investigate and evaluate materials and equipment for use in Air Force dental facilities and to provide reports to the field describing their findings. It has become the premier organization in the world for this purpose, and the information they produce is available to all dental professionals, whether within or outside the Department of Defense. (They can be found on the web at www.brooks.af.mil/dis.) Initial research in development of the high-speed dental handpiece was the work of this organization. They work closely and are collocated with their Army and Navy counterparts, and are currently located at Great Lakes Naval Air Station north of Chicago.

The Air Force Inspection Agency. The Air Force Inspection Agency (AFIA), located at Kirtland AFB, New Mexico, is responsible for internal investigatory oversight and evaluation of all Air Force operations, including medical operations. They are the independent eyes and ears of the commander and senior leadership to answer the question "How are we doing?" Dental personnel work in close coordination with, and frequently beside, surveyors from the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) in evaluating the performance and compliance of all aspects of Air Force healthcare operations, traveling to medical facilities for on-site surveys. All Air Force medical facilities are accredited by the JCAHO.

Current Challenges

Current challenges in dentistry are not unique to the Air Force. A changing population demographic and education dynamic have highlighted healthcare concerns across the nation, including trends in dentistry, too few providers, rising costs, and reduced access. The Air Force faces challenges related to national trends -- average dental school debt exceeded $100,000 just within the last few years; sharply falling numbers of dental school graduates; and keen competition from the private sector. The Air Force currently offers from two- to four-year, fully funded scholarships as part of the Health Professions Scholarship Program (HPSP), paying tuition, fees, and a stipend to students selected for participation. The Air Force was also able to initiate, for the first time in 2002, a program to repay school loans for Air Force dentists currently serving on active duty. A hygiene training program was started in 2003 for selected Air Force enlisted dental technicians, where active duty Air Force enlisted members are sent —tuition paid—to civilian hygiene programs. In the recruiting arena, an accession bonus of up to $30,000 is paid to qualified dentists wishing to join the Air Force. In all, the Air Force has implemented a multi-pronged approach to attract and retain the finest graduates of our civilian dental institutions, with a combination of competitive benefits, world-class professional educational opportunities, and the chance to belong to a premier organization trained and exclusively committed to the defense of the nation.

Summary

The Air Force Dental Service offers a full range of career possibilities and challenges, in addition to the satisfaction of public service in the military. It carries a proud tradition of service to country, of commitment to excellence in the delivery of health care, and of pushing the far boundaries in the quest for knowledge in dental research and teaching. Opportunities in training, academics, command, or expeditionary dentistry are all part of the Air Force practice of dentistry. The Air Force Core Values of "Integrity first, service before self, and excellence in all we do" truly apply to the Air Force Dental Service.

Providing Care for America's Army

Joseph G. Webb, DMD, MS
Ann Sue von Gonten, DDS, MHA
W. John Luciano, DMD, MHA

Abstract
The Army Dental Corps' three-part mission is to maintain soldiers fit for combat, promote health, and ensure the Dental Corps ability deploy and deliver in the field. Consistent with this mission, the corps is developing innovative dental delivery systems and promoting tobacco cessation, sealants, mouth guard use, cancer detection, and identification of child, elder, and other abuse. The corps' training programs include options and benefits at the dental student, postdoctoral residency, and specialty levels. Recent technology innovations include light-weight field equipment, an integrated computer database to manage treatment, rapid ordering and delivery of supplies, and distance education.

The national tragedy that occurred on 9/11 and the resulting global war on terrorism have emphasized yet again the important role dentistry plays in national defense. The Army Dental Corps responded to the missions of homeland defense, operations in Afghanistan, and the war against Iraq while ensuring delivery of the peacetime dental benefit. Over one hundred seventy Army dental clinics exist worldwide to support the needs of the national defense mission.

The Dental Corps --whose mission is ensuring soldiers are dentally fit for combat, promoting health, and providing a force capable of delivering dental care in the field–faces new challenges and opportunities in the War Against Terrorism. In addition to providing care for active duty soldiers, the system faces the challenge of preparing soldiers in the Reserve and National Guard for numerous worldwide deployments. Colonel Robert Leeds, Commander of the Army Dental Command (DENCOM), states, "The Army recently mobilized over 150,000 National Guard and Army Reserve soldiers. They are evaluated by dental officers as part of the mobilization process to ensure that they are dentally fit for deployment." The need for dental care is great. "Based on past mobilizations, approximately one-third of these soldiers require immediate dental treatment," stated Colonel Leeds.

The Army Dental Corps Mission: Ensuring soldiers are dentally fit for combat, promoting health, and providing a force capable of delivering dental care in the field.

The Army Dental Mission

Major General Joseph G. Webb, chief, U.S. Army Dental Corps, states "One of the founding tenets of the Dental Corps is the recognition that dentistry is a separate health care product line. Although we are a unique health care delivery system, we are also part of the Army Medical Department team, working together to conserve the fighting strength and enhance the readiness of soldiers. Dental readiness continues to be at the forefront, both in the active and reserve components. There are several initiatives under way that are designed to enhance dental readiness for all soldiers."

Two strategic initiatives, the use of expanded functions dental assistants (EFDA) and dental care optimization (DCO), enable the Dental Corps to ensure maximum effective use of re-

Major General Webb (pictured) currently serves as Corps Chief, U.S. Army Dental Corps. Dr. von Gonten is Chief of Graduate Dental Education and Dr. Luciano is a staff officer for the dental command. Address inquiries to annvongonten@cen.amedd.army.mil

sources. According to the American Dental Association, an increasing number of Americans have access to needed treatment (American Dental Association, 2002). The U.S. Department of Labor's Bureau of Labor Statistics (http://www.bls.gov/oco/ocos072.htm) predicts the demand for dental services will grow significantly through 2010. There will be the "need to replace the large number of dentists projected to retire." Both EFDA and DCO initiatives are designed to enhance the clinical efficiency and effectiveness of the Army's dental workforce.

To enhance productivity, the Army Dental Corps partnered with the Indian Health Service to train EFDAs. The EFDAs are capable of placing restorations and performing other reversible procedures. According to Colonel John Luciano, from the Army Dental Command, "The EFDA program acts as a 'dental force multiplier' by allowing delegation of appropriate dental procedures to highly qualified auxiliaries."

DCO re-engineered the traditional "one chair, one doctor, one hour" approach to a more effective means of delivering health care to the world's single largest dental population. The DCO model empanels service members and assigns a specific primary care team responsibility for managing all the dental needs of the patient panel, including specialty referrals. Appointments are customized to patient needs. Practice management software is exploited to facilitate scheduling and record keeping. A heightened emphasis is placed on health promotion. A "practice manager" directs activity throughout the entire clinic. The result is a series of healthcare and management outcomes supporting the mission and vision of the Army Dental Care System (ADCS).

The ADCS remains strongly proactive in integrating disease prevention and health promotion into care delivery. In 1998, the ADCS created a health promotion program, "Put More 'Bite' Into Health Promotion." According to Major Jeffrey Chaffin, DENCOM Public Health Dental Officer, "The program encourages dentists to focus on the entire well being of the individual." The foundation of the four, patient-oriented approaches to health promotion includes tobacco interdiction and cessation counseling; sealants; mouth guards; and skin, lip, and oral cancer screening. The newest addition to the Health Promotion Program is the PANDA Program—Prevent Abuse and Neglect through Dental Awareness. DENCOM, in partnership with the Army Family Advocacy Program, is working to create an atmosphere of understanding that will result in the prevention of abuse and neglect through appropriate intervention for all suspected victims of family violence. The literature indicates that between 65% and 94% of physical injuries incurred from abuse occur on the head, neck, or face (daFonesca, Feigal, & ten Bensel, 1992; Ochs, Neuenschwander, & Dodson, 1996). Dental health care providers are in an excellent position to detect physical abuse.

Officers, young and old, participate in humanitarian assistance missions, often to countries facing significant health challenges. Colonel William Johnson, a former commander notes, "My career in the Army Dental Corps provided me the opportunity to travel extensively throughout Europe, Asia, and Africa. It allowed me to represent my profession and country in NATO where I met many wonderful and important people. It gave me the pleasure of leading humanitarian missions into Romania and Africa where I saw the gratitude from the thousands whose lives were spared or improved with simple medical care that Americans take for granted. I've tried to make my career exciting and, in the process, I've been rewarded with experiences that will bring me and my family satisfaction for a lifetime."

The Army Dental Officer

The profession of being an Army dentist is unique. Military dentists play an important dual role as both military officers and dentists. This dual role provides a career of combined opportunities simply not available in other sectors of society. Colonel Michael Cuenin, commander, Wuerzburg Dental Activity, stated "I am in the corps because I chose to join this dynamic group dental practice upon graduation from dental school. I did not plan a career in the Army, but over the years the opportunities that presented to my family and me led to our decision to continue to serve.

I saw the gratitude from the thousands whose lives were spared or improved with simple medical care that Americans take for granted.

Though fundamentally a clinician, my career as a combat service support officer in the Army Medical Department has allowed me to not only practice clinically, but also gain further postdoctoral education and credentials. I have enjoyed the opportunity to manage clinic resources as well as to teach and practice in the Army Dental Care system."

Another unique aspect of being an Army service member is the compensation package and career progression opportunities. All individuals, regardless of sex or ethnic group, are paid equally while on active duty and accrue the same retirement compensation benefits. All Army dentists, regardless of demographic affiliation, compete on an equal basis for academic, administrative, and command positions within the Army Dental Corps.

The costs of dental school today often burden students with enormous educational debt. Dental school debt averaged $80,000 and often exceeded $140,000 in 2000. The Dental Corps offers an excellent Health Professions Scholarship Program (HPSP) to qualified students. It pays all tuition, required fees, books, and also provides a monthly stipend of over $1100. The F.

Edward Herbert Armed Forces Health Professions Scholarship Program allows the U.S. Army to offer one-, two-, three, and four-year scholarships to selected students. In addition, the program enables students to be commissioned as officers in the United States Army Reserve and, while completing school, receive a stipend for ten and one-half months each year. For the remaining one and one-half months during active duty for training, students receive pay and allowances as a second lieutenant.

HPSP participants are eligible to apply during the senior year of dental school for the Army's Advanced Education in General Dentistry 1-Year program (AGD 1-Year). The Army Dental Corps selects at least forty senior dental students annually to train in this program. As a stepping stone to further specialized training or as a means of better preparing for general practice, the knowledge and experience gained in this residency are invaluable. Colonel Lee Covington, director of the Fort Benning AGD 1-Year program states, "The Dental Corp's Advanced Education in General Dentistry 1-Year program offers an excellent opportunity for new dentists to greatly increase their dental knowledge, confidence, and clinical skills in providing comprehensive dental care for their patients." Residents receive postgraduate level, one-on-one clinical training from board-certified specialists representing each dental specialty area. The goal of the program is to develop well-rounded clinicians who provide the full scope of dental care for patients with limited referrals to specialists. AGD 1-Year graduates routinely comment that they have learned more in this one year of training than in the previous four years of dental school combined."

In addition to the AGD 1-Year program, graduating dental students also have the opportunity to apply for a limited number of classical specialty training positions. In the past two years these training opportunities included comprehensive dentistry, endodontics, prosthodontics, pediatrics, orthodontics, and oral surgery.

Postgraduate dental education is highly valued in the Army Dental Corps as evidenced by training opportunities for officers in eight of the specialty areas recognized by the American Dental Association. Fellowships are also offered in orofacial pain, maxillofacial prosthetics, dental materials, cosmetic surgery, maxillofacial trauma, and head and neck oncology and reconstructive surgery. Recognizing that postgraduate dental education is one of the greatest recruitment and retention tools within the Army Dental Corps, dual training opportunities exist for officers with board certification and five years in their specialty.

The majority of specialists seek board certification. This credential qualifies individuals for academic appointments as directors, assistant directors, and mentors in graduate dental education programs. According to Colonel Ann Sue von Gonten, Chief of Graduate Dental Education, "One of the great advantages to teaching in the Dental Corps is that pay is commiserate with rank. For example, a board-certified dental officer with sixteen years of military service teaching in a residency program earns significantly more than a comparable, civilian dental school instructor. The salary, made up of a 'base' pay along with special pay and bonuses, greatly exceeds that achieved by most faculty in civilian postgraduate dental residency programs." She also adds, "Salaries never decrease. Each year the officers receives inflation adjusted cost of living allowance to their base pay. This is in addition to thirty days paid vacation." The value of the active duty compensation package is even more valuable for officers who retire. They accrue lifetime healthcare benefits and a life-long, inflation protected retirement plan.

Innovations in Oral Health Care Delivery

The U.S. Army Dental Research Detachment (USADRD) is instrumental in enhancing the delivery of dental care in the field by developing lightweight equipment for field deployment. While he served as chief of the Bioengineering Branch at the USADRD, Colonel Steve Eikenberg was instrumental in developing the Dental Field Treatment and Operating Systems (DEFTOS). DEFTOS is 50% smaller and lighter than the current air turbine systems and requires fewer than 700 watts (peak) to operate. The low energy requirements allow the DEFTOS to operate from the slave cable of a Humvee, a 24-volt battery system, or a 1-kilowatt generator. Weighing only 42 pounds and taking up only 3.5 cubic feet of space, DEFTOS is disassembled by the simple release of two suitcase-style latches. When DEFTOS is employed in conjunction with new radiographic techniques (digital radiography and self developing film) and the newly procured hand-held x-ray, which was originally developed by USADRD, the weight savings for the forward deployed dentist are significant. These developments will greatly enhance dental treatment capabilities, including humanitarian assistance missions. Other major projects at USADRD include development of a novel anti-plaque agent that could be included in field rations for soldiers and improvements in a ballistic face shield.

These technological innovations contribute to the Dental Corps' ability to support soldiers in the austere and hostile environments in which they often serve. Army dentists are serving in the field with our combat units in Afghanistan and Iraq. This is in addition to many other worldwide deployments that include peacekeeping operations in Kosovo, Bosnia, and the Sinai.

The Corporate Dental Application (CDA) serves as the Dental Command's backbone platform for the collection of administrative data, patient treatments, workload data, and dental readiness. CDA is essentially a data "warehouse" that is located on a central Dental Command server and is fed data by various regional dental servers. CDA acts as a decision support system across the entire system. CDA automation queries can translate collected data into relevant, useful information for system managers at all levels of the organization. The system

incorporates a patient scheduling component and is HIPAA compliant. In its fourth year of deployment, CDA is quickly approaching the intended goal of 100% accurate, real-time reporting of workload, readiness, and administrative data.

In addition to the CDA, the Army Dental Corps continues to incorporate new technologies to deliver cost-effective care. Examples include the use of digital imaging and video conferencing to better communicate and reduce travel costs. One of the most successful ventures is the innovative Prime Vendor Contract that is a Web-based ordering system for dental supplies. The contract provides for seventy-two-hour delivery of supplies to dental treatment facilities within the continental United States and a seven to ten-day delivery suspense to those facilities outside the continental United States.

Innovations in distance learning training for the workforce include a partnership with the American Dental Assistant Association. Continuing education is available for all ADCS assistants regardless of employment status. Training is provided at no cost to the participant and eligibility extends to all government and active duty military dental assistants.

Army dentistry continues to serve the country by building teams of highly trained professionals. The Army Dental Corps takes advantage of technological and management innovations to ensure that America's Army receives world-class dental care.

References

American Dental Association (2002). Future of dentistry—Executive summary. Chicago, IL: The Association.

Ochs, H. A., Neuenschwander, M. C., & Dodson, T. B. (1996). Are head, neck and facial injuries markers of domestic violence? *Journal of the American Dental Association, 127*, 757-761.

daFonesca, M. A., Feigal, R. J, & ten Bensel, R. W. (1992). Dental aspects of 1248 cases of child maltreatment on file at a major county hospital. *Pediatric Dentistry, 14* (3), 152-157.

Navy Dental Corps: Ninety Years...and Forward

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Abstract

The Navy Dental Corps is responsible for ensuring the readiness of America's sailors and marines and optimizing their oral health. This article traces the history from the 1912 Act of Congress authorizing thirty "assistant dental surgeons" as the first Navy Dental Corps through service around the world. Navy dentists have seen service in every war and action in the past ninety years, reaching a peak of seven thousand officers and eleven thousand technicians in World War II. The Navy Dental Corps has served in the Korean and Vietnam Wars, Beirut, Somalia, Haiti, 9/11, Desert Storm, Desert Shield, and Operation Iraqi Freedom.

The pilot salutes as another F/A-18, straining at its catapult, bolts forward, a thunderous roar echoing off the ship's island. Thrown off the bow of the USS Theodore Roosevelt (CVN 71-"TR"), the Hornet disappears momentarily from view, then powers toward the new morning sun just cresting over the glass-still horizon. A new day dawns at sea, where CDR Kenny (Dental Corps, USN) and several thousand other TR Sailors, are already well into their workday in a ship that never sleeps.

That same sunrise soon melts the early morning haze enveloping Camp Coyote, where marine sentries in fortified bunkers peer over desert sands. LT Adcook (Dental Corps, USNR) secures the flaps on the tent, checks his holster and gas mask, and heads for the hot breakfast chow line.

The morning light is also welcome for LT Avila (Dental Corps, USNR) and his "Can Do" Seabees of Naval Construction Battalion 133, as they continue to carve roads in desert sands and build camps—and a field dental clinic—where nothing existed before.

America's front line warriors begin another day at the tip of the spear and Navy dentistry is there. At sea and in vast desert wastelands, maintaining the readiness and health of each sailor and marine is critical. CDR Kenny, LT Adcook, LT Avila, and many Navy dental officers take this challenge seriously, as they eat, sleep, and go to war with our nation's combatants.

The United States of America has grown strong on the shoulders of young men and women in uniform and our armed forces empower this nation to determine its own destiny. The Navy Dental Corps, as part of the Navy Medical Department, is but one of many critical organizations that ensures the readiness of sailors and marines. Structured to provide optimum support and focused on mission, Navy dentistry is well positioned to respond to the challenges of the 21st century.

Our stated mission is clear and unequivocal: to ensure the dental readiness of our sailors and marines while optimizing their dental health. Our increasingly complex military now boasts the most highly educated and skilled force in this nation's history. A deployed military commander can ill afford to lose one

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sailor or marine to a dental problem, and ensuring our expeditionary forces deploy ready and healthy is a daunting task. We have been up to that challenge throughout our ninety-year history, with each era highlighted by exceptional performance and personal sacrifice. Over the last nine decades, we have matured to a world-class dental health care organization, setting a high standard for excellence in education, research, health promotion, and prevention.

Today, with superb support from Navy dental technicians, Medical Service Corps officers, "Navy civilians," and Red Cross volunteers, nearly thirteen hundred Navy dental officers continue the proud tradition of our corps, fully recognizing our history and building on the accomplishments of our predecessors. What a history it is!

The Formative Years

Navy dentistry's birthright is as old as the Navy itself, however, the dawn of our existence can only be traced back to 1873. Civilian dentists ashore, medical corps officers, and hospital corpsmen with little experience in dentistry were primary care givers for dental problems. Treatment provided was meager.

Though rejected year after year by Congress, the Bureau of Medicine and Surgery drafted a Navy Dental Bill to authorize the employment of civilian dentists at large Navy facilities in the United States and abroad. The text of this bill would appoint dental surgeons to military rank. Not until August 1912, during William Taft's presidency—a man with a passion for sweets—did Congress pass the bill and establish the Navy Dental Corps. Our legacy had begun.

Not until August 1912, during William Taft's presidency—a man with a passion for sweets—did Congress pass the bill and establish the Navy Dental Corps.

The Secretary of the Navy was authorized to appoint no more than thirty acting "assistant dental surgeons" as part of the Medical Department. In October 1912, Emory Bryant and William Cogan became the first two dental officers to enter active duty with the Navy. One year later, the Surgeon General reported that the Medical Department now had the ability to provide dental care that would allow the Navy to accept recruits who would otherwise be rejected for defective teeth.

When the U.S. entered World War I on 6 April 1917, thirty-five dental officers were on active duty; the number grew to five hundred by the war's end. Most were assigned to ships or overseas activities. Thirty dental officers served with the marines in France; two were awarded our nation's top honor. Lieutenant (junior grade) Alexander G. Lyle received the Medal of Honor while serving with the 5th Regiment, U.S. Marines. Lieutenant Weeden E. Osborne, the first Navy officer to meet death fighting overseas in the war, was awarded the Medal of Honor for heroism while serving with the 6th Regiment, U.S. Marines. The torpedo boat destroyer USS Osborne (DD-295) was commissioned in his honor in December 1919.

The value of uniformed dentists to the Navy was now universally recognized and a period of steady growth ensued. Early in 1923, two significant milestones occurred: the establishment of the U.S. Naval Dental School and the creation of a Dental Division in the Bureau of Medicine and Surgery. There were one hundred and fifty dental officers on duty at the time. During this era, Navy dentistry began focusing heavily on prevention of disease, unique at the time and a quality that distinguishes our corps today. Navy dentists demonstrated their skills throughout the 1920s and 1930s in Navy and Marine operations overseas in Haiti, Nicaragua, and China. By 1939, two hundred and fifty-five dental officers served at twenty-two major dental facilities ashore and afloat. When Japanese forces attacked Pearl Harbor on December 7, 1941, seven hundred and fifty-nine dental officers were on active duty at three hundred and forty-seven dental facilities. Two Dental Corps officers were killed in that bombing—LCDR Hugh R. Alexander, aboard USS Oklahoma (BB-37) and LCDR Thomas E. Crowley, aboard USS Arizona (BB-39). Less than a month later, the Surgeon General directed all dental officers become proficient in the treatment of casualties, to assist in sick bays and operating rooms, administer supportive therapy, and give anesthetics. Dental officers, assisted by dental technicians, per-

Over the last nine decades, we have matured to a world-class dental health care organization, setting a high standard for excellence in education, research, health promotion, and prevention. A deployed military commander can ill afford to lose one sailor or marine to a dental problem, and ensuring our expeditionary forces deploy ready and healthy is a daunting task.

formed such duties heroically and, for a few, at the cost of their lives.

As the United States ramped up for world war, the manpower requirement was staggering. There was little consideration for the dental status of recruits. Recognizing potential readiness problems, the Dental Corps initiated a massive rehabilitation program in May 1942 to prepare sailors and marines prior to transferring them overseas.

As the world fought, many dental officers were killed in action aboard warships and in major battles at Guadalcanal, Tarawa, Saipan, and Iwo Jima. For their heroic efforts, ninety-three received personal awards, to include the Silver Star, Legion of Merit, Navy and Marine Corps Medal, and the Bronze Star.

When the Pentagon was hit, Tri-service Branch Dental Clinic personnel were among the first responders to the carnage. Without regard for personal safety, five members ran into the burning building to save life and limb, while others began initial triage and treatment of the injured.

A Powerful Program

In 1942, a most significant milestone in Navy dentistry's history took place when the Naval Dental School was commissioned as part of the National Naval Medical Center, Bethesda, Maryland. Thus began a journey to excellence and today the Naval Dental School is home to one of the dentistry's premier postgraduate education programs. On December 18, 1942, President Roosevelt approved the rank of rear admiral for our first flag officer, Medal of Honor recipient, RADM Alexander G. Lyle.

At the war's end in 1945, 7,026 dental officers served on active duty and 1,545 dental facilities were in operation. Dental technicians numbered 11,339 and there were 1,200 "dental" WAVES. One of these, Dr. Sara G. Krout became LT Sara Krout, Dental Corps, USN Reserve, the first female dental officer in the armed forces.

Recognizing their leadership and management abilities, dental officers were eventually assigned command of their own facilities. On March 13, 1946, the first Navy dental clinic was commissioned under command of a dental officer at the Naval Shipyard, Brooklyn, New York. In 1948, dental technician training was formalized with the establishment of dental technician schools at the Naval Training Centers, Great Lakes, Illinois, and San Diego, California.

On June 27, 1950, President Truman ordered our armed forces into action in Korea. As the 1st Marine Division deployed, dental officers and technicians marched with marines onto the battlefield, providing dental and medical support forward. Korea marked the first time in history that enlisted men of the Navy wore dental rating badges into combat. One such sailor was DN Thomas A. Christianson, awarded the Navy Cross posthumously for his gallant efforts while serving with the 1st Amphibious Tractor Battalion. At the peak of the action, 1,900 dental officers and 4,700 technicians were on duty. Dental personnel served heroically: fifteen dental officers earned personal commendations, to include the Silver Star, Bronze Star, and Commendation Ribbon with Combat V.

Revolutionizing the field of dentistry worldwide, researchers at the Naval Dental School developed pioneer models of the dental air turbine hand piece and ultrasonic vibrating instruments. This was a tremendous leap forward for the dental profession and these prototypes are displayed today at the Smithsonian Institution.

By the beginning of the 1960s, dental officers operated from one hundred and sixty shore-based facilities and aboard one hundred and fifty-six ships. To support Marine Corps operations, Navy dentistry developed innovative ways to take its skills to the field. Achievements by Navy dental research and development personnel soon led to the deployment of nine mobile dental units on trailers, each with more powerful rotary instruments, a field x-ray unit, and a film processor. These field dental capabilities proved their worth when 3rd Dental Company deployed with marines to Vietnam in June 1965. Many more dental teams would follow. Between 1965 and 1973, dental personnel from the 1st, 3rd, and 11th Dental Companies, along with detachments of the 15th, deployed to Vietnam in support of marine ground and air combat units. In addition to caring for marines, dental personnel participated in many civic action programs, rendering humanitarian aid to Vietnamese civilians. They also trained Vietnamese dentists in basic and advanced dental procedures as part of the "Vietnamization" program. At the peak of the Vietnam War, there were four hundred twenty dental officers and seven hundred ninety dental technicians—approximately one-fifth of the Dental Corps—attached with marine units.

Modern Operations

In 1975, the nuclear powered aircraft carrier, USS Nimitz (CVN-68) was commissioned with the most modern and capable dental facility afloat, supporting seven dental operating rooms, a prosthetic laboratory, central sterilization room, x-ray suite, and preventive dentistry room. When a Navy jet crashed on Nimitz's flight deck on 26 May 1981, killing fourteen and injuring forty-eight, dental personnel played a critical role in the mass casualty response.

The tragic bombing in 1983 of the marine barracks of Battalion Landing

Team 1/8, 24th Marine Amphibious Unit, in Beirut left two hundred and forty-one American servicemen dead. The only on-scene Navy physician was killed, along with eighteen hospital corpsmen. Two dental officers assigned to the 24th Marine Amphibious Unit coordinated emergency trauma care with fifteen hospital corpsmen, treating sixty-five casualties in the first two hours following the explosion. Both were later awarded Bronze Stars for their leadership and emergency medical services. Additional dental personnel aboard USS Iwo Jima (LPH-2) joined medical teams ashore to provide care and support for survivors.

In July 1984, the Navy began conversion of two supertankers to hospital ships. USNS Mercy (T-AH 19) and USNS Comfort (T-AH 20) were placed in service in December 1986 and August 1987, respectively. In addition to one thousand beds and twelve operating rooms, each ship supports comprehensive dental services in two operating rooms, four dental treatment rooms, and a dental laboratory. In the mid-1980s, when the Battleships Iowa (BB-61), New Jersey (BB-62), Missouri (BB-63), and Wisconsin (BB-64) were recommissioned, dental spaces were upgraded to provide quality dental support under way.

In March 1986, the Naval Postgraduate Dental School moved into its new spaces in Building 1 on the National Naval Medical Center campus in Bethesda, Maryland. What began as the Dental Department of the Naval Medical School in 1923 has evolved into a state of the art, fully accredited, postgraduate dental school recognized as one of the best in the world. The Navy Dental Corps has been a leader in all phases of dental postgraduate education, including residency training, correspondence courses, and CE courses. Many dental officers trained at the school have gone on to become leaders in education in dental schools across the nation.

With the Iraqi invasion of Kuwait in August 1990 and the commitment of U.S. forces to the region, detachments of the 1st, 2nd, and 3rd Dental Battalions deployed in support of the 1st and 2nd Marine Divisions. Dental Battalion personnel ultimately established twenty-one dental clinics in three countries, in such places as the marine airfield at Sheik Iza, Bahrain, the Port of Jubail in Saudi Arabia, and in the desert sands of northern Saudi Arabia and Kuwait. The hospital ships Comfort and Mercy brought their dental services to the war effort and active and reserve dental personnel were deployed with each of the three fleet hospitals in the theater. In all, more than ninety dental officers and three hundred dental technicians deployed in support of Desert Shield and Storm.

In 1992, civil unrest in Somalia erupted into all-out tribal war. Marines of the 1st Force Service Support Group arrived in Mogadishu and 1st Dental Battalion personnel provided dental care for marines in the country. Supporting the State Department's peacekeeping efforts, they also provided humanitarian dental care to Somali citizens.

In June 1998, the Dental Corps answered the call in Port-au Prince, Haiti. CDR Steve Clarke, a dental officer, commanded a medical task force composed of sixty-five medical and dental personnel from the Navy, Marine Corps, and Army. Over the next six months the task force provided advanced health services to assigned U.S. Support Group and United Nations personnel, while conducting regular humanitarian assistance missions throughout the country.

The attacks of 9/11 changed life in America. When the Pentagon was hit, Tri-service Branch Dental Clinic personnel were among the first responders to the carnage. Without regard for personal safety, five members ran into the burning building to save life and limb, while others began initial triage and treatment of the injured.

USS Teddy Roosevelt's six dental treatment rooms shudder imperceptibly as the returning Hornet hits the deck above, catching the third trap line. For the hundredth time, CDR Kenny walks through her assigned battle station and reviews her role in TR's mass casualty plan. LT Adcook wipes the sweat from his brow and stretches; he and other dental and medical personnel celebrate the filling of the one-thousandth sandbag, as they fortify their clinic and berthing tents. LT Avila is polishing the new composite he has just placed on tooth #8 for a young Seabee, when the battalion medical officer raises the clinic tent flap and advises they'll be breaking camp and moving forward, yet again.

Today, the Navy Dental Corps continues its mission—at home and abroad, aboard sixty ships at sea, and with marines in Operation Iraqi Freedom. We are well integrated with medical personnel in casualty care arenas and actively defining our role for the latest front, Homeland Defense. Our participation in humanitarian assistance and disaster relief missions contribute to our nation's efforts in peace keeping and nation building in third world countries.

Proud in uniform, outstanding in performance, and dedicated to provide the best for our sailors and marines, the Navy Dental Corps completes another successful chapter in its ninety-year history...and steams into the next.

Promoting the Public's Oral Health: The Department of Health and Human Services, U.S. Public Health Service, and the U.S. Public Health Service Commissioned Corps

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Abstract

The story of the Department of Health and Human Services (DHHS), its United States Public Health Service (US PHS), and the US PHS Commissioned Corps is comprised of people and programs aimed at protecting and promoting the nation's health, including oral health. The federal precursors of these organizations focused on clinical services for federal beneficiaries, and with time grew to include federal support for community and state programs for underserved and institutionalized populations; biomedical and behavioral research conduct; drug, device, and food regulatory activities; and, most recently, an enhanced response to biodefense and emergency readiness, among other activities. An essential component of the workforce addressing these activities is the US PHS Commissioned Corps, directed by the Surgeon General of the US PHS. This corps is a mobile, uniformed health service assigned to programs throughout the DHHS, as well as to other departments and agencies as needed. Dentistry has been a critical part of these programs and of the corps since their inception.

Protecting and promoting the public's health requires the well-timed choreographed efforts of a multidisciplinary workforce armed with diverse programs and funding mechanisms. These people and programs service the nation's poor, institutionalized, and medically compromised individuals; wage war on disease and disability; search for new knowledge to promote health and prevent disease; watch over the public's safety by regulating drugs, devices, and foods; and respond to national emergencies, due to natural or other causes. Such are the programs and people of the Department of Health and Human Services (DHHS). The work is carried out at federal, state, and local institutions; professional and voluntary agencies; academic health centers; as well as internationally, through the provision of direct services, technical assistance, dissemination of information, and by partial or full funding of programs, grants, and contracts.

The DHHS houses the United States Public Health Service (US PHS), which includes a range of agencies designed to address different aspects of the nation's health. It also houses the US PHS Commissioned Corps, a mobile, uniformed health service of approximately 6,000 health professionals under the command of the surgeon general of the US PHS. The surgeon general deploys officers with specified expertise to address

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chronic and acute national needs as warranted. The events of 9/11/01 and anthrax are recent examples of the corps' emergency preparedness capacity and roles, mobalized when the President declares a major emergency. Dental officers were deployed to provide forensic services, triage, primary care, and epidemiologic investigations and to manage risk communication with the public and with health professionals.

Additional populations were added in the 1920s and 1930s, such as immigrants treated at the Ellis Island Marine Hospital, U.S. Coast Guard cutters and bases, prisoners in federal penal and correctional institutions, and American Indians and Alaska Natives.

Just imagine specific populations as the patient, the myriad of programs as patient's treatment, and the health statistics as measures of function. The workforce conducting the diagnosis and treatment planning involves health care professionals, researchers, educators, regulators, lawyers, administrators, and many more. This workforce includes civil servants and contract employees in addition to officers in the US PHS Commissioned Corps. This paper will provide a brief overview of the history of the US PHS, the public health functions addressed by the current programs of DHHS, and a summary of the US PHS Commissioned Corps in order to place dentistry and oral health in this part of the federal services into context.

Origins

The history of the US PHS is important to understanding the current structure of DHHS and the operation of the US PHS Commissioned Corps. Dentistry and oral health programs have been an integral part of the US PHS's history, one that is dynamically intertwined with America's political, social, and public health history (Harris, 1989; Mullan, 1989; U.S. Public Health Service, 1994). The origins of the US PHS began with the "the temporary relief and maintenance of sick or disabled seamen" in the late 1790s (Mullan, 1989). In 1798 Congress created the Marine Hospital Service under the Treasury Department's Revenue Marine Division which ultimately led to the US PHS and the U.S. Coast Guard. In 1889 President Cleveland signed an act to regulate appointments in the Marine Hospital Service, formally establishing the Commissioned Corps. Initially the corps included only medical officers and grew to include a multidisciplinary health professions workforce to accomplish the complex aspects of services delivery, research conduct, and education. In the early 1900s an Army and Navy organized corps of dentists, together with the Department of Interior's contractual arrangements with dentists to provide care on Indian reservations, comprised the federal provisions for dental health. In fact the Army Dental Corps was the training ground for the first generation of US PHS Dental Corps officers.

The 1900s saw the growth of federal beneficiaries for whom health care was to be provided by the US PHS. In 1919, veterans of World War I were added and their oral health care first came under the dental services of the US PHS in 1919 until the establishment of the Vet-

Table 1: Chronology of Public Health Service Leadership.

Chiefs of the Dental Section, Division of Marine Hospitals and Relief	
(Dental) Surgeon (Res) Clinton T. Messner	1923-1936
Dental Surgeon Charles W. Wekenman	1936-1938
Dental Surgeon Norman V. Hooper	1938-1941
Senior Dental Surgeon William T. Wright, Jr.	1941-1943
Chief Dental Officers, U. S. Public Health Service	
Assistant Surgeon General William T. Wright, Jr.	1943-1948
Assistant Surgeon General Bruce D. Forsyth	1948-1952
Assistant Surgeon General John W. Knutson	1952-1961
Assistant Surgeon General Ralph S. Lloyd	1962-1966
Dental Director Jack D. Robertson (Served as Acting Chief Dental Officer)	1967-1981
Assistant and Deputy Surgeon General John C. Greene	1973-1981
Assistant Surgeon General Robert E. Mecklenburg	1981-1987
Assistant Surgeon General Daniel F. Whiteside	1987-1991
Assistant Surgeon General Preston A. Littleton (Served as Deputy Chief Dental Officer)	
Assistant Surgeon General Robert J. Collins, Jr.	1991-1995
Assistant Surgeon General Stephen B. Corbin	1995-1997
Assistant Surgeon General William A. Maas	1997-2001
Assistant Surgeon General Dushanka V. Kleinman	2001-

erans' Bureau in 1922. Additional populations were added in the 1920s and 1930s, such as immigrants treated at the Ellis Island Marine Hospital, U.S. Coast Guard cutters and bases, prisoners in federal penal and correctional institutions, and American Indians and Alaska Natives. The care of federal prisoners began in 1930, when President Hoover signed a law creating the Federal Bureau of Prisons (BOP) within the Department of Justice. This law called for the development of an integrated correctional system and included provisions for the assignment of US PHS officers to supervise and provide medical, dental, psychiatric, and other services. In 1955, Congress established the Indian Health Service in the US PHS in order to have health care professionals, including dentists, oversee the programs. This resulted in the transfer of staff, hospitals, and school infirmaries from the Department of the Interior to the then Department of Health, Education and Welfare.

Training, research, and service programs also evolved. Postgraduate training programs were launched, with the first dental internship at the New Orleans Marine Hospital in 1927. Dental research opportunities in the PHS Hygienic Laboratory and in the field began with Frederick McKay's early study of enamel mottling in response to a request of a state health officer. In 1948 the National Institute of Dental Research was legislated as one of the first three institutes at the National Institutes of Health, strongly supported by the American Dental Association to establish a knowledge base for the profession and address the extensive oral diseases of the nation. Other targeted programs were developed during the mid-1900s. Selected examples of programs include grants-in-aid to states for maternal and child health services including oral health, grants to support dental health professions educa-

Table 2: Selected Department of Health and Human Services' Programs that Include Oral Health Programs or Activities

Agencies of the U.S. Public Health Service, DHHS

Agency for Healthcare and Research Quality—supports research designed to improve health outcomes and quality of care, including dental research. (www.ahrq.gov)

Agency for Toxic Substances and Disease Registry—works to prevent exposure and adverse human effects associated with exposure to hazardous substances. Dental officers are assigned to this agency. (www.atsdr.cdc.gov)

Centers for Disease Control and Prevention—promotes health and quality of life by preventing and controlling disease, injury and disability (www.cdc.gov). The National Center for Chronic Disease Prevention and Health Promotion houses the Division of Oral Health (www.cdc.gov/oralhealth/index.htm) and dental officers are also assigned to other programs in CDC.

Food and Drug Administration—assures safety and efficacy of medical devices, biologic products and drugs and the safety of foods (www.fda.gov). Dental officers contribute to the review and regulations of oral health products, devices, and therapeutics.

Health Resources and Services Administration—directs national health programs aimed at assuring equitable access to comprehensive, quality health care to all (www.hrsa.gov). Oral health programs are found in most of the agency's bureaus.

Indian Health Service—primary federal provider and advocate for the health of American Indians and Alaska Natives (www.ihs.gov). Dental services are an integral part of the health care programs.

National Institutes of Health—supports biomedical and behavioral research and research training (www.nih.gov). The National Institute of Dental and Craniofacial Research is one of the twenty-seven institutes and centers (www.nidcr.nih.gov).

Other Agencies of DHHS

Centers for Medicare and Medicaid Services—administers Medicare and Medicaid programs and the State Children's Health Insurance Program (SCHIP) (www.cms.hhs.gov). Dental services are included in the Medicaid and SCHIP programs.

Administration for Children and Families—houses the Head Start Bureau (www.acf.hhs.gov/programs/hsb). Oral health services have been an integral part of this program since its inception.

tion, funding and staff for the promotion of community water fluoridation and community-based programs, and the establishment of the National Health Service Corps that provided health professionals with scholarships in return for provision of services, including dental services, in shortage areas.

These initial beginnings established the basis for the current dental and oral health programs of the Department of Health and Human Services and its Public Health Service. They also led to the resulting assignments of US PHS Commissioned Corps officers to multiple departments. Most recently the creation of the Department of Homeland Security in 2003, and the transfer of the U.S. Coast Guard and Immigration Health Services to that department, has added another department where US PHS Commissioned Corps dental officers are assigned.

The origins of the US PHS also establish the leadership position of chief professional officers. With the formal initiation of the dental section of the Division of Marine Hospitals and Relief, dental chiefs served to oversee the operations that included management of the civilian and contract dentists. The formal position of chief dental officer to advise the surgeon general was established with 1943 and 1944 legislation that modernized the Public Health Service. This position was designed to facilitate dental policy making across the breadth of the expanded PHS divisions and to facilitate interactions with organizations across the federal government and with non-federal agencies and programs. The chiefs of the dental section and the chief dental officers and the deputy chief dental officers served in multiple leadership roles before and after their tenure (Table 1), leading agencies and policy development both within the federal government and beyond, academic and professional, and voluntary organizations. Rear Admiral (retired) John Greene concurrently served as the chief dental officer and as the deputy surgeon general, with Assistant Secretary for Health Julius Richmond.

Table 3: Assignments of the U.S. Public Health Service Commissioned Corps Officers.

Most US PHS Commissioned Corps Officers are assigned to programs in the:

- Department of Health and Human Services
- Department of Justice
  - Bureau of Prisons
- Department of Homeland Security
  - U.S. Coast Guard
  - Immigration and Naturalization Service

In addition, officers have been assigned to:

- Department of Agriculture
- Department of the Interior
  - National Park Service
- Environmental Protection Agency
- National Oceanic and Atmospheric Administration

To address emerging disease and health issues officers also have been assigned to state governments and to international health agencies as needed.

Programs

Oral health programs and activities can be found in most of the organizational structures within DHHS, which fall predominantly under the US PHS (Table 2). These programs continue to contribute to the development and promotion of: oral disease prevention methods, building upon the successes of community water fluoridation and school-based sealant programs, diagnostic tools, expanding imaging technologies and developing salivary diagnostics, and these programs work to refine and redefine therapeutic interventions including biomaterials, implants, and tissue regeneration approaches. Such programs are designed to improve the nation's health from a variety of missions—research, service, education, technical assistance, regulation, and more. They serve to build our knowledge base to inform oral healthcare practice, community programs, and personal behaviors. They apply this knowledge base to address oral health needs of specified populations through direct care services and by funding programs. They provide technical assistance to local, state, and regional dental program directors and provide support for the training of dental health care professionals and for attracting individuals into health careers.

Collectively these programs and activities address the essential public health services of assessment, policy development, and assurance.

Assessment. Assessment includes services such as monitoring health and disease status; knowledge, attitudes, and practices of the public and health care providers; workforce and public health program capacity; and use and expenditures of health care. These services are essential to designing programs and measuring their outcomes. The Centers for Disease Control and Prevention's (CDC), National Center for Health Statistics, and CDC state-based surveys, as well as the surveys conducted by the Agency for Healthcare Research and Quality and the National Institutes of Health, among others, provide key data on oral health. Such measures include oral infections, oral cancer, public knowledge, dental programs, dental

workforce, and dental visit utilization and expenditures. These data alert the nation to emerging trends in health, disease, and healthcare practices, identify areas for program development, and raise hypotheses for further study. (For an overview of oral health-related databases and sources visit the NIDCR/CDC Dental, Oral and Craniofacial Data Resource Center at www.nidcr.nih.gov.)

Policy Development. The federal government's investment in science is a major contributing factor toward policies developed by professional organizations and communities. *Oral Health in America: A Report of the Surgeon General* and the oral health objectives of the Healthy People 2010 initiative, are both examples of the U.S. Public Health Service's role in providing national visibility to the evidence and knowledge generated by science, and in providing measures of the nation's health status among all populations and of public health infrastructure needs (U.S. Department of Health and Human Services, 2000a; 2000b). Most recently *A National Call to Action to Promote Oral Health*, a document generated by a public-private partnership under the leadership of the Office of the Surgeon General, was released by Surgeon General Richard Carmona on April 29th, 2003. This call to action specifies activities that must be undertaken "to advance the general health and well-being of all Americans by creating critical partnerships at all levels of society to engage in programs to promote oral health and prevent disease" (available at www.nidcr.nih.gov).

Assurance. Assuring the health of the public involves the generation of the science base, the translation and application of research findings into practice and for public use, the training of health professionals and researchers, the creation of programs for underserved populations, the provision of services to federal beneficiaries and the assurance of safe and efficacious drugs and devices. The National Institute of Dental and Craniofacial Research, National Institutes of Health, provides major support of dental biomedical and behavioral research and research training. Additional research is supported by the Division of Oral Health, Centers for Disease Control and Prevention and by the Agency for Healthcare Research and Quality. The Health Resources and Services Administration supports programs for dental health professions education, dental care services for underserved populations, rural populations, those with HIV/AIDS, and maternal and child health populations. Oral health services and prevention programs are an integral part of the Indian Health Service.

People

It takes people as well as programs to address the oral health needs of the nation. The workforce includes dentists, dental hygienists, dental assistants, and a large number of non-dental professionals and support staff who contribute to the conduct and support of oral health care services, research, regulatory activity, and program design and administration. These individuals are employed through the civil service, by contract, or are commissioned in the US PHS Commissioned Corps.

It takes people as well as programs to address the oral health needs of the nation.

The surgeon general of the US PHS leads the PHS Commissioned Corps, one of seven uniformed services in the U.S. The mission of the corps is "to provide a highly-trained and mobile health professional force to carry out programs to promote the health of the nation, understand and prevent disease and injury, assure safe and effective drugs and medical devices, deliver health services to federal beneficiaries, and furnish health expertise in time of war or other national or international emergencies." Officers may be assigned to agencies at the federal, state, or local levels or to international organizations to address overarching public health needs (Table 3). At the same time, officers are expected to address PHS-wide needs. For example, officers participate in the Commissioned Corps Readiness Force, established in 1994, and are deployed as needed to address emergency preparedness, domestically and internationally.

Dental officers comprise one of eleven officer categories of the US PHS Commissioned Corps (Table 4). Dental hygienists are commissioned in the Health Services Officer category. US PHS Commissioned Corps dentists and dental hygienists constitute about one-tenth of the 6,000 corps' officers. A career in the U.S. Public Health Service Commissioned Corps offers a wide

Table 4: List of Officer Categories of the U.S. Public Health Service Commissioned Corps.

Dentists
Physicians
Nurses
Pharmacists
Scientists
Engineers
Veterinarians
Dieticians
Environmental Engineers
Therapists

range of career track options. In addition to assignments in DHHS, dental officers in the US PHS Commissioned Corps are assigned to provide clinical services to the U.S. Coast Guard and the Immigration and Naturalization Service, Department of Homeland Security, and in the Bureau of Prisons, Department of Justice. These assignments reflect the historical evolution of the US PHS. In fact the majority of the dental officers who are commissioned in the corps enter upon graduation from dental school and are assigned to either the DHHS, Indian Health Service, the Department of Justice's Bureau of Prisons, or the Department of Homeland Security's U.S. Coast Guard. Together these three service-oriented programs comprise approximately 80% of the dental workforce in the Commissioned Corps. Individuals who have gained training beyond dental school also have entered, although fewer in number, directly into administrative or research tracks.

Short-term training and long-term training opportunities exist. The PHS has accredited advanced dentistry and specialty training programs in general dentistry, dental public health, and oral medicine, and fellowship programs, such as one in infection control, are emerging. Officers also are sent to non-federal programs for needed training. Collaborations with other federal dental services exist and include education programs, as well as research and service programs.

An officer in the U.S. Public Health Service is expected to have a range of assignments that may involve a variety of geographic and agency locations. A career can involve varied and progressive clinical, policy, research, regulatory, or management billets. Although officers may remain in their initial discipline for their entire career, there are opportunities for officers to undertake broad multidisciplinary leadership roles. (Further information on the U.S. Public Health Service is available on www.usphs.gov.)

The Public's Health

Many challenges face our nation's health, and thus the US PHS Commissioned Corps, US PHS, and the Department of Health and Human Services. These challenges include the need to address the health of the rapidly changing demography and resulting health disparities of our population; the ability to control and prevent emerging and re-emerging infections and of health determinants; the need to harness and rapidly transfer science findings into action by the health professions and the public; and the ability to respond to bioterrorism and other catastrophic events. The DHHS and its programs are committed to addressing these challenges, facilitating the private-public partnerships and actions *A National Call to Action to Promote Oral Health*, and contributing to the charge from the ADA's *Future of Dentistry* report that states, "The dental profession must establish a rapid, flexible, and effective response system for predicted and unknown changes in health care delivery, education, and research in the future" (American Dental Association, 2001).

These challenges include the need to address the health of the rapidly changing demography and resulting health disparities of our population; the ability to control and prevent emerging and re-emerging infections and of health determinants; the need to harness and rapidly transfer science findings into action by the health professions and the public; and the ability to respond to bioterrorism and other catastrophic events.

Recommendations from a recent Institute of Medicine study of the future of the public's health provide additional guidelines for program development: adopting population-based approaches to health care, building new partnerships that transcend sectors, establishing strong surveillance and public health infrastructure at all levels, developing systems of accountability, using the evidence-base to make decisions, and enhancing and facilitating communication (Institute of Medicine, 2003). To address these challenges, initiatives, and recommendations we need individuals willing to commit to the many exciting careers available in the federal service and the US PHS Commissioned Corps.

References

American Dental Association (2001). *Future of dentistry.* Chicago, IL: American Dental Association, Health Policy Resources Center.

Harris, R. (1989). *Dental research in a new age.* Rockville, MD: Montrose Press.

Institute of Medicine (2003). *The future of the public's health in the 21st century.* Washington, DC: National Academies Press.

Mullan, F. (1989). *Plagues and politics: The story of the United States Public Health Service.* New York: Basic Books.

U.S. Department of Health and Human Services (2000a). *Healthy people 2010,* (2nd ed). Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services (2000b). *Oral health in America: A report of the surgeon general.* Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health.

U.S. Public Health Service (1994). 75th anniversary of the PHS Dental Corps. Washington, DC: The Service.

Dentistry in the Department of Veterans Affairs

C. Richard Buchanan, DMD

Abstract

The dental mission of the Department of Veterans Affairs includes care, typically hospital care, developing an educated cadre of oral health care professionals, and research. Its innovations emphasize the local nature of care requirements, and it enjoys a tradition of partnering with other branches of the federal services, the American Dental Association, and education.

Since 1930, the mission of the Department of Veterans Affairs (VA) has been to carry forward a promise made by President Lincoln more than a century ago. That promise was a pledge of care and the concern of a grateful nation for the sacrifices made by America's servicemen and women to preserve our freedom. The first and primary mission of VA is to provide excellence in health care.

Care

Dental services are an integral part of the professional health delivery environment of all VA medical centers, free standing outpatient facilities, and many of our satellite outpatient clinics. Although dental care is provided for entitled veterans whose health concerns are solely dental, the operation of VA dental clinics concentrates on providing treatment for veterans who are physically, medically, or emotionally compromised and require dental interaction for management of their medical conditions.

Dental disease is one of the greatest unmet needs of the medically compromised and impaired patient. This is one of the reasons why hospital based training experience is a prerequisite for appointment of VA dentists. VA dentistry provides primary care to our entire spectrum of patients, as well as specialty services when indicated. We feel that it is essential that dental treatment be included as an integral part of the current and future health care delivery system in order to improve and maintain our veteran patients' overall health and quality of life.

That promise was a pledge of care and the concern of a grateful nation for the sacrifices made by America's servicemen and women to preserve our freedom. The first and primary mission of VA is to provide excellence in health care.

Although providing clinical care to eligible veteran beneficiaries is the primary mission of VA dentistry, there is significant commitment to education and research, as well as back up to the Department of Defense (DOD) in times of national emergency. VA dentistry offers a wide range of programs that make it very competitive in the oral health care arena. In addition, many VA dentists have academic and research responsibilities. They do however, spend the majority of their time providing patient treatment made more complex by the nature of the patients' co-morbidities or their biopsychosocial deficits.

Legislatively, the Office of Dentistry in the Central Office holds one of only two positions that are directly under the Under Secretary for Health. The Office of Dentistry is located in Washington, DC and has an Assistant Under Secretary for Health for Dentistry and three dental directors on its staff. The office's responsibility is to develop and disseminate programmatic policy and operational plans for VA dentistry's mission and to provide administrative guidance for the integration of VA dental programs with the

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primary Veterans Health Administration objectives of high quality patient care.

Approximately 75% of VA dentists are general practitioners. Although dental specialists are a necessary part of the treatment team, dentistry in the VA is primary care driven and general dentists provide the bulk of VA dental care. Currently seven hundred and fifty full- and part-time dentists make up the professional dental staff at two hundred and four facilities across the country. Dental hygienists, dental assistants, laboratory technicians, and administrative staff complete the oral health team that provides dental care to many of our nation's veterans.

Recent legislation that provided increased pay for VA dentists has been helpful in recruiting and retaining outstanding clinicians. With increased patient enrollment and the world climate resulting in military call-ups, VA anticipates having to increase its workforce to meet the projected workload demands. With over 1.2 million patient visits last year our dental health care providers are being challenged daily with the rising concern of access and timely care.

Education

A second mission goal is the VA's longstanding commitment to dental education and training oral health care professionals. VA dentistry is affiliated with all U.S. dental schools. These affiliations encompass a wide range of training relationships. Some share staff and faculty in the instruction of dental students and in providing veterans with general and specialty care. Consultive services, provided by recognized dental authorities, bring an additional benefit to VA patients and training programs. Most specialty programs and nearly half of the general practice training programs are integrated with the affiliated dental schools. For these integrated programs, VA provides funding to the school that allows residents to rotate to VA for clinical experiences. The other half of general practice training programs is free-standing, with VA having total responsibility for oversight, accreditation, and financial support.

VA supports three hundred and fifty-six postgraduate training positions nationwide at seventy-two facilities. Resident pay is based on the postgraduate year (PGY) level at the same rate as medical residents at the affiliated medical school. The salary package includes health benefits and paid annual and sick leave. Licensure requirements require a full, current, and unrestricted license to practice in a state, territory, or commonwealth of the United States or in the District of Columbia prior to starting the PGY 2 year.

The richness of VA's environment and the diversity of patient mix create vast research opportunities that demonstrate importance in prevention, diagnosis, and treatment.

Research

A third mission goal of VA is research. Although there are no dedicated funds for dental research, our VA dentists are involved in numerous clinical studies. Much of their effort is done on an individual basis and is carried out in addition to their clinical care duties. VA is participating in several cooperative studies, one in particular with NIDCR, investigating biomarkers for oral cancer. VA has also conducted very large clinical studies in implants, with the principal investigator in Ann Arbor, and he currently has another proposal pending for additional work in this area. The VA dental longitudinal study, in coordination with the normative aging study at the Boston VA, is well known by oral health researchers. A study of panoramic X-rays as an aid in stroke detection has been conducted at our Sepulveda, California, medial center. VA research today is focusing on more clinical studies that target care outcomes and how they can make a difference. The richness of VA's environment and the diversity of patient mix create vast research opportunities that demonstrate importance in prevention, diagnosis, and treatment.

Dentistry has multiple programs that bring heightened awareness to its missions. Two central dental laboratories (CDL), one located in Dallas, Texas, and one in Washington DC, provide dental laboratory support to our dental staff. Most VA dental clinics have their own laboratory technicians for routine lab procedures. The CDLs are responsible for providing those services that require additional expertise or equipment beyond what the facility dental labs can provide. The CDL casework would include construction of partial denture frameworks, porcelain to metal crowns and bridges, veneers, and special appliances. The facility labs are responsible for single full metal crowns and complete acrylic denture work.

The Houston Preventive Dental Center provides fluoride gels, artificial saliva, ingestible toothpaste, and disclosing solution to the dental clinics in the VA system. The center began its work in the early '70s in connection with NASA when it was asked to come up with an ingestible toothpaste for the astronaut program. This project coincided nicely with our efforts to develop a toothpaste for nursing home patients who were not able to rinse. Since then, expansion into the other preventive products for veteran patients has been undertaken.

The Miami Dental Development Center works with the Office of Dentistry in the Central Office to analyze treatment and productivity data. They provide expertise for staffing model development, simulation modeling, workload penetration percentage by patient catchment areas, and year-end roll up of costs versus productivity assessment data. As in most organizations, data are absolutely vital, not only to justify what we do, but for budget purposes as well. The Miami Center plays a key role

in data management and report generation that allow dentistry to demonstrate its important role in VA health care.

Moving toward a complete electronic dental record that fully communicates with the patient's medical record is nearing completion.

Our Homeless Dental Program director resides in Ft. Worth, Texas. She provides not only treatment to homeless veterans but also works closely with the Office of Dentistry. Using her clinic as a model, guidance is sent to other facilities that assists them in implementing the recently passed legislation that covers VA homeless dental patients. Homeless surveys have rated dental treatment as the second most needed service in restoring homeless people back into society and obtaining shelter and gainful employment. The homeless program director also distributes a quarterly Homeless Newsletter that is sent to not only VA facilities but also to homeless organizations around the country.

VA dentistry supports the concept that management should make decisions based on field needs and guidance. Several committees work over and above their clinical duties to provide information to the Central Office so that national guidelines and policy can be developed. The Oral Health Field Advisory Group provides input on clinical issues as well as guidance for coding and data entry suggestions that help them more effectively capture their workload productivity.

Since 1994, dentistry in the VA has evaluated and measured cost effectiveness of its care as compared to what the same treatment would have cost in the private sector. Cost effectiveness templates are prepared yearly for each facility to be used as a management tool to measure productivity and cost efficiency. Peer review is used as one quality check measure. This is a requirement for residency training and has been carried a step further to include staff. Our residents and staff work in an environment that adheres to the strictest protocols for infection control, patient safety, and assurances for quality patient care.

Performance guidelines and the dental service self assessment measure are additional tools that are in place for service chiefs to use to evaluate their clinical operation. In VA, one facility is not measured against another since each facility is different in terms of resources, space, patient mix, and staffing. We measure performance and productivity against a reasonable standard of expected outcomes.

Partnerships

VA actively interacts with other agencies and organizations. We have worked closely with the American Dental Association on several key issues. Their help on the dentist pay bill legislation in 2000 was instrumental in its passage. Our VA Washington, DC dental service hosted a facility visit for Dr. Jones, ADA president and his staff. The agenda included a briefing on VA patient care, tour of the clinic facility and CDL, and an update on VA research and residency training. We are currently working closely with the ADA commissioner to JCAHO concerning the "wrong site" surgery issue. VA has two delegates and two alternates to the ADA House of Delegates and has a representative on the New Dentist Committee.

Commitment to education remains a high priority for VA and our working relationship with the American Dental Education Association remains strong. Over a third of VA staff have faculty appointments at affiliated dental schools, most volunteering time without remuneration. Dental and hygiene student rotations to VA continue to provide a unique educational experience for those who participate. VA has a representative on ADEA's Council of Deans and this encourages a closer working relationship with VA and dental schools.

As a member of the federal services, VA has responsibilities to the uniformed services dental corps. Not only is VA backup to the Department of Defense in times of national emergency, but also we have over two hundred sharing agreements that provide various amounts of dental care to military personnel where it is needed. We meet on a regular basis to discuss common issues and are presently working on a data record system that would be mutually beneficial to both organizations.

VA dentistry has many challenges to face. With shrinking budgets and increasing patient enrollment, proper staffing to provide access and timely care is an issue that must be addressed. Moving toward a complete electronic dental record that fully communicates with the patient's medical record is nearing completion. We are currently working on the imaging and scheduling portion that will soon be integrated into the overall package. Dental eligibility in VA is still a complex problem that will need legislative action and additional dedicated resources to allow more veterans to receive the care they so rightly deserve.

VA's dental providers are proud of the care they deliver to our veteran patients. Similar to other areas of VA, the dentistry program provides a big "bang for the buck." High quality, cost-effective care is delivered to a complex patient population, which would not be easily served by the private sector. At the same time, VA dentists help educate many of the nation's dentists and conduct research that benefits the veteran community as well as the private sector.

Issues in Dental Ethics

Professional Ethics in Dentistry Network

Correspondence relating to the Dental Ethics section of the *Journal of the American College of Dentists* should be addressed to:

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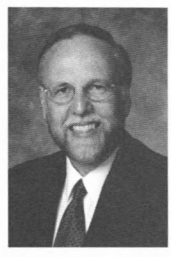
Integrity and Compromise in Dental Ethics

Gerald Winslow, PhD

The integrity of the upright guides them,
But the unfaithful are destroyed by their duplicity.
—The Proverbs of Solomon, 11, 3

A year after I started teaching dental ethics, two, fourth-year students buttonholed me. They had been in my course the previous year, and now they had an "ethical question." Why, they wanted to know, had they been taught what their teachers considered to be the best way to prepare a tooth for a filling and then told to do the preparation another way in order to pass their board examinations? I confessed ignorance. They explained that they were taught to make the inside edges of the preparation rounded. But the board examiners expected to see straighter edges and squarer corners. The difference seemed relatively trivial to me. But it did not seem so to the students. For them, this was a challenge to personal and professional integrity. They were earnest. They explained that the procedure would be done on live patients who expected and deserved the best possible care. How, they wondered, could they compromise what they had been taught, and what they believed to be a better way, in order to pass the licensure examination? It looked to them as if their very entrance to the profession would be clouded with a breach of integrity. It might be a different matter, they allowed, if the teeth being prepped were not attached to a person. I tried to listen sympathetically and promised to see what I could learn. The implication, I suppose, was that I would get back to the students when I could offer a more informed conversation. But I never did. Discussions with seasoned dentists and educators provided a confusing range of answers. One suggested that the students were just "cry babies" who probably could not face the stress of the examination. On the opposite side was a professor of dentistry who said that the students were right; the criteria for the exam were outmoded and ought to be changed. Besides, he opined, the whole process of using patients for board ex-



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This essay was originally presented as the presidential address for PEDNET at its annual meeting in San Antonio, March 9, 2003.

aminations was ethically dubious. More to the middle were those who said there were honest differences about how to prepare a tooth for filling, that none of these methods was clearly superior in light of empirical evidence, and that, in any event, patients would not be harmed by the more conventional preparation favored in the board examination. Even now, more than a decade later, I still find that this issue bedevils some students. I still get roughly the same range of answers from those who should know, and the matter of requiring live patients for board examinations appears, if anything, to be more debated (Hasegawa, 2002).

Small as it may seem, this example of the students' dilemma shares features with many of the ethical issues in dentistry. The students believed they knew what was best for their patients. Care that failed to meet this standard was a threat to their professional self-respect and to their ethical integrity. On the other hand, it was likely that examiners who failed to uphold the customary standard would see this as a threat to their integrity.

Consider the similarity between this example and the ordinary cases that come up so often in discussions of dental ethics:

- The dentist proposes a reasonable set of treatment options for a patient with a seriously infected tooth, but the patient insists on an extraction, even though the dentist believes this would be poor treatment.
- The patient's dental plan will only pay for what the dentist considers inferior treatment, and the patient is not willing or able to pay for more appropriate care.
- The patient needs care now, but she must wait to become eligible for the dental insurance her employer provides.

Like the students in our opening example, it is not clear that all interested persons will be able to find integrity-preserving compromises. Yet, in nearly every case, some solution, even if less than ideal, is likely to be better than nothing.

How is it possible for oral health care professionals to maintain integrity and still engage in negotiation and compromise on matters of professional and ethical significance?

So here is my question: How is it possible for oral health care professionals to maintain integrity and still engage in negotiation and compromise on matters of professional and ethical significance? Related to this central question are others: What should we teach dental students about the role of compromise in ethical decisions? Are some forms of compromise compatible with integrity while others are corrosive of it?

In answering these questions, I draw on the work of philosopher Martin Benjamin and others who have argued that there are good and bad compromises in ethics, some that preserve and some that destroy integrity, some that enhance and some that undermine professional responsibility (Benjamin, 1990; Kuflik, 1979; Winslow & Winslow, 1991). While acknowledging, at the outset, that there is no simple formula for telling the difference, we can identify some of the basic elements of good and bad compromises. And we should help ourselves and our students know the difference. And we should have some criteria for the limits of compromise.

Integrity

In his widely-read classic, *Childhood and Society*, psychiatrist Erik Erikson described what he considered to be the "eight ages" of human development. In Erikson's terms, we are confronted throughout the stages of our lives with a "series of alternative basic attitudes" (Erikson, 1963). The final challenge, Erikson's eighth "age," is presented in terms of "integrity versus despair." The last step of human maturation, he contends, calls for an affirmation of one's own central meaning and values. "The possessor of integrity," Erikson wrote, "is ready to defend the dignity of his own life style against all...threats" (Erikson, 1963, p. 268). By contrast, failure to develop integrity leads to despair. "Despair expresses the feeling that the time is now short, too short for the attempt to start another life and to try out alternative roads to integrity" (Erikson, 1963, p. 269).

Erikson was attending to the integrity of the entire self (or ego), while my focus here is on a central feature of that wholeness, namely ethical integrity. By integrity I mean the virtue of a person whose actions habitually match his or her well-considered ethical convictions. Genuine integrity, then, is a life of wholeness held together by commitment to central values that are worthy of such commitment. Thus, integrity is far more than honesty or truthfulness, though these are indicators of integrity, just as duplicity and insincerity are symptoms of disintegration. The ideal of ethical integrity is constant sincerity of moral purpose. In the words of Stephen Carter, in his book simply titled *Integrity*, "A person of integrity, like a whole number, is a whole person, a person somehow undivided" (Carter, 1996, p. 7).

Obviously, this is an ideal. It is a goal that ordinary persons pursue, but seldom achieve fully. Still, the virtue of integrity remains an essential end for the study of ethics, if this study is more than an intellectual exercise. The purpose of ethics is significantly about establishing appropriate grounds for integrity, aiding in the choice of basic norms, encouraging the development of basic virtues, and fostering the motivation to act by conviction. Ethically healthy communities, including the community of oral health care professionals, should aide new members in the establishment of integrity by nurturing them in the requisite virtues.

Our question here is whether or not the virtue of integrity can make room

for compromises with others whose ethical convictions differ and with whom cooperation is better than conflict.

Compromise

Sometimes bad things happen to good words. Compromise is an example. According to the Oxford English Dictionary, the first meaning of compromise was simply that of "mutual promise" (Murray, 1901). Later, the word came to mean the settling of disputes through reciprocal concessions. But compromise also developed the meaning of being at risk or diminished function, as when we say that a person's health or an institution's security were compromised. Finally, at nadir of its downfall, the word often came to mean the surrender of a person's principles and the loss of integrity.

Given this variety of definitions, it is tempting to avoid any positive use of term in a discussion of ethics. The problem, however, is that for some circumstances no other word better captures the notion of movement toward mutually acceptable, peaceable accommodation on the part of those whose moral views do, in fact, continue to differ deeply. By compromise, then, I mean the accommodation of divergent moral positions through a process of mutual concessions. It is, as Benjamin, puts it, a matter of "splitting the difference."

We could, of course, imagine an environment in which oral health care professionals would never need to consider compromise on matters of ethical significance. We might picture a dentist, for example, who works with a partner who agrees on every question of ethical responsibility. In this practice, all of the employees would also be in similar agreement. The dental hygienists and dental assistants in the practice would be equally well-informed regarding the ethical expectations of their professions; all the oral health care professions would have identical ethical norms; and all the professionals in this utopian practice would be completely willing to follow these norms. Every patient in this practice would share the highest values of oral health and would always give knowledgeable consent for the wisest treatment plans. The patients' decisions would not be alloyed with other ethical considerations, such as the financial responsibility to care for a dependent parent. And all the patients' dental insurance plans would be designed to make the best oral health care available and with copayments patients can afford.

We could go on stipulating the conditions of such a dental utopia, but, from the beginning, even novices in oral health care would recognize that such a world is not ours.

What we do find in a democratic and pluralistic society like ours is a far more complicated and interesting place than the imaginary state of no compromise. It is our normal expectation to find that people will differ in their moral visions, in the values they espouse, the virtues they most admire, and the principles they apply. Even in the oral health care professions, with a relatively high percentage of the members still belonging to their respective professional organizations, we expect to find ethical disagreement. Resolving these differences, or living with them, in ways that do not destroy integrity is the constant challenge of ethical freedom. In the words of philosopher and physician H. Tristram Englehardt, ethics in a pluralistic setting like ours is a "means for negotiating moral intuitions by the use of reasons, not force, within the bounds of mutual respect and freedom" (Englehardt, 1981, p. 127).

By compromise, then, I mean the accommodation of divergent moral positions through a process of mutual concessions.

A Case

What is needed, then, are strategies for sustaining integrity in the world that is presently ours. But before turning to this task, it will be helpful to remember a case that may serve as a prism to sort out some major considerations.

The case I have chosen was written by Gary Chiodo and Susan Tolle (Chiodo & Tolle, 1993). They described the condition of a fifty-four-year-old woman who was insulin dependent and schizophrenic. She had been hospitalized repeatedly in recent months because of diabetic ketoacidosis (DKA). Her physician suspected that her lack of glucose control was exacerbated by her oral infections. She had multiple abscessed teeth and severe oral pain. Her schizophrenia was also poorly controlled. Her hyperglycemia caused nausea and confusion, leading her to discontinue her anti-psychotic medication. Because of poverty and a lack of dental insurance, she had not received regular dental care. And the little dental care she had received had been complicated by her severe dental phobia, necessitating intravenous sedation even for simple extractions, thus adding to the cost of the care. Her husband's employer offered a minimal dental insurance plan that required 50% copayment. Because of her extensive disease, described as fifteen carious teeth with three roots decayed below the gingival crest and significant oral candidiasis, her dentist recommended extractions and dentures. The total fee for this work (at that time) was set at $2510, of which the insurance company agreed to pay $1155. The patient's husband explained that the remaining $1355 was entirely out of reach for this couple of modest means.

The dentist was willing to provide the needed care and accept only the amount that the insurance company would pay. But the insurance company would not allow such an arrangement without significantly lowering the amount they would pay the dentist. The dentist might have considered billing the insurance company without indicating that the copayment would not be charged. But

according to the state's dental practice act, failure to bill for the copayment would have been a serious offense and could have led to the revocation of the dentist's license. This position was (and still is) buttressed by the following rule from the American Dental Association's *Principles of Ethics and Code of Professional Conduct* (2003): "A dentist who accepts a third party payment under a copayment plan as payment in full without disclosing to the third party that the patient's payment portion will not be collected, is engaged in overbilling. The essence of this ethical impropriety is deception and misrepresentation; an overbilling dentist makes it appear to the third party that the charge to the patient for services rendered is higher than it actually is."

So both state law (where the dentist practiced) and the ADA code forbade the forgiveness of the patient's copayment unless an agreement could be struck with the insurance company. The patient's dentist and her physician appealed to the insurance company on the patient's behalf. Their petition was that the dentist be allowed to forgive the copayment if the insurance company would pay the remainder. The physician pointed out that the same insurance company had recently paid over $12,000 in hospital and medical costs that might have been avoided if the patient's oral health problems could have been resolved. Still, the insurance company remained resolute in its refusal to compromise.

Sustaining Integrity

The case is both frustrating and ethically interesting. As presented, there was no acceptable middle ground—no way to split the differences. We could present the case merely from the perspective of the patient or her dentist and make it appear that both the right and the good are on their side. But according to the ADA's norms, forgiving a copayment is not just a quibble about business law. Rather, it is deemed a serious ethical breach to forgive the copayment. So, we do not have the comfort of construing the circumstances in terms of a virtuous, charitable dentist challenging a mean-spirited, ethically bankrupt insurance company. Instead, we have the patient, her husband, her physician, and her dentist, wanting what they saw to be best, as they see it, for the patient. And we have organized dentistry, state law, and the insurance company also using ethical arguments on the opposite side. Thus, the case provides a ready prism to explore the prospects for integrity-preserving compromise.

The failure to imagine more creative, alternative courses of action is often the source of stalemate between integrity and compromise.

To this end, I propose four examples of integrity-sustaining guides when ethical convictions differ and when compromise would be better than impasse. These four are, of course, neither exhaustive nor sufficient. They merely illustrate way marks when we differ from others who believe they also hold ethical positions.

Acknowledging Ethical Complexity. Frank admission of both factual and ethical complexity opens the way for integrity-sustaining compromises. When confronted with ethically perplexing cases, there is a powerful human tendency to make our ethical lives simpler by diminishing some of our own important values while elevating others. A better place to begin is with the recognition of the complexity of the values at stake, including those expressed as ethical norms by persons who disagree with us. Nearly any ethical issue worth discussing is complex. Often, if we are honest with ourselves, and if we can live with the accompanying ambiguity, we will see that we might have come to a different conclusion. Admitting this better prepares us to respect those who honestly differ.

Evidence of the ethical complexity regarding copayments is readily available in the official statements of major health care professions. Witness how they differ. As noted, the ADA forbids the forgiveness of copayments because this is judged to be a form of deception. By contrast, the *American Medical Association Code of Ethics: Current Opinions* (2002) takes the following position: "Physicians commonly forgive or waive copayments to facilitate patient access to needed medical care. When a copayment is a barrier to needed care because of financial hardship, physicians should forgive or waive the copayment." The AMA does warn against fraud or breaking laws. But the waiver of the copayments is plainly encouraged if this would remove a barrier to essential health care.

My reason for pointing out these differences is not to settle the ethics of waiving copayments. I simply want to notice that both views are cast in terms of ethical values. Generous recognition of this fact helps us to acknowledge ethical complexity and may prepare us for an integrity-sustaining search for alternatives.

Imagining Creative Alternatives. Creativity is essential to the process of preserving integrity in the face of ethical conflict. Albert Einstein is often quoted for his observation that imagination is more important than knowledge. It is the human imagination that permits the mind to span the universe of possibilities, and its role in ethics is essential (Johnson, 1994). The failure to imagine more creative, alternative courses of action is often the source of stalemate between integrity and compromise.

Regarding the waiver of copayments, several alternatives come to mind. The dentist could, of course, do the work without fee, thus eliminating the conflict with the law and the insurance company. Or the dentist could simply seek payment from the insurance company without disclosing his plan to waive the copayment and run the risk of disciplinary or legal action. Are there other solu-

tions, perhaps more creative and integrity-preserving?

The course of action that the treating dentist actually did choose may represent better hope for integrity-preserving compromise. He explained to the patient and her husband that he was obligated to bill them for the copayment, but he also told them he understood they might need to make payments over a long period of time, as their resources permitted. This plan was acceptable to the couple. It permitted the patient to get the needed care, without a breach of the ADA code.

Fostering Cooperative Change. Up to this point, I have spoken of integrity largely as if it were a virtue cultivated by individuals alone. But this is hardly the reality. The students predicament about board examinations and the quandary over copayments illustrate the way integrity is achieved, challenged, or lost in social contexts. From the beginning, the qualities necessary for integrity are the gifts of social interaction. Distinctive features of that interaction can either enhance the prospects for integrity or diminish them.

Even a person like Martin Luther King, Jr. who challenged the social norms of his time (and ours) did so with moral resources that were available but ignored in our culture. The lone prophet, calling his or her society to account, is still dependent on reaching into the moral conscience of that society, usually by reminding people of virtues they know but have neglected.

One of the most important functions of professional organizations is to remind members of such virtues. At their best, professional organizations, such as PEDNET (The Professional Ethics in Dentistry Network), provide repositories of guidance that aid members in the development of ethical integrity. But such repositories are not static. They are less like museums and more like savings and loan institutions. Anyone who studies the history of oral health care ethics will note significant changes in ethical outlook regarding such matters as professional advertising or participation in managed care.

To use again the example of copayments, it should not surprise us that some critics would call for change. In their discussion of forgiving the copayment for the diabetic patient, Chiodo and Tolle write: "Organized dentistry and dental insurers need to re-examine patient copayment policy. Allowing individuals to live without needed dental treatment due to financial constraints ultimately costs more and interferes with the best interests of the patient" (Chiodo & Tolle, 1993, p. 116). The authors recognize the dangers of unbridled waiving of copayments. And they propose a compromise, similar to that of the AMA code, which would allow waiving copayments in a limited number of exceptional cases.

Such compromise, in the service of a more comprehensive integrity, would not only require professional cooperation, it would also require a change in organized dentistry's officially stated ethical norms. Change of this sort is not easily accomplished. The ethical traditions of any profession tend to be surprisingly sturdy. And this is generally an asset. But change, if well-considered, may also serve the integrity of the profession and aid the members in achieving greater ethical wholeness.

Last year, for example, Dr. Thomas Hasagawa called for change in the entry-level licensing examinations for dentists. Hasagawa argued that using patients to perform "invasive and irreversible" treatments threatens a number of important ethical values, including respect for the patients' dignity and autonomy and the profession's ethical obligation to put the patients' well-being first (Hasegawa, 2002).

If Hasagawa's arguments were to prevail, the students' dilemma about board examinations would be eliminated. One challenge to their integrity would be removed. But this does not appear likely to happen soon. In a vigorous response to Hasagawa's essay from the American Association of Dental Examiners (AADE), the current examination practices are given strident defense. And the arguments of the AADE are also based on an important ethical claim: "The dental licensure examining community throughout our country is cohesive in the belief that protecting the public from acts or practices that would impair or threaten the health of its citizens is not only highly ethical but has been mandated within boundaries established by our courts and legislatures throughout the United States and delegated to state boards of dental examiners for nearly a century" (Cole & Maitland, 2002, p. 47). Hasagawa, and those who share similar views (Jenson, 2002), might respond that it is not ethical to protect the populace from inept oral health care at the expense of misusing some fellow citizens and at the cost of the profession's ethical integrity.

And so the debate could go on, with little prospect for healthy compromise. However, the outlook for splitting the difference is not so hopeless. In an interesting concession near the end of the AADE's response, the authors admit that, "The time will come, as technology evolves, when clinical examinations using newer testing concepts, a new generation of simulators, or new computer-based methodologies will provide a viable alternative to the use of patients in licensure examinations" (Cole & Maitland, 2002, p. 49).

Of course, if the AADE recognized no power in the ethical arguments against using patients in board examinations, then there would be no reason to anticipate a time when this practice would end. One suspects, however, that arguments like Hasagawa's do have ethical potency and that change will come when organized dentistry finds a better way to balance the competing ethical values.

Setting Limits on Compromise. In *Nichomachean Ethics*, Aristotle describes many of the virtues as representing a balance between the extremes of excess and deficiency—his famous "Golden Mean." So, for example, the virtue of justice is realized when we have neither less nor more than our fair share. But Aristotle also acknowledged that there are limits to this strategy of seeking the middle position: "Not every action nor every emotion admits of a mean. There

are some actions and emotions whose very names connote baseness." Aristotle names emotions such as spite and envy and actions such as adultery, theft, and murder, as examples. There is no ethical middle ground between an excess and a deficiency of, say, adultery. To propose such, he argues, would be ludicrous.

Similarly, we should recognize the ethical strategy of splitting the difference has its limits. We must have some sense of when that line would be crossed and integrity would be eroded. As Kuflik has argued, "The morality of 'pure compromise' is incoherent. If universal mutual accommodation is to be possible, certain claims must be regarded as inadmissible from the outset" (Kuflik, 1979, 45). In this regard, the oral health care professions have an obligation to do a better job of telling the stories of their colleagues who were willing to make personal sacrifices in order to preserve integrity, both their own and that of their profession.

The obvious difficulty is in knowing when compromise should not even be considered. Martin Benjamin is right: "We cannot reduce what is often called the art of compromise to an impersonal algorithmic method or science." (Benjamin, 1990, p. 109). Various attempts to establish non-negotiable rights, such as the American Bill of Rights, the United Nations Declaration of Human Rights, and the American Hospital Association's Patient's Bill of Rights, are highly valuable statements of what should not be negotiated away. But such statements are never enough. They could always be lengthened, and they are always subject to alternative interpretations. Similarly the codes and oaths of oral health care professions prescribe some of the duties and stipulate some of the prohibitions that members of integrity must observe. They can aid in establishing the context for ethical integrity, but they can never substitute for the moral judgments of professionals who have examined their own ethical convictions and are willing to pay the price to live accordingly.

In the end, there is no escape from the complexity of setting limits on compromise. Ethical integrity for professionals will always be a quest carried on in conversation with the rest of the profession and with society. The reconsideration of ethical convictions by both the individual professional and by the profession is a continual process. In this quest, the limits of compromise are reached when we are so certain that a particular course of action is right or wrong that to compromise on that point would be to lose what is central to our sense of ourselves as moral agents.

Ethical integrity for professionals will always be a quest carried on in conversation with the rest of the profession and with society.

Conclusion

When the history of this period of oral health care professions is written, it will not be distinguished merely by what we have learned how to do or by our newest techniques and gadgets. We will also be remembered for the ethical virtues we espoused and taught and the degree to which our actions matched these expressed convictions. We who study and teach dental ethics should help our students and ourselves understand how we can seek integrity in an ethically complex world. Given the constant need to resolve ethical differences through integrity-preserving compromises, it is remarkable that so little attention is given to this skill. By focusing on the complexity of honest ethical differences, fostering greater creativity in seeking resolutions, cooperating more effectively for change in professional ethics, and acknowledging the limits of useful compromise, we may better serve the ethical maturity of the oral health professions. In a word, we may experience more fully both personal and professional integrity.

References

American Dental Association (2003). *Principles of Ethics and Code of Professional Conduct.* Chicago, IL: The Association.

American Medical Association (2002). *Code of Medical Ethics: Current Opinions.* Chicago, IL: The Association.

Aristotle (1975). *Nichomachean ethics*, M. Ostwald (trans.). Indianapolis, IN: Bobbs-Merrill.

Benjamin, M. (1990). *Splitting the difference: Compromise and integrity in ethics and politics.* Lawrence, KS: University of Kansas.

Carter, S. (1996). *Integrity.* New York, NY: Harper Collins.

Chiodo, G.T. & Tolle, S.W. (1993). Cost-containment by third party payers. *General Dentistry, 93*, 113-117.

Cole, J. R. II, & Maitland, R. I. (2002). A response from the American Association of Dental Examiners. *Journal of the American College of Dentists, 69*, 47-49.

Englehardt, H.T. (1981). Health care allocations. In E. E. Shelp (Ed.), *Justice and health care.* Dordrecht, The Netherlands: D. Reidel, pp. 125-131.

Erikson, E. (1963). *Childhood and society*, 2nd ed. New York, NY: W.W. Norton.

Hasegawa, T. K. (2002). Ethical issues of performing invasive/irreversible dental treatment for purposes of licensure. *Journal of the American College of Dentists, 69*, 43-46.

Jenson, L. E. (2002). Is it ethical to involve patients in state board examinations? *Journal of the American College of Dentists, 69*, 39-42.

Johnson, M. (1994). *Moral imagination: Implications of cognitive science for ethics.* Chicago, IL: University of Chicago.

Kuflik, A. (1979). Morality and compromise. In J. R. Pennock & J. W. Chapman (Eds.), *Compromise in ethics, law, and politics.* New York, NY: New York University, pp. 38-65.

Murray, J. A. H. (Ed.) (1901). *A new English dictionary on historical principles*, Volume 1. Oxford, England: Clarendon Press.

Winslow, B. J., & Winslow, G. R. (1991). Integrity and compromise in nursing ethics, *Journal of Medicine and Philosophy, 16*, 307-323.

Errors

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Abstract

Errors are outcomes or patterns of outcomes you don't want to see. They are basically of two types: those that occur naturally as rare outcomes of effective processes and those that signal that the process is not working. The error rate in American medicine is known to be alarmingly large; it has not been looked at in dentistry. A topology of error is presented and it is shown how understanding the conditions that cause error, and thus the prevention of error, can only be developed by recognizing and analyzing error itself.

A simple and serviceable definition of error is an outcome or pattern of outcomes you didn't want to see. There are two kinds. Based on random chance alone, every system -- including the most effective -- occasionally throws a dud. These are called normal errors. Process design errors, the second type, may show little variation but their pattern of outcomes is disappointing. A highly trained, skilled, and experienced orthodontist may, on occasion, have a treatment result that is unexplainably disappointing. A marginally competent dentists who dabbles in orthodontics is more likely to regularly produce mediocre results. The irony is that normal errors are rare and processed design errors are common, but they become embedded in typical practice. We are talking about the distinction ethicists draw between "bad outcomes" and "bad practice." James Reason, an expert in human factors, distinguishes between those things that didn't come off as planned and those things that come off the way they were intended but the design was wrong in the first place. In a malpractice suit, the argument is seldom over the fact of the unfortunate event. The plaintiff tries to establish that a pattern of negligence caused the error, while the defendant tries to show that the regrettable incident was an untoward result of chance.

In health care generally, there is a surprisingly high error level. This essay is about distinguishing between the two types and what can be done to reduce errors that are "designed into" of system of care. Absent a willingness to recognize and learn from errors, the future is likely to have just about as many of them as we do currently.

Ignorance in Error

The following story illustrates the role ignorance plays in process design error. (A famous agricultural college in a large, southern state will remain unnamed for the purpose of this example, despite the fact that large numbers of such stories have been collected and attributed to this source.) A graduate of this school, who had the honor of attending for seven years to earn his BS, returned to the family farm and determined to make a great splash with new scientific knowledge. After studying his notes for months, he flew into action by preparing a hundred and twenty acres of the best soil. He went to the local warehouse store and bought every available frozen chicken, and these he carefully planted head down in neatly prepared rows. In a matter of weeks, it became apparent to everyone nearby that his new crop was a failure. Despondently, he ploughed under the chickens, reread his notes from college, and listened to some pretty strong advice from his neighbors. By next spring, he thought he had figured out the problem. He repeated the process, but this time planted the chickens with their heads up. Again, very poor results. Finally, he swallowed his pride and phoned his college professor to explain his troubles. The professor was an internationally renowned expert in evidence-based chicken farming and he listened attentively. After the young graduate had poured his heart out and the wise expert had listened patiently and confirmed a few facts, the EBCF said, "I think I can help you. Why don't you send me a soil sample."

These are errors of process design, including the professor's research knowledge. The errors are likely to continue indefinitely because neither the graduate nor the professor knows how to learn from the errors.

Error In American Health Care

Flying in commercial airlines is relatively safe. Fifteen years ago, there was one fatality for every two million opportunities. In 1999, that figure had been reduced to one fatality in eight million. By contrast,

over 5,000 Americans died in automobile accidents during the month of the recent Iraqi war. The airline safety record is what is known as an "acceptable risk." One could fly eight hours a day for more than 1,000 years before anticipating involvement in an airline accident.

There is substantial evidence that the complexity of today's medicine adds significantly to the probability that errors will occur.

By contrast, the record in our country's health care system is not enviable. Two recent large studies, one in Utah and the other in New York, established a likelihood of more than 3% of all hospital admissions resulting in some form of adverse incident. Slightly more than half of these unfortunate outcomes were preventable errors. Approximately one in every fifty individuals admitted to and American hospital experiences an avoidable error.

Between 50,000 and 100,000 Americans die in hospitals each year as a result of medical errors. This makes medical error the eight leading cause of death in this country. The total costs of medical errors in hospitals alone is over $50 billion, a dollar amount almost equal to the total of all oral health expenditures in this country each year. It is more likely that an American will die from errors in medication prescriptions than from workplace injuries. Of the adverse events arising in hospitals, about 15% led to death and another 3% result in permanent disability. The most common types of errors are those involving medications, those resulting in wound infection, and technical issues. In a 1981 study of a university hospital reported in the *New England Journal of Medicine,* 815 consecutive patients on a general medical service were examined. Thirty-six percent experienced iatrogenic illness, which is complications resulting from diagnosis, therapy, or other attempts to help a patient.

In the ten years between 1983 and 1993, the death rate due to errors in medication (about 7,500 in 1993) had more than doubled in hospitals and had increased more than eight times in the outpatient setting. These numbers significantly underestimate the significance of medication errors, in carefully monitored hospital setting, the reporting rate for ADEs (adverse drug events) tends to be around 10%.

Most medical errors are preventable. The most common types include technical errors (such as amputating the wrong leg), followed by errors of diagnosis, failure to prevent injury, and drug use errors. While some authorities focus on negligence as a primary feature of medical errors, there is substantial evidence that the complexity of today's medicine adds significantly to the probability that errors will occur.

Medical errors can be substantially reduced if they are acknowledged and if efforts are made to prevent them. For example, in 1980, there were approximately two deaths per 10,000 anesthesias. Twenty years later, the anesthesia mortality rates are about one per 300,000.

Restoring a lesion that should have been remineralized, restoring the wrong tooth, or any of the broad category of actions involved with overtreatment and undertreatment could be regarded as planned errors.

There are no substantial studies of errors in the dental profession—but that is ignorance rather than a source of satisfaction. This does not mean that sound teeth are not restored, perforations do not occur in restorative dentistry, occlusions are not misaligned in efforts to improve them, oral cancer and periodontal diseases go undetected, or that paresthesias do not occur following surgery. It only means that dentistry, as a profession, has not yet addressed these issues.

The Family Tree of Error

Experts in the theory of measurement define error as outcomes that (1) differ from usual results, (2) are unintended, and (3) are unpredictable. (Strictly speaking, the average rate of error over a large number of cases can be measured; what is unpredictable is whether the individual outcome will be a significant unwanted deviation.) A taxonomy of some of the important kinds of error is shown in the accompanying table.

Errors are normally classified as to their significance. Some errors matter a lot, such as adjusting patient medication based on having the wrong chart in front of the provider. Some are unfortunate, such as prescribing penicillin for a patient who is allergic to that drug but neither the patient nor provider knew of such a condition. Sometimes the provider receives an embarrassing warning, such as beginning treatment with the wrong chart and then discovers the confusion.

The first kind of error is a mistake or a preventable adverse event. The patient is injured or future health compromised because of actions taken that should reasonably not have occurred. The standard, of course, is what other practitioners normally do. Preventable adverse events are the stuff of malpractice suits.

The second category, is an accident or "bad result," and should not lead to lawsuits. Although this is an unfortunate outcome, it is unpredictable and not the result of negligence. Any health care pro-

A Taxonomy of Error.

Error is an outcome or pattern of outcomes you didn't want to see.

Types of Error Based on Significance

Mistake, Preventable adverse event	Injury that should not have occurred	Endodontics on a vital tooth
Accident, bad result	Rare but natural injury from acceptable procedure	Paraesthesia following extraction using appropriate techniques
Warning, near miss	Approximation to injury	Drug dosage almost strong enough to cause a side effect
	Unsafe practice that does not convert to injury	Prescribing drugs without checking for allergies

Types of Error Based on Root Cause

Faulty execution	Slip (noticed at time)	Breaking endo file
	Lapse (not noticed)	Billing wrong procedure
Planned error (mistake)	Action produces expected result, but wrong action	Successfully placing implant abutments in thin bone
Design error	Creating systems with high potential for errors	High-productivity practices

vider practicing to an acceptable standard will have the same small likelihood of experiencing such a bad result. It is a random fluke in a system of care that reasonable people would regard as acceptable.

Near misses or warnings, the third category of the significance of error, are events that do not result in injure even though the potential for injury exists. Some experts divide near misses into those that approach a threshold (such as a restoration that comes perilously close to endangering the pulp) and what are called incidents. An incident is an error with potential to convert to injury, but does not because of good luck. Leaving uncovered sharps on a tray or prescribing a medicine without first exploring contraindications are example of incidents.

Causes of error are similarly grouped into three major categories. An error of execution occurs when the intended behavior does not occur as expected. Nicking the adjacent tooth, making a recording error in the chart, or breaking the chain of asepsis are typical examples. When the error of execution is noted at the time it occurs, this is called a "slip." It is called a "lapse" when its occurrence is not noted at the time.

A second kind of error is called a "planned error," sometimes also called a mistake. This happens when an intended action occurred as expected, but it resulted in an injury because a different action would have been the correct one. Restoring a lesion that should have been remineralized, restoring the wrong tooth, or any of the broad category of actions involved with overtreatment and undertreatment could be regarded as planned errors.

The third source of error is system design. Sometimes healthcare systems are organized intentionally in ways that place patients at risk. This might be the case with some reimbursement schemes. Or if an office were staffed in such a way that stress and fatigue were common, the likelihood of error could be anticipated to increase. High production offices, where the dentist moves rapidly from operatory to operatory with only minimal and highly standardized patient interactions are especially prone to error, by design. As organizations become complex, when there is little opportunity to verify ones' own work, and when working alone, error rates increase.

The most common and damaging errors are preventable adverse events that are designed into the healthcare sys-

tem. While practitioners do suffer slips and lapses and education or even discipline are sometimes effective short-term remedies, the greatest potential for improving health safety is in the redesign of delivery systems. Practices that have goals such as high productivity, innovated procedures, or the convenience and comfort of practitioners are seldom designed to optimize patient safety. It is unfortunate in any such office to blame an individual who happens to be standing near an accident when it occurs while the root cause of the accident is really the way the office is structured in the first place.

We currently have no better than antidotal understanding of what the level of error actually is, let alone a working understanding of the principles that would allow us to manage it.

Learning to Reduce Design Error

Because design error is embedded in the structure of organizations, it is difficult to correct. Blaming, admonishing, and even training employees will have little effect. In fact, training intended to conform behavior to standards in the organization can actually have negative effects. W. Edwards Deming, the world-famous quality guru, made a lot of enemies among American executives arguing that failure in management responsibility for system design should not be scapegoated on employees. Because design error is part of the system, it lies buried and may appear in times and locations far removed from the real causes. Design error is sometimes called latent error for this reason.

Another powerful reason why design error is so difficult to correct is that organizations often have biases against recognizing or admitting to error occurring at all. This is especially true in organizations that enjoy high public prestige and where training emphasizes perfectionism. Medicine and dentistry are subject to just such restrictions on the capacity to learn from error.

There are limits to what we can learn from success. If we continuously repeat what has been rewarded in the past (and ignore or explain away any exceptions), we might be called intelligent, but only in a certain limited way. This is the model that behavioral psychologists used fifty years ago to train rats to run mazes and pigeons to play ping-pong. But aping specific behavior, however successful, will probably never be mistaken for professional understanding. One obvious problem occurs when the situation changes. Another problem is superstitious behavior. Dentists may invest in a fancy piece of equipment and observe an increase in the number of new patients entering the practice. They might also fail to notice the fact that many people are moving into the community because of good paying jobs at a new company.

Learning to reduce design error is explained graphically in the accompanying figure. On the horizontal axis are action alternatives, for the sake of simplicity they are limited to two choices. On the vertical axis, are the outcomes. These are also limited for conceptual simplicity to two possible results: success and failure. This kind of arrangement produces four cells; Action A being a Success, Action A being a Failure, Action B being a Success, and Action B resulting in Failure.

Systems that rely on standardization of success produce a shallow kind of learning called "single cell learning." This is rote coping of what has worked in the past, including superstition and rigidity. Since mistakes are buried, denied, or explained away, there is no new information that allows for learning. In fact, there is no way to be certain that the performer actually is in the cell labeled A since the same sort of feedback would be possible in the cell labeled D. Just because we can convince ourselves that what we are doing is successful, we have no insurance that something else might not be more successful.

Quacks are trapped in single-cell logic. They only report their successes, while they explain away failure and achieve at best a superficial and usually superstitious knowledge of the processes they are using.

One-cell learning, "justification," locks people and organizations into patterns of behavior. The conditions needed for flexibility begin to emerge with two-cell learning. There are two possibilities. The number of successes with one approach can be compared against the number of successes with a different approach. In the accompanying figure, the two involved cells are A and D. This is sometimes seen in advertisements and more regularly encountered when dentists compare their work and CE gurus present their cases to establish credibility. The obvious flaw is lack of knowledge about failures. The FDA has begun to require reporting of side effects for therapeutic claims, and some specialty boards demand that candidates for diplomate status show consecutive cases. But it is still a common tenant among professionals that only success matters.

The other type of two-cell learning is based on the comparison between success and failures as they result of a single kind of action (cells A and B). This comparison allows the establishment of either the probability of success (number of successes/number of observations) or the odds ratio for success (number of successes/number of failures). This kind of information is important for policy making and for informed consent. However, it is incomplete. It is like running an experiment with no control group.

The only way to understand disease processes and approaches to managing them, to identify which technologies work, and to gain insight into the error that impedes progress in health care is to consider the successes and the failures for multiple courses of action. This is called four-cell learning. By considering

the full picture, professionals can break the grip of empiricism -- habits that cannot be separated from their context. Only when all four cells are considered, is it possible to understand why something works in addition to knowing whether or not it will work.

Understanding Error

This essay began by demonstrating that error in medicine is surprisingly high and costly while error in dentistry has been ignored. It was further argued that the most common sources of error are design features of delivery systems that are largely invisible to professionals. They are woven in the fabric of healthcare delivery in such ways that they cannot be studied in isolation. Obviously, error should be managed at an acceptably low level, but we currently have no better than antidotal understanding of what the level of error actually is, let alone a working understanding of the principles that would allow us to manage it. Compounding our lack of knowledge is a generalized fear among professionals of error itself. It is something that we prefer not to talk about. There is a contest between the self-image of a professional and the rights of patients. As one wag explained the enviable and ever improving safety record of airlines, the pilot is always the first person on the scene of an accident.

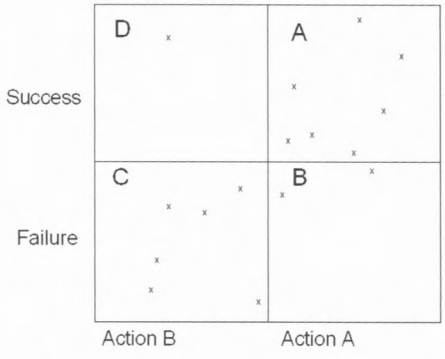
The Institute of Medicine, a sister organization with the National Academy of Sciences, has addressed the issue of error reporting in a useful fashion. They distinguish between serious preventable errors (those involving negligence and significant injury) and errors of all types that are not serious. The IOM recommends that serious preventable errors be reported in a mandatory fashion and not anonymously. They recommend that all other errors be reported on a voluntary and anonymous basis and that they would be aggregated and analyzed in an effort to improve safety. This type of structured learning from the experience provided by accidents and near misses (four-cell learning) can be done in dental offices and hospitals, or it can be done by specialty groups.

There are two significant advantages in accumulating and analyzing anonymous error reports. First, errors tend to be rare and complex. Large databases are needed to understand such events.

Sometimes, the lack of accurate databases on random errors that could be created based on anonymous error reporting leads to credibility contests in courtrooms.

Secondly, norms can be established to help distinguish between "bad outcomes" and preventable errors. It is indeed unfortunate when practitioners are sued because patients don't like the outcomes, even when the outcomes are normal, but rare, events based on the random nature of the well designed processes used. Sometimes, the lack of accurate databases on random errors that could be created based on anonymous error reporting leads to credibility contests in courtrooms.

Figure. Four-Cell Learning



The small Xs represent outcomes demonstrating a principle that Action A is successful but not in every case. The Xs in cells B and D are "normal" error.

In addition to an office or dental group system for anonymous reporting and analysis of accidents and near misses, there are two other methods of four-cell learning that individual practitioners may wish to consider. First is the Japanese practice of *gembutsu*. In this method, those involved in a process regularly perform detailed autopsies on their failures. In manufacturing, assembly line workers would set aside defective parts and, for example, once a week, spend several hours in detailed analysis of the failures. Such analysis can lead to changes in parts, processes for assembly, training for workers, changes in work conditions, or even decisions no longer to manufacture such parts. The analogy in medicine is mortality and morbidity conferences. It is uncommon for a dental team to analyze failures in a systematic fashion. A possible exception is the study club. Perhaps, once a week, the morning huddle should be changed to an afternoon meeting where the goal is to explore ways to improve the design of dental delivery to reduce errors.

The final suggestion for four-cell learning to reduce errors concerns the use of data contained in near misses. One advantage is that there are usually a lot more near misses than either bad results or preventable injuries. This means that more information is available for analyzes. Secondly, no actual damage need occur before signaling that the system is in need of attention. Although people still get defensive when potential errors are identified or when performance drifts close to the trigger point for error, this is still a useful and relatively less expensive and less threatening approach to error prevention.

Recommended Reading

* Einhorn, H. J. (1980). Learning form experience and suboptimal rules in decision making. In T. S. Wallsten (Ed). *Cognitive Processes in Choice and Decision Behavior*. Hillsdale, NJ: Lawrence Erlbaum.

Outcome information without knowledge of the task structure can be irrelevant for providing self-corrective feedback about poor decision rules. Considering two actions and two outcomes (success and failure), single-cell or two-cell learning will be distorted and lead to superstitious behavior. Only reflection on the outcomes in all four cells leads to true learning.

* Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.) (2000). *To Err is Human: Building a Safer Health System*. Washington, DC: National Academy Press. ISBN 0-309-06837-1; 288 pages: about $40.

This is the report of the Institute of Medicine's Quality of Health Care in America Committee. A national panel of experts assembled and analyzed evidence on safety in the American healthcare system, particularly in hospitals. The results show significant shortcomings. The reports addresses the extend of the problem, reasons for errors, the role of leadership and public concern, voluntary and mandatory reporting, and creation of standards. The committee makes eight recommendations.

Imai, Masaaki (1997). *Gemba Kaizen: A Commonsense, Low-Cost Approach to Management*. New York, NY: McGraw-Hill. ISBN 0-07-031446-2; 354 pages; about $25.

Kaizen is the spirit that whatever you are doing could be done better. *Gemba* is the place where the action is -- "on location" (the operatory in a private office, the clinic in a dental school). The principles are (a) housekeeping (self-discipline that shows in the orderliness of the workplace), (b) elimination of waste -- anything that does not contribute to value added, (c) standardization -- both in the sense of a patterned way of responding and in the sense of meeting standards. A glossary is provide at the beginning which defines frequently used terms, including *gembutsu*, that are foreign to Western readers.

* Norman, Donald A. (1988). *The Design of Everyday Things*. New York, NY: Basic Books. ISBN 0-465-06710-7; 256 pages, about $16.50.

Very readable little book that describes common design flaws in everyday items. For example, which side of the hotel lobby door are you supposed to push -- or do you have to pull? Among the principles Norman proposes to improve design are (a) making things visible, (b) simplify operating requirements, (c) designing tools that are easy to use the right way and uncomfortable to use the wrong way, (d) locking out undesirable action (such as starting your car when it is in gear), (e) design effective recover from inevitable errors, and (f) standardize actions surrounding equipment use.

Reason, James (1990). *Human Error*. Cambridge, England: Cambridge University Press. ISBN 0-521-31419-4; 302 pages; about $20.

A blend of the formal research literature in psychology and technical reports from industry, mostly case studies of accidents at nuclear power plants. The author argues that there are different kinds of errors which occur for different reasons and can be mitigated in different ways. Error results from a mismatch between the expected pattern of behavior and the requirements of the environment. Although this mismatch can be understood from an analysis of the patterns of human response (based largely on familiarity and similarity), the best forms of prevention are in systems design.

Shewhart, W. A. (1931). *Economic Control of Quality of Manufactured Product*. New York, NY: D. Van Nostrand. [Republished by the American Society for Quality Control on its fiftieth anniversary in 1980]

This is the book that launched the quality movement. It is about building telephones, sampling, and statistics. But this is the first clear presentation of the difference between normal error that occurs by chance in well-run systems and error that results from problems in the design of the system.

Editor's Note

Summaries are available for the three recommended readings preceded by asterisks. Each is about four pages in length and conveys both the tone and content of the original source through extensive quotations. These summaries are designed for busy readers who want the essence of these references in fifteen minutes rather than five hours. Summaries are available from the ACD Executive Offices in Gaithersburg. A donation to the ACD Foundation of $15 is suggested for the set of summaries on errors; a donation of $50 would bring you summaries for all of the 2003 leadership topics.

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