

INTRODUCTION

The United States Air Force Dental Service, which was created in July 1949, has not only successfully met the challenge of supporting the mission of the Air Force but also made significant contributions to the profession of dentistry. Air Force dentistry originated in World War II with support of the Army Air Forces. Almost two years after the creation of the Air Force in September 1947, the Air Force received its own Dental Service, a component of the Air Force Medical Service. For fifty years, evolving from aviation dentistry to aerospace dentistry, the Air Force Dental Service has fulfilled its mission of providing oral health to Air Force personnel worldwide.

The commitment of Air Force dental leaders to training and education has made the Dental Service a standard-bearer in post-graduate dental education. Key centers of dental education are located at Wilford Hall Medical Center, Lackland AFB, Texas, and at the Air Force Medical Service's School of Healthcare Sciences at Sheppard AFB, Texas. Furthermore, during the 1950s researchers at the School of Aerospace Medicine at Randolph AFB, Texas, created new technologies for the diagnosis and prevention of dental disease. In the early 1960s, when the School of Aerospace Medicine transferred to Brooks AFB, Texas, Air Force dentists began to meet the challenge of providing support to the nation's manned space programs. In the late 1970s, the new Dental Investigation Service at Brooks AFB began to contribute valuable new knowledge on safe dental working conditions and infection control. Air Force dentists have expanded the diagnostic repertoire of oral pathology and helped create the standard protocol for forensic identification in mass disasters. Dental support of the Air Force mission has sometimes been achieved only with high human costs, as shown by the deaths of several Air Force dentists in the Vietnam War.

MISSION

Preparing the Air Force for war is basically the mission of all those who wear the blue suit. Air War College studies emphasize “that people are the decisive factor in war,” and people must be healthy to operate the sophisticated machinery of the modern military.

Twenty-first century technology can be instrumental in decisive victory, but it still takes people to assemble, maintain, and utilize the specialized equipment. The mission of the Dental Service is to make sure the troops are healthy enough to perform their duty. Air Force personnel are required to have a high degree of oral health, allowing them to be eligible for worldwide duty. From its inception, Air Force dentists have provided not only routine dental therapy, but have been challenged to provide dental support in various environments, including the extreme conditions of combat and the exploration of space.



Air Force dentistry participated with skylab training in early 1970s.



Preventive dentistry instruction at Lackland AFB, Texas



Air Force dental care given to Vietnamese villagers.

MISSION

“The cost of maintaining the Dental Corps is small when compared with the relief from suffering obtained and the greater efficiency of the officers and men who have received the service of the dental surgeons. Good teeth are an essential factor in maintaining the general health of our troops, and the dental surgeon has become a necessity to the Army.”

Surgeon General’s Report to the Secretary of War, 1902.



Dental Laboratory Technician in training



Air Force dental officer Arden Christen promoting anti-tobacco use in early 1970s.

“It was conservatively estimated that 90% of Air Force inductees in 1951 had extensive oral defects, and it is readily realized that the dental mission represents a continuing and monumental task. “

USAF Medical Service Digest, July, 1954.

MISSION

“It is startling to realize that for every 100 inductees into the service, the Armed Forces provide 500 fillings, 80 extractions, 25 bridges, and 20 dentures. The magnitude of the military dentists’ mission can be readily appreciated.”

Congressman Paul G. Rogers, speaking to National Dental Health Congress in 1969.



Polaroid photo of Air Force inductee.



The Dental Investigation Service at Brooks AFB, created in 1976, provides valuable information to the military and the profession.

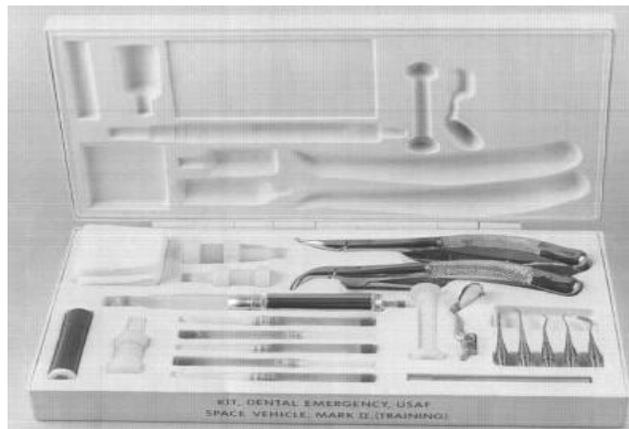


Air Force oral researchers, Norman Harris and Jack Hartley, at Randolph’s School of Aviation Medicine in the 1950s. The inscription Volanti Subvenimus means “we support the mission.”

MISSION



Air Force dentists provide important forensic identification assistance in air mishaps and mass disasters.



Original dental kit designed in the 1960s by USAF dentists for space flight use.

“The mission of the Air Force Dental Service is to provide a continuing and complete oral health service, worldwide, in support of the medical military mission.”

Major General James S. Cathroe, Assistant Surgeon General for Dental Services, on the 10th Anniversary of the Air Force Dental Service.

ARMY DENTAL HISTORY

In 1864, the American Dental Association sent Dr. S.S. White to Washington with the express purpose of meeting President Lincoln and securing his advice, “as to the direction in which efforts should be made to secure for the soldier such attention to his teeth as might be necessary to preserve his efficiency.”

George Washington had dental problems most of his adult life. As Commander of the Colonial Armies, he was treated by several civilian dentists during the American Revolution.

During the Civil War, the South conscripted dentists for service, requiring them to provide their own instruments. Many potential recruits were turned down from military service because they lacked six opposing front teeth needed to bite off the end of the powder cartridge utilized with muzzle loaded firearms. In 1864 the American Dental Association sent representatives to Washington with the express purpose of meeting Lincoln and securing his advice, “as to the direction in which efforts should be made to secure

for the soldier such attention to his teeth as might be necessary to preserve his efficiency.” Lincoln referred the request to the War Department, but unfortunately, no changes occurred during the war.

The actual birthplace of Army Dentistry took place at West Point before the Civil War. The Academy had employed the occasional services of visiting dentists since 1825 as needed for the cadets and officers; however, the first dentist in uniform was Dr. William Saunders. He served the needs of that institution for almost fifty years, starting in 1858 as a hospital steward. Because of his prior dental training in New York City, (probably as a preceptorship), he was called upon to treat patients with dental complaints. In

1872, he became the Army’s first regular dentist occupying a dental room within the hospital at West Point.

During the Spanish-American War in 1898, reports surfaced of



*William Saunders,
the Army's first dentist.*

SIGNIFICANT DATES

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|-------|--|
| 1770s | George Washington had civilian dentists assigned for his dental needs. |
| 1864 | South conscripted dentists. |
| 1872 | Army’s first regular dentist employed at West Point. |
| 1901 | Army Dental Corps comprised of civilian contract dentists established . |
| 1911 | Army Dentists to be commissioned as 1st Lieutenants. |
| 1912 | Navy Dental Corps established. |
| 1917 | “Dentists Bill” assured Dental Officers given same rank and pay as Medical Officers. Dental Section established within Surgeon General Office. |
| 1942 | Dental Section within the Office of the Air Surgeon created. |
| 1947 | Air Force created. |
| 1949 | Air Force Dental Division established on June 8. Dental Service established on 1 July, as a component of the Air Force Medical Service. |

ARMY DENTAL HISTORY

President McKinley signed Act S.4300 in 1901, establishing a corps of civilian contract dentists “to increase the efficiency of the military establishment of the United States.”

TOMBSTONE EPITAPH:

William Saunders
Born 1835-Died 1906

For Forty Nine Years Hospital Steward Dental Surgeon and Undertaker at the Military Academy. Simple and Genial of Life. A Generous Unswerving and Discreet Friend. He has Served the Living and the Dead of Generations of West Pointers.

poor oral conditions among the troops in Cuba and the Philippines. President McKinley soon thereafter signed a bill authorizing a corps of civilian contract dentists attached to the Medical Corps: A ratio of about one dentist per 3,000 troops and no more than thirty total to be employed with a salary of \$150 a month.

In 1906, the ADA formed a committee to propose Army and Navy Dental Legislation. The fruits of this were quickly realized with congressional legislation in 1911 allowing for dentists to be commissioned as first lieutenants and to “respond to any call or service in time of war or impending national crisis.”

When America entered the first

World War, less than 100 dentists were on active duty, and would be tasked to command the rapid addition of several thousand dentists from the reserves to active duty. The Defense Act of 1916 and the Dentist’s Bill of 1917 assured that Dental Officers would receive the same pay and allowances as well as rank and promotion as Medical Officers. In reality, this did not always happen. During the war, approximately 4600 officers served in the Dental Corps, only nine of whom were full colonels. Almost 1500 had been called to active duty as enlisted men.

Enemy action took the lives of seven American dental officers and seven dental assistants during WWI, who often served as surgical assistants during battles. Eight dentists died from disease. Combat activities resulted in 36 dental personnel wounded. American Expeditionary Forces treated 1,396,957 dental patients.

WWI caught most armies unprepared, without adequate, if any, dental contingents to serve the needs of their personnel. For example, the British Expeditionary Force had no dentists at the start of the conflict and less than one thousand at war’s end. Since that time, dentistry has played a greater role in all nations’ armies.

Dr. John Hyson, an Air Force dental officer during the early 1950s, is now recognized as the Army’s Honorary Dental Historian. His many outstanding publications regarding military dental history are classics, based on countless hours of detailed research.



Dr. Kennebeck entered WW I as a 1st Lieutenant in 1917 serving as a dentist. He remained with the Army until 1949, at which time he became the Air Force’s first Assistant Surgeon General for Dental Services.

The famous German surgeon, Langenbeck, at the end of the war stated, “I will never go to war again without the dentist.”

WORLD WAR II

Even before America's entry into the war, the Selective Service System was confronted with the unfortunate reality of many rejections of draftees due to dental defects. The President of the American Dental Association in August, 1941, stated that it was a "grave concern to the military." President Roosevelt in October, 1941, speaking to the Secretary of War, stated that he hoped to "salvage 100,000 men with correctable dental defects out of 188,000 rejected."

Congressional debate resulted as to whether or not the federal government should reimburse civilian dentists for work performed to make a recruit eligible for induction or have the armed forces dental personnel responsible for upgrading the oral health of its inductees. The latter option was selected with the result of an urgent, massive need to expand the number of military dentists. It was decided to have as much dental rehabilitation during training as possible rather than later in the field. Consequently, the majority of dental officers would be stateside; however, it remained necessary to have a considerable number sent overseas.

Over 18,000 dentists served in the Army during WWII. The Army Air Corps dental component increased from 400 to 4,000 during the course of the war. Some not only deployed with units engaged in combat, but a number were wounded, taken as prisoners of war, and killed in action. Due to the military urgency in early 1942, many soldiers were deployed who were in bad shape orally. Reports in the South Pacific indicate that some units had perhaps 80 percent

of the men arriving in need of some form of dental therapy. Those dentists assigned to those theaters of operation would be challenged to meet the needs of the troops in their units.

Divisions of 15,000 men generally had twelve dentists assigned to

them — one major, the rest captains and lieutenants. But there were unfortunate instances of one field dentist being responsible for three to four thousand troops. That was not good for the combat mission.

DENTAL SUPPORT OF ARMY AIR FORCES

The following quotes are taken from the book *Medical Support, Army Air Forces in World War II*. They provide evidence that the dental component was consistently underestimated in its valuable support of the mission.

- ◆ "Because of insufficient dentists, patients could not be kept in a state of satisfactory dental health for even a short period of time."
- ◆ "Dental officers were often overworked and had inadequate equipment."
- ◆ "Dental officers were without a doubt one of the most overworked groups in the theater."
- ◆ "The shortage of dental personnel during the course of the war was, perhaps more pronounced than was the shortage of medical personnel."
- ◆ "The dental situation was probably causing the Medical Department 'more concern' than any other problem during midsummer 1943."

OUR BEGINNINGS

CREATION OF DENTAL SECTION WITHIN THE AIR SURGEON'S OFFICE

There were no Dental Corps personnel assigned to the Surgeon General's Office prior to WWI; however, in August of 1917, the Dental Section of the Personnel Division, SGO, was organized. This created administrative difficulties for the Dental Corps because all activities and recommendations had to be cleared through the Personnel Section prior to reaching the Surgeon General. It was renamed the Dental Division in 1919.

Not much changed significantly until the hostilities of WWII, at which time, the director of the Dental Division stated "such clearance required too much time when time was at a premium." By the end of the war, the Army Dental Corps would have more independent status within SGO. During the war, the Dental Director repeatedly urged more dental representation within other divisions of SGO where dental concerns were voiced, notably, the Office of Air Surgeon. Up until WWII, no dentists were assigned to that office.

With the introduction of high altitude flying in the late 1930s, dental complaints had become more evident among aviation cadets. The following statement appeared in aircrew reports, as well as a few independent studies in the dental literature: "The use of airplanes known as American fortresses at a great height has brought up the problems of flying in the stratosphere....Badly filled teeth ache at 25,000 feet, and so the crews require the regular attention of a dentist." It was evident that the Army Air Corps needed to explore this area more closely. On June 28, 1942, a Dental section within the Office of the Air Surgeon was created, and Lt. Col. George R. Kennebeck was assigned as deputy of the new section. This was the beginning of the Air Force Dental Service that would not be officially

established until 1949.

The Army Dental Section, SGO, would continue to coordinate procedures and policies for the Army Dental Corps as a whole, but it would no longer act on peculiar problems related to the Air Corps. Dr. Kennebeck's new division would basically be responsible for supervising dental personnel assigned to Army Air Bases. Soon promoted, Col. Kennebeck would remain in this position throughout the war and continue until the U.S. Air Force Dental Division was created within the Surgeon General's Office on June 8, 1949. The following month, Brigadier General George Kennebeck became the original Assistant to the Surgeon General for Dental Services.

"The use of airplanes known as American fortresses at a great height has brought up the problems of flying in the stratosphere....Badly filled teeth ache at 25,000 feet, and so the crews require the regular attention of a dentist."



Col. George R. Kennebeck, assigned as the first deputy of the Dental Section at the Air Surgeon's Office during WWII.

AVIATION DENTISTRY

The origins of aviation dentistry began during the first World War with concerns about removable prosthetic appliances and their potential hazards during flight. Additional questions were raised as to the effect of decreased oxygen levels on gum tissue and a possible increased incidence of periodontal abscesses among aviation personnel. Throughout the 1920s and 1930s, as flying attained higher altitudes, the incidences of tooth complaints became more prevalent.

The problem was magnified with the introduction of the B-29 Flying Superfortress to the Air Force arsenal in 1942. High altitude flying and its effects on airmen had become a very viable concern to the Air Surgeon's Office.

Col. George R. Kennebeck, Deputy of the recently created Dental Branch within the Office of the Air Surgeon, sent a letter in April, 1943, to those Army Air Stations conducting altitude training, seeking information as to the effects of decreased barometric pressure upon dental tissue. Response showed

“Aviation dentistry, for the most part, is merely good dentistry.”

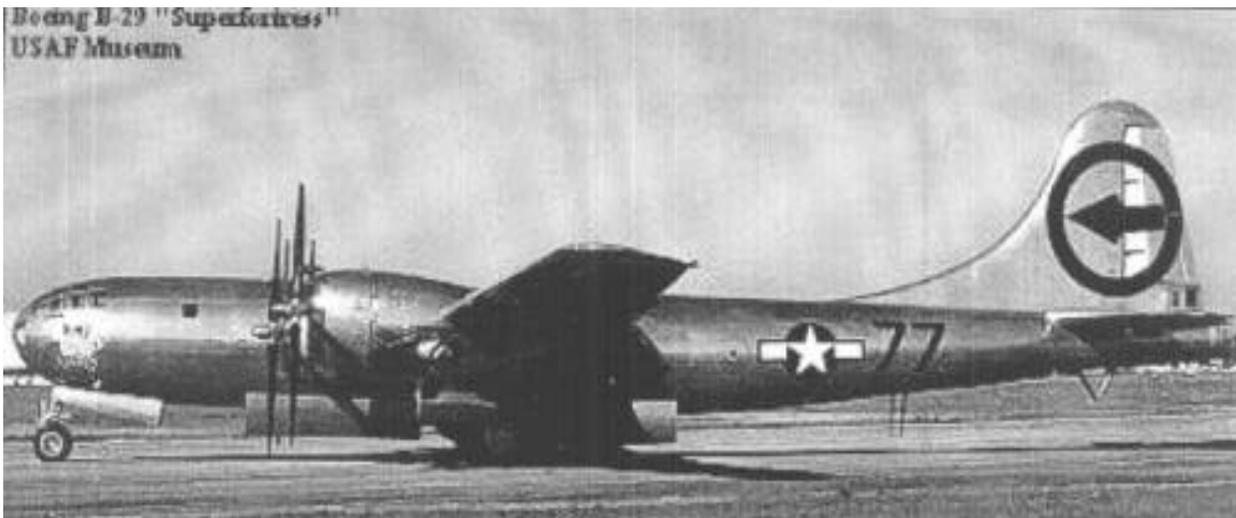
*Captain David F. Mitchell, 1945
first dental officer assigned to study aviation
dentistry at Randolph Field's School of
Aviation Medicine*

widespread interest, but very little knowledge on the subject.

A position was established in the Medical Safety Division, Office of Flying Safety, for Capt. Kermit F. Knudtzon, DC, to evaluate the data. In December, 1943, a dental questionnaire was sent to 200 Army Air Bases to further determine if indeed there were dental problems encountered at high altitude flying. Questionnaire replies indicated problems were evident and further investigation and research were necessary. A team of eleven dental officers selected from bases throughout the country under the supervision of recently promoted Maj. Knudtzon visited about twenty-five dental installations whose findings warranted study.

On May 18, 1945, at Randolph Field, Texas, the Department of Dentistry, Army Air Force, School of Aviation Medicine (SAM) was created to serve in a research and teaching capacity. Capt. David F. Mitchell was the first dental officer assigned there. Two of the earliest projects completed by June of that year were “Bibliography of Aviation Dentistry” and “Effects of Oxygen Decompression on Saliva.”

During WWII, there was close cooperation between the military and civilian sector regarding Aviation Dentistry. Correspondence between civilian universities, research institutes, and governmental agencies such as the Dental Research Section of the



AVIATION DENTISTRY



National Bureau of Standards, as well as the military was opened. Information was disseminated quickly in the dental literature. The first conference on Aviation Dentistry was held in February, 1945, with equal representation by the military and civilian sector. Col. George Kennebeck, Maj. Knudtzon, and Capt. Mitchell were in attendance.

Dental researchers at SAM sought to determine any effect flight conditions had on oral tissues, dental appliances, and dental restorations. Questions were raised as to the effects of decompression, prolonged exposure to oxygen, and prevention of tooth problems when flying at altitude. Capt. Mitchell's essay "The History of Aviation Dentistry with Emphasis on Development in the Army Air Force during World War II" is a classic that has stood the test of time. Even before the conclusion of the war, terms such as "aeronautical dentistry" as well as "aerodontalgia" were being used. Mitchell is credited with coining the use of "aerodontalgia."

Research concerning the effects of low barometric pressure on

oral structures revealed that no new dental pathology resulted from this altered environment; however, about one to three percent of airmen experienced aerodontalgia, at times quite severe, sometimes resulting in an aborted mission. Obviously, air crew commanders wanted an answer. It was often attributed to pre-existing sinus conditions, untreated dental pathology, or faulty existing dental treatment. Pilots also showed a higher incidence of periodontal disease; however, it was determined that gingival tissue, whether normal or inflamed, is unaffected by low atmospheric pressure.

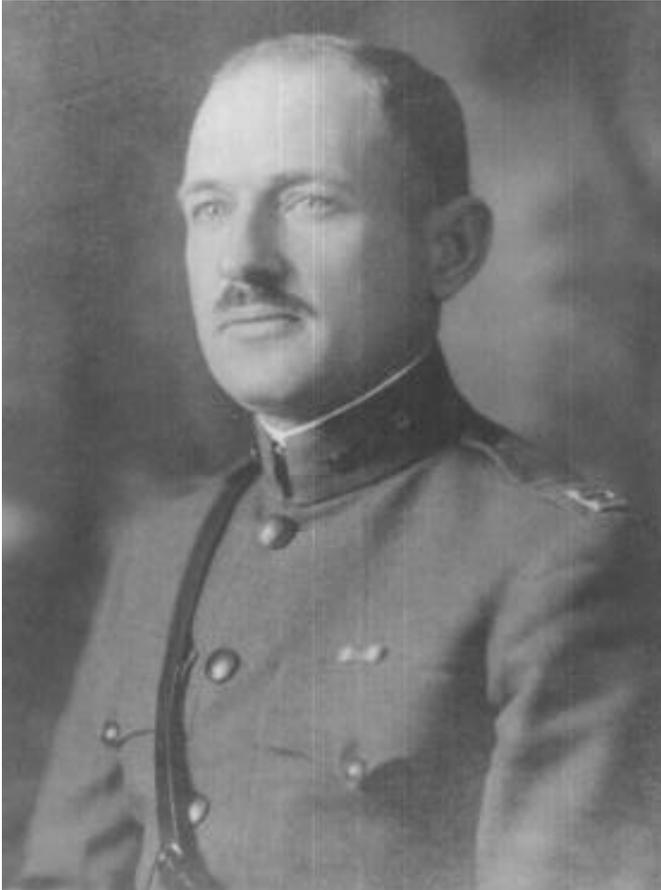
In subsequent decades, pressurized aircraft and flying suits helped decrease the incidence of aerodontalgia; however, airmen continued to have occasional complaints. Re-

search continued, often asking the same questions with the term "barodontalgia" becoming more prevalent in the dental literature. Studies in the 1970s concluded that multi-rooted teeth with partial vitality (one or more roots may be non-vital) was a major cause of barodontalgia.

For fifty years, the dental corps has striven to prevent the occasional toothache encountered during flight, but for the most part, not much has changed, in that prevention seems to be the best cure.

About one to three percent of airmen experienced occasional toothache while flying at high altitude during World War II, sometimes severe enough to cause a mission to be aborted.

GEORGE R. KENNEBECK



Captain Kennebeck, early 1920s.

School in 1916, during which time he had participated in our nation's newly created ROTC program. His private practice days were short-lived because within a year he was conscripted into the Army in 1917. Commissioned as a first lieutenant, he spent his war years at Fort Dodge, Iowa.

After the surrender of Germany, Dr. Kennebeck remained with the Army and was stationed in the Washington DC area for a short time. In 1918, he had the unique experience of serving in one of our country's lesser known military ventures. The United States sent a contingency of troops to Siberia in support of the white Russians opposing the Bolsheviks and their revolution. He was one of two dentists to deploy to Vladivostok from 1918-1919.

Part of his duty there included doing dental work for Russian elected officials as a political goodwill action by the Americans. Shortly thereafter he spent a year in Manila before being stationed in the Washington, DC, area.

In the early 1930s, Major Kennebeck was honored to be

The skills of a true leader were exemplified during Dr. George R. Kennebeck's decade long tenure as the head of the dental corps during its transition from the Army to the Air Force. His distinguished career as a young military dental officer in the field to his organizational and visionary leadership in Washington makes him perhaps the most influential person in the history of the USAF dental corps. He indeed should be called the "Father of the Air Force Dental Corps."

George Kennebeck graduated from the University of Iowa Dental



Dr. Kennebeck, (back row, 2nd from right), was one of two dentists deployed to Vladivostok from 1918-1919 with a contingent sent in support of the white Russians.

FATHER OF AIR FORCE DENTISTRY

invited back to his alma mater as an ROTC instructor at the Iowa Dental School. Other assignments included Panama, Mitchell Field on Long Island, and Camp Davis in North Carolina, where he received orders to return to Washington D.C. in 1941.

In January of 1942, he was selected to command the newly created Dental Section within the Air Surgeon's Office, tasked with handling the dental concerns of the Army Air Corps. Soon promoted, Col. Kennebeck also coordinated the establishment of the Office of Flying Safety within the Medical Safety Division. Its immediate emphasis was to research dental complaints at high altitude flying. He also created a position for a dental officer at the School of Aviation Medicine at Randolph Field, San Antonio, Texas, to study aviation

Service. He was joined by Lt. Col. Walter J. Reuter, who had participated on Col. Kennebeck's staff in the Air Surgeon's Office at the close of WW II, but had since served as base dental surgeon at Bolling AFB. At General Kennebeck's request, Dr. Reuter was chosen as his sole companion dental officer at HQ USAF Dental Division during those busy transition years. Their organizational skills helped navigate the Dental Service through those challenging early years. It was not surprising that they accomplished so much as a

team in such a short period of time, given the fact that they had such a strong working rapport with each other. According to Dr. Reuter, the general was very approachable and receptive to ideas, an astute listener, and one who was also very decisive with a balanced sense of discernment, "one who could assign tasks in gentle, concise terms in a very encouraging manner...." Dr. Reuter also emphasized, "...he was very bright, possessed high ethical standards, [was] a pleasure to work with, and, I believe, the finest officer I ever worked with."

"he was very bright, possessed high ethical standards, a pleasure to work with, and, I believe, the finest officer I ever worked with."

dentistry.

At the close of the war, Col. Kennebeck remained as deputy of the new division, being promoted to Brigadier General in April, 1948. When the Air Force Dental Division was officially formed in June, 1949, he was selected to become its first commander with the title "Assistant for Dental Services." He was promoted to Major General in July, 1949, on establishment of the Medical



Major General George R. Kennebeck, 1950, original Assistant for Dental Services, USAF. Since 1960, the title has been "Assistant Surgeon General for Dental Services, USAF."

ESTABLISHMENT OF U.S. AIR FORCE DENTAL SERVICE

REFLECTIONS

*“GETTING STARTED ON
THE RIGHT PATH” —
COL. WALTER J. REUTER*

In 1949, when the Air Force Dental Division was created with Brigadier General George Kennebeck as chief, I was assigned as the only dentist on staff with him. We had our work cut out for us. A lot of projects that we initiated lasted for years, and some may still be in effect, such as the Senior Dental Program, which we initiated to deal with the shortage of dentists.

We wanted dental facilities that provided more patient privacy, that is one patient per operatory, rather than the huge open dental clinics that the Army utilized up to that time. So it was necessary to provide input at the earliest possible time as Congress was funding the building of new facilities. We also wanted to provide educational opportunities to the dental officers that would help towards retaining dentists as well as provide opportunities for the young dentists to expand their skills while on active duty, and not just do amalgams. We worked hard to get Air Force dental officers in residency programs at civilian institutions as well as Army and Navy facilities. I could go on and on about the programs initiated in those early years that had good lasting effects on the Air Force Dental Corps. One reason so much was accomplished in such a short time was the exceptional leadership General Kennebeck exerted. He was a pleasure to work with and I think as an officer was the finest I ever worked with. He was the right man for the job at the right time, and he got the Dental Corps started on the right path.

The National Security Act of 1947 allowed for the formation of the United States Air Force; however, it would be two years before the Air Force would provide its own medical and dental support. General Hoyt S. Vandenberg, Air Force Chief of Staff, signed Order No. 35 on June 8, 1949, establishing the AF Medical Service effective July 1, 1949. The Dental Service was one of the six subordinate components, headed by the Dental Division in the Office of the Surgeon General. Brig. Gen. George R. Kennebeck and Lt. Col. Walter J. Reuter, assisted by one Medical Service Corps Officer, were the original dental staff of the division.

On July 1, 1949, 175 dentists, regular officers, and 249 reserve dental officers on active duty transferred from the Army. But there was a severe shortage of dental officers and enlisted men at the inception of the USAF Dental Service. Over 18,000 Army dentists served in WWII, and by late 1946, over 14,000 had separated creating a shortage of dentists that would persist for years to come. Even though the Army had undergone massive demobilization shortly after the war, there still remained millions of men in uniform. At the start of the Korean War in 1950, the dental shortage became acute.

“A standing rule was that the Army did not have to release anyone they did not want to, and the Air Force did not have to accept anyone they did not want. The transition went very smoothly.”

*Col. Walter J. Reuter,
USAF Dental Officer on
the Transfer Board.*



Col. Walter J. Reuter

IN APPRECIATION OF WALTER J. REUTER

Fortunate to be blessed with good health and long life, Col. Reuter's personal communication, as well as documents and photographs retained from the early years of the USAF Dental Corps, have been an invaluable asset to the writing of this commemorative history. His orderly and administrative skills resurfaced with his help on this project. Col. Reuter will always remain one of the most influential persons in the history of Air Force Dentistry.

USAF DENTAL SERVICE SEAL



All Air Force medical insignia have the central design of a staff with one snake coiled around, the same symbol the ancient Greeks used for the healing arts. It represented the staff of Asklepios, a mythological Greek physician.

THE EARLY YEARS

EARLY LEADERS

While George R. Kennebeck began piloting the Dental Division in 1949, he was soon joined by some very capable individuals. Walter R. Reuter was eventually joined by John K. Sitzman in 1950, Walter H. Bird in 1951, and Kenneth R. Elwell in 1952. Many of the programs these men initiated were visionary, producing long term positive fruits for the Dental Service. Input as to the necessary numbers of dentists, facilities, and equipment to support the Air Force mission, as well as recruitment objectives such as the Senior Dental Program, had to be coordinated with Congress.

Col. Reuter was responsible for the initial procurement allotments for specialty training of Air Force dental officers at various military and civilian teaching centers. Many of the graduates of these programs would soon be instrumental in helping establish the highly acclaimed dental residency training programs at several Air Force installations, notably, Wilford Hall. Col. Reuter also established guidelines for the training of assistants and laboratory technicians, as well as advocating that the Air Force train its own personnel for administering annual prophylaxis treatments. Colonel Elwell established the Air Force Preventive Dentistry Program, while Col. Walter H. Bird coordinated the Senior Dental Administration Management Course.

SENIOR DENTAL PROGRAM

To alleviate the shortage of dentists in 1949, the Senior Dental Student Program was initiated, facilitating officer procurement. Those students entering the program were commissioned on active duty as second lieutenants during their final year of dental education and entered the Air Force as first lieutenants upon graduation. It was a visionary program that would serve the Dental Service well for decades to come. Seventy-eight dental officers were commissioned by way of the Air Force Reserve (Medical Service Corps) via this program during fiscal year 1949-50. Their service obligation was two years. In 1955, the obligation time was extended to three years. One of the most respected Dental Service leaders, Maj. Gen. Arthur J. Sachsel, entered the Senior Dental Program in 1949 and served in Washington during the 1980s.

AIR FORCE MANUAL 160-13

In late 1950, Colonel John K. Sitzman began working on development of a Dental Air Force Manual to replace the existing guidelines set forth in Army manual AR 40-15. In July of 1951, the Dental Administrative and Technical Procedures Manual (AFM 160-13) was published. It demanded extensive changes throughout the Dental Service including the initiation of AF Form 309 in all USAF dental folders. The new DD Form 477, the Dental Service Report, also began to be utilized, which greatly improved the reporting media for dental activities. AFM-160-13 outlines instructions as to the following:

- Mission and Function of the Dental Section
- Dental Administration
- Technical Provisions
- Reports and Records

AF FORM 309 THE DENTAL HEALTH RECORD

In 1948, the Secretary of Defense indicated a desire for all federal services to use the same medical and dental forms. Dr. Reuter took the early initiative to format such a form, which the Air Force began to use in 1951, AF Form 309 (see page 57). By the end of 1952, 95 percent of Air Force people had the form completed in their dental record. A few modifications have been incorporated to accommodate some desires of the Navy and Army, but the present SF Form 603 used today by all the military services is basically the same as its original precursor fifty years ago.

PROMOTION, DENTAL AUTONOMY, AND THE AMALGAM MILL

The morale of the dental officers at the close of the second World War was low, resulting in a mass exodus from active duty. Over 95 percent of the dental personnel had separated from the Army by the end of 1946. Three primary reasons were cited as detrimental to morale:

- unfavorable promotion status;
- a pervasive feeling that the dental corps was dominated by the medical component; and
- many officers had served in “amalgam mills.”

The issues were still a concern when the AF Dental Corps was established years later in 1949.

The “promotion situation” would improve. In 1945, less than 15 percent of the dental officers were above the rank of captain as compared to physicians, of whom 30 percent were majors or higher. In 1949, 40 percent of the dental officers in the Air Force were above the rank of captain. Legislation in 1952 also allowed for dentists to be commissioned as captains.

The “domination” issue arose from the administrative policy that dental commanders were subordinate to medical commanders at each base, and received their promotion reports from them. Most medical commanders allowed their dental groups to function without too much interference from the hospital, however, the unfortunate reality was that far too many situations existed where the medical commander undermined

the authority of the dental commander in supervising his own personnel. In 1944, the American Dental Association (ADA) introduced legislation that would give “autonomy” to the Dental Section, not necessarily total independence, but more communication and control of dental affairs from the Dental Section of the Surgeon General’s Office (SGO). In 1950, the ADA again tried to help by introducing the following resolution to the Armed Services Committee:

“Whereas dentistry is a distinct and separate profession, supported by its own state and national organizations and no other profession or administrators are qualified to direct, supervise, or evaluate dental services, including public health dental programs, except a dentist.”

In 1951, Air Force correspondence from the Dental Division of SGO to the Resource Analysis Division concerning management improvement stated, “management and control of dental matters by the dental profession is imperative, and compromised under the existing outmoded administrative structure.”

The Air Force Organization Act of 1951 credited “the Dental Service within the USAF as a separate service” and that “its activities prescribe that professional control, supervision, and staff representation be through dental personnel.”

In the field, the dental supervisor would be responsible to the commanding officer of the air establishment including the medical components, but would handle all operations pertaining to dentistry and the personnel assigned to it.

In essence, the Base Dental Surgeon was supportive of the Hospital Commander, but his chain of authority came from the Dental Division at SGO.

Air Force Dental leadership felt educational opportunities would best deal with the grievance of the “amalgam mill,” also referred to as the “lead line.” Progress obviously takes time, and the officer fresh out of school usually does do a lot of operative dentistry, but the opportunity for further education as a general rule within the Air Force Dental Service has been encouraged. Additionally, in time, as more specialists

“Whereas dentistry is a distinct and separate profession, supported by its own state and national organizations and no other profession or administrators are qualified to direct, supervise, or evaluate dental services, including public health dental programs, except a dentist.”

became available, many clinics provided in house training and rotations to the general dentist allowing each dentist to treat a wider range of patients. The evidence indicates some improvement early on. In 1953, the Inspector General reported to the Command Surgeon’s Conference that “high quality professional service” was being provided, and that “outmoded production line dentistry had been eliminated.”

ADMINISTRATION AND MANAGEMENT

1949-1996

During WWI the Dental Section was under the Personnel Division of the Office of the Surgeon General, and it was not until WWII that the Army Dental Corps attained more autonomy.

In 1949, the Dental Division at USAF HQ, SGO consisted of two branches: Research & Statistics and Plans & Training. That changed in 1950 when the Korean War necessitated a rapid expansion in the number of Air Force dental personnel. In 1951, the renamed Dental Service consisted of four divisions: Professional; Plans, Policy, and Training; Dental Facilities, Equipment, and Supplies; and Preventive Dentistry and Research.

In order to better represent the enlisted personnel at the highest level, the position of Dental Enlisted Affairs was created in 1980 within the HQ of the AF Dental Service in Washington.

A three week Officers' Basic Military Training Medical Course was established in 1951, at Gunter AFB, AL, for dental officers coming on extended active duty. Basic military skills and officership, including career development was introduced. An overview of dental services, health records, and patient administration was also provided. During the 1980s, Medical Readiness Training was added to the curriculum, exposing the dental officer to life saving techniques during field and combat operations. The course relocated to Sheppard AFB from 1966 to 1991, and is now back in Alabama.

A Base Dental Surgeons' Course began in 1953, as well as a Dental Staff Officer Course in 1966, both

The four divisions within the Dental Service in the early 1950s were:

- 1. Professional*
 - 2. Plans, Policy, and Training*
 - 3. Dental Facilities, Equipment, and Supplies*
 - 4. Preventive Dentistry and Research*
-

to improve the administrative aspects of the Dental Service. In 1996, a Dental Squadron Administrative Workshop was initiated to develop officers and NCOs for flight leadership positions.

Current Organization and Professional Development

The Assistant Surgeon General for Dental Services for the Air Force is assisted by a staff of four dental officers. They help operate the Dental Service on the principle of "management by objectives." All plans, policies, and programs are established as objectives in order to accomplish the dental support of the Air Force mission. Within the organizational framework, Command Dental Surgeons attached to each air command serve as an operational link to the base dental surgeons on the working level, who are responsible for the implementation of programs. At the base level, the dental component is also part of the medical team with the goal of total patient care. In this sense, the base level dental commander has a vertical chain of authority from Washington, as well as a horizontal chain in support of the medical mission.

The general practitioner provides the bulk of dental care, supported by a foundation of experienced dental staff officers as well as specialists in the various fields of the profession.

Specialty care is readily available through a military consultant program or referral to a regional hospital. Since its inception, the Dental Service has sought to provide care on an equitable basis worldwide as the best means to support the versatile needs of the Air Force. In essence, Air Force personnel are to have access to dental care regardless of where they are on duty. The Air Force has done well in honoring this goal throughout its 50 year history.

Both officer and enlisted dental personnel are provided opportunities for professional and military service development. These include in-house training programs, continuing education courses, professional military coursework, and post-graduate residency programs at civilian and military installations.

Career dental officers are strongly encouraged to participate in the same military professional coursework as their fellow pilots and line officers. Most Air Force dentists in supervisory positions have completed Air Command and Staff College, as well as the challenging Air War College, the same studies required of other Air Force colleagues as higher rank is attained. This helps to better appreciate the overall Air Force mission.

USAF DENTAL OFFICER INSIGNIA



In 1955, the USAF Medical Service authorized badges to be worn by its different divisions. The Dental Badge, originally consisted of a shield with a superimposed "D," and in the 1960s a star was added on top for dental graduates of long term specialty training. The scroll was added later for those who were board certified, as well as dentists who had served in Air Force administrative positions for ten years. Today, any dental officer with 15 years of uniformed service may wear the badge and scroll.

LEADERSHIP



Maj. Gen. George R. Kennebeck
1949-1952



Maj. Gen. Marvin E. Kennebeck
1952-1958



Maj. Gen. James S. Cathroe
1958-1960

THE GENERALS

Leadership is a key component in any organization, and in large measure, the Dental Service has had its share of good leaders, including their staff officers. Maj. Gen. George Kennebeck was gifted in organization and management skills which were vitally necessary during the turbulent first years of getting the Dental Service started, compounded with the onset of the Korean War in 1950. He was credited with promoting a high state of morale among the Air Force dental personnel.

Before retiring from office, General Kennebeck received a list of potential candidates to replace him, one of which was his younger brother of eight years, Col. Marvin Kennebeck. General George Kennebeck retired in June 1952, prior to the board convening in July. He stated, "I don't want anyone to ever think I gave it to my brother. If he gets the position, it will be

because of his own merit." In the fall of 1952, he was pleased indeed to hear that his brother had been selected to replace him.

Maj. Gen. Marvin Kennebeck is remembered as promoting preventive dentistry, exemplified by his pioneering the use of fluoridated water on Air Force bases, as well as encouraging each base in initiating a Preventive Dentistry Program. The numbers of dentists involved in oral research greatly expanded during his tenure. His office provided input during a period in which many dental facilities were constructed. Perhaps he should best be remembered for encouraging increased professional training of Air Force dental officers. He expanded postgraduate training courses by over 100 percent and set a goal of having 30 percent of dental officers as specialists. Shortly before his retirement, residency programs at Lackland AFB had indeed been started. General Marvin Kennebeck also served as vice-president of the American Den-

tal Association in 1955.

During the late 1950s and early 1960s, Generals Cathroe, Harlan, and Dunn placed much emphasis encouraging Air Force dental officers to seek postgraduate training. Consequently, the residency programs at Lackland AFB continued to expand. The word to describe Maj. Gen. Maurice Harlan may be "education," as he had been head of the dental teaching facilities at Gunter AFB, Alabama, and therefore had an inherent interest in promoting both officer and enlisted educational programs.

Brig. Gen. Benjamin Dunn stressed quality dentistry, and had "a passion for nurturing postgraduate dental training." He was also credited with the development of Area Dental Laboratories. General Dunn died of cardiac arrest in 1966. Dunn Dental Clinic at Lackland AFB is named after him.

His successor, Maj. Gen. Lee

Postgraduate education training opportunities for dental officers has remained very important to Dental Service leaders throughout its 50 year history.

LEADERSHIP



Maj. Gen. Maurice C. Harlan
1960-1964



Brig. Gen. Benjamin W. Dunn
1964-1966



Maj. Gen. Lee M. Lightner
1966-1970

Lightner, promoted the use of the panograph on every inductee into the Air Force, a practice which the civilian sector now embraces on first time visits by patients. He also encouraged the Air Force to utilize computers to assist front desk personnel in maintaining patient records and recall status.

General Lightner's staff officers spent many hours meticulously writing criteria for dental clinics and oral health standards. In essence, the necessary manpower, treatment rooms and facilities required to provide adequate dental support of the Air Force mission. Their efforts in justifying the importance of the dental mission were worthwhile, especially during the 1970s when Maj. Gen. Roger Hombs and Maj. Gen. Robert Thompson had to "fight downsizing."

Passage of continuation pay for dental officers was a boon for the Dental Service during the early 1970s, as was the formation of the Dental Investigation Service in 1976.

General Thompson was the only Air Force dentist to have had a hospital named after him, at Carswell AFB, Texas. When Carswell closed in 1995, the Air Force honored General Thompson by naming the dental clinic at Dyess AFB, Texas, on his behalf. He was a native Texan.

Maj. Gen. Stanley Kolodny presided during the Reagan buildup and perhaps is most remembered for the posturing of the Dental Service in medical readiness, emphasizing medical emergency training of dental officers. His efforts reinforced the fact that dentists are team players in the Air Force mission and should not be overlooked as capable of making significant contributions in a mass casualty or wartime scenario.

Maj. Gen. Arthur Sachsel, gifted with strong personal communication skills, had a passion for promoting the "value" of the dental officer to the Air Force mission. He was also a strong advocate of readiness training as well as postgraduate training evidenced by the formation of the Advanced Dentistry Program

for mid-career general dentists. The TRICARE Family Member Dental Plan, which had been sought after for years by all branches of the military, began in 1987 shortly after his retirement. General Sachsel expressed, "being a Chief of the Dental Corps is a very humbling experience given the fact that all of us have great expectations and visions, but those are tempered with the unfortunate reality that within the political setting of Washington much energy and time is spent defending all the gains and accomplishments from previous administrations."

Maj. Gen. Donald Butz would indeed live that challenge as the Dental Service entered in the 1990s. Also a strong advocate of dental education with an favorable eye on his general dentists, he encouraged them to keep pace with the rapid changes in knowledge and technology facing the profession; he took pride in stating "the dental corps had done well in that regard." However, he was also faced with a severe challenge of downsizing, as well as competition to retain the two-star

Many programs that came to fruition under one staff in Washington are the result of hard fought struggles and foresight by previous administrations.

LEADERSHIP



Maj. Gen. Roger Hombs
1970-1975



Maj. Gen. Robert L. Thompson, Jr.
1975-1979



Maj. Gen. Stanley C. Kolodny
1979-1982

position that the Chief of the Dental Service had traditionally worn. This had been a struggle for many years previously.

“Consolidation” of the Department of Defense assets and promoting tri-Service joint programs has been a big concern in the 1990s. Brig. Gen. Jerry Gardner and his staff helped secure the School of Healthcare Sciences at Sheppard AFB, Texas, as the educational and training facility of both dental assistants and laboratory technicians for all Armed Forces enlisted personnel. The Navy had hoped for San Diego to be their training facility, while the Army preferred Ft. Sam Houston.

The strong economy of the 1990s made private practice more attractive to graduates of dental schools who often were heavily in debt. All of the military services began to lose many young dentists after their first term. In order to meet the challenge of recruiting and retaining dentists, Brig. Gen. Theodore Almquist’s staff worked with sister branches of the military in securing congressional passage of the “additional” and “special pay pack-

ages” such as the \$30,000 accession or sign-on bonus.

During the military cutbacks of the 1990s, it was difficult, but important, for Armed Forces dental leadership to continually strive for retaining as many dentists in uniform as necessary to support the military mission. There was a strong push in Washington to outsource as much dental care to civilian dentists as possible; however, the concern was a possible compromise of mission readiness. Military dentists who are familiar with the complexities of tracking and maintaining the oral health needs of its mobile personnel know that it requires dentists in uniform treating patients in uniform to do the job efficiently. General Almquist successfully asserted that the USAF Medical Service commitment to “blue suit primary care for blue suiters” applied to dental care as well as medical care.

THE RANK OF THE ASSISTANT SURGEON GENERAL FOR DENTAL SERVICES

In October, 1960, the Journal of the American Dental Association reported that Thomas Powers, chairman of the Association’s Council on Federal Dental Services, protested “the unfavorable position of the Air Force Dental Service as compared with those of the other branches of the Armed Services regarding the rank of Major General,” and urged that legislation be submitted to insure parity.

In 1963, Bill H.R.1700 was introduced to Congress to increase the efficiency of Air Force dental care. Section 8082 of the bill outlined the specific responsibilities of the Chief of Dental Service and stated, “an appointee who holds a lower grade shall be appointed in the regular grade of major general.” The bill was referred to the Committee on Armed Services,

Diligent efforts and documentation in justifying the importance of the dental contribution to the mission has been emphasized by dental leadership.

LEADERSHIP



Maj. Gen. Arthur J. Sachsel
1982-1987



Maj. Gen. Donald J. Butz
1987-1993



Brig. Gen. Jerry D. Gardner
1993-1995

which interpreted the bill as the Air Force Dental Service striving to be a separate organization. Their response was that the Dental Service in fact was functioning well in their existing status within the Medical Service and ratifying the bill would “create a separate staff segment and additional administrative overhead.” Additionally the committee stated that the present Assistant to the Surgeon General for Dental Service was in fact a Major General. In essence, the Committee felt no changes were necessary in the existing format whereby the Air Force Dental Service was serving well within the organizational structure of the Medical Services. Passage of the bill failed, as well as acquisition of the statutory position of Major General for the Assistant Surgeon General for Dental Services.

In subsequent decades, the question of the Air Force securing a Congressional statutory position of Major General for the Dental Service continued to resurface. Congressional legislation during

the 1970s secured statutory two star positions for both the Army and Navy. The USAF Dental Service throughout the years diligently tried to retain its tradition of having a Major General; however, the unfortunate reality is that during a period of downsizing, as during the 1990s, the competition for a reduced number of general slots adversely affected the Air Force Dental Service. General Butz was informed his successor would not be eligible for a two star position.

Following General Almquist’s retirement in 1998, a general officer was not chosen to follow him. Col. Laurie N. Matiasevich, Jr. filled the statutory position of Director of Dental Services. During his tenure, diligent efforts by several of the retired AF dental leaders, as well as the ADA helped secure congressional legislation within the National Defense Authorization Act of 1999. It now requires at least a brigadier general to serve as the Assistant Surgeon General for Dental Services.



Brig. Gen. Theodore C. Almquist
1995-1998



Col. Laurie N. Matiasevich, Jr.,
1998-

The unfortunate reality is that a lot of time and effort is utilized to prevent the loss of valuable things gained from previous administrations.

LEADERSHIP



CMSgt. Charles P. Kazmer
1980-1984

THE CHIEFS

The dental auxillary are the backbone of the Dental Service of the Air Force. The scope of their duties include direct chair-side assisting, fabrication of dental appliances, scheduling of patients, handling supplies, equipment maintenance, records upkeep, and the overall daily operation of dental clinics. The Dental Service could not operate without them.

Over 18,000 Army enlisted personnel served in the Dental Service during WWII. By the war's end, the following changes were needed:

*More assistants assigned to dentists, thereby increasing the output of a dentist upwards of 30 percent.

*Permanent assignment of auxillary personnel to the dental service. During the war, dental enlisted personnel were not permanently as-



CMSgt. Michael T. Goodrich
1984-1988

signed, and were often transferred to other duties, thereby decreasing the efficiency in operation of dental clinics. Generally speaking, dental officers felt they should have had more control over their own people.

*Increased promotion opportunity and evaluation by dental commanders, not medical supervisors.



CMSgt. Stuart J. Weaver
1988-1991

In many respects, these same challenges remain today and will persist into the twenty-first century.

All organizations within the Air Force voice concerns over manning, and Dental Corps supervisors have most assuredly fought in this arena. USAF leaders have to be reminded not to overlook the importance of enlisted dental specialists to the mission.. Enlisted personnel are now evaluated for promotion by dental supervisors, and the Air Force today has an established "guarantee of promotion opportunity," whereby each person eligible for promotion only competes with others of the same AFSC.

There had always existed teamwork within individual dental clinics; however, in order to increase the enlisted perspective at the air staff level, the position of Chief of Dental Enlisted Affairs within the Dental Service headquarters in Washington was created in 1980, CMSgt. Charles P. Kazmer being the first.

LEADERSHIP



CMSgt. Michael L. Roder
1991-1993



CMSgt. Dale P. Herman
1993-1996



CMSgt. Walter C. Tieck, Jr.
1996-1998

The Chiefs coordinate enlisted training requirements, provide guidelines for the proper mix of staff to dentist ratios, and give direction on ways to improve support staff functions at the clinic level.



CMSgt. Arthur G. Kennedy
1998-

REFLECTIONS

“WE ARE NOT AN ENTITY TO OURSELVES” — CMSGT. WALTER C. TIECK, JR.

The Chiefs in this position also believe one of their missions, so to speak, is to communicate that we in the dental enlisted component are not an “entity to ourselves.” It is important to remind Dental Corps people that we are a part of the Medical component as well as the Air Force. We do not just do specifically what we are trained to do within the dental environment. Only when we see ourselves in the bigger picture, and actively participate in the hospital and base setting, do we broaden ourselves and enhance our careers. When we do that we better support the Air Force Mission in terms of readiness as well as patient care. That idea is very hard for a first timer to grasp, as it was for me, and I suspect most of us. Understandably, we are anxious to do what we had just completed our training for, but it is important for supervisors to help their personnel see the bigger picture. If we can do this, I believe people will have a healthier identity with the uniform and in turn will see the military in a more professional sense, and it will be more inviting as a career. That also places responsibility on this office as well as clinical supervisors, even the Air Force as a whole, to treat its personnel as professionals. If we as Air Force leaders expect our people to be trained and hold themselves professionally, then we should strive to provide good facilities, pay, and benefits just as occurs in other avenues of the American workforce. If we do that, I think we can expect to retain more people when it comes to reenlistment.

ENLISTED TRAINING

Air Force dental auxiliaries are utilized in three basic areas: Chair-side Dental Assisting (Dental Technician), Preventive Dentistry (oral prophylaxis and hygiene instruction), and Dental Laboratory Technology.

In 1949, the Air Force proposed the establishment of a school for training its own dental technicians. In the meantime, the sister branches of the service would assist in training Air Force dental assistants. In July 1950, plans were developed and implemented to have the Navy train 350 enlisted personnel in increments of 50 a month per twelve week class at the U.S. Navy Training Center, Great Lakes, Illinois. A shortage of at least 1300 dental technicians was evident in 1950 and would persist, it was feared, due to the eruption of the Korean War in June 1950, which had necessitated an expansion

“Commanders and manpower boards should be impressed with the fact that the maximum output of the dental officer can be accomplished only when a sufficient number of trained technicians is provided each dental officer.”

USAF Medical Services Digest, Dec, 1950.

sion of all military services. The first class of 43 graduated in October 1950. It was extended to 90 per class in 1951.

Those personnel requiring specialized training in laboratory procedures were sent to several Army and Navy installations, including the Medical Field Service School, Ft. Sam Houston, Texas, the Naval Dental Technicians School, at Bainbridge, Maryland, and the Naval Dental School, Bethesda, Maryland. These measures

were insufficient, however, and in 1951, the Air Force contracted with the Institute of Applied Arts and Sciences in Brooklyn, New York, to provide 180 dental laboratory graduates from its thirty-six week course.

On June 9, 1952, at Gunter AFB, Alabama, the Air Force began to train its own dental auxiliaries. To give a perspective of the manning shortage faced by the Dental Service, that same month, statistically, there were 2,251 dental airmen while requirements called for



Dental Laboratory Technician Training at Sheppard AFB, Texas

ENLISTED TRAINING



On-the-job training in radiology at Lackland AFB, Texas

3,892.

In 1967, the training of dental personnel was transferred from the Medical Service School at Gunter AFB to the newly-built facility at Sheppard AFB, Texas. It was renamed the School of Health Care Sciences (SHCS) in 1971. That same year, the USAF Dental Services was the first of the Armed Forces to have both its dental laboratory and dental assisting training programs approved by the American Dental Association's Council on Dental Education.

During the 1970s, the Air Force did have an intensive teaching program for "expanded duty dental assistants" trained to do reversible dental procedures such as placement of fillings, rubber dam application, cementation of crowns, and so forth; however, that has since been discontinued.

By the time of its silver anniversary in 1974, the Air Force had graduated close to 10,000 enlisted personnel from its train-

ing programs that had begun in 1952.

The training and career progression of dental personnel is a combination of formal instruction at Sheppard's SHCS as well as on-the-job training in Air Force dental facilities. The actual training routes available to individuals have changed some over the years, but remain structured to a "three level" tier process of achievement. The first step is called the "three level," while the "five level" is the second plateau, followed by the "seven level," or third level of achievement. There is also a "nine level" designated for senior non-commissioned officers.

Completion of basic training at Lackland AFB is followed by graduation from a nine-week training course at Sheppard AFB. All education coursework at Sheppard is accredited by the American Dental Association. Graduates are referred to as dental technicians and ready to chairside assist in dental facilities. At this point, students have now

"The Air Force Dental Service was first among the Armed Services to have both its dental laboratory and dental assisting training programs approved by the Council on Dental Education of the American Dental Association."

USAF Medical Services Digest, Dec, 1971.



Red Cross Training at Dyess AFB, Texas. There are currently about 230 volunteer Red Cross trainees within AF clinics worldwide.

ENLISTED TRAINING

USAF DENTAL ENLISTED INSIGNIA

completed their “three level” training.

While at their first clinic assignments, dental airmen are enrolled in a Career Development Course where they are progressively tested in dental aptitude, knowledge, skills, attitude, and professionalism while performing their assigned duties. After about eighteen months of on-the-job training, the dental airman has attained the second plateau of his training referred to as the “five level.”

Close to the end of three years, the opportunity to cross-train into other jobs within the Air Force is offered. Most dental enlisted personnel are senior airmen by this time. At this point, if one elects to stay within the dental field, he or she can chose

*The School of Health
Care Sciences at
Sheppard AFB is
known to many as the
“schoolhouse.”*

to enter dental laboratory training and attend a six month course at Sheppard. On the other hand, those who elect to stay with dental but not in the laboratory arena can apply for the advanced oral hygiene course taught at Wilford Hall, graduating as “preventive dentistry technicians.” For those electing to stay within the dental field, at the four year point of their career they are usually SRA or SSgt.

Within a few years, and prior to promotion to TSgt., non-



BASIC DENTAL BADGE

*(Dental Apprentice)
Worn by all enlisted dental
personnel who have completed
“3 level” training.*



SENIOR DENTAL BADGE

*(Dental Craftsman)
Worn by non-commissioned dental officers
who have completed “7 level” training.*



MASTER DENTAL BADGE

*(Senior Dental NCO's)
Worn by senior ranking NCO's who have
completed “9 level” training.*

ENLISTED TRAINING



Dental assistant training, Sheppard AFB, Texas.

commissioned dental people position themselves for career progression by being selected to attend the seven-level dental craftsman course at Sheppard. The training received there helps in preparation for middle management positions within Air Force dental clinics. Examples of dental NCO seven-level positions include front desk managers, equipment and supply managers, data and records coordinators, preventive dentistry instructors, and so forth. Both laboratory technicians and chairside technicians are encouraged to develop management skills as this is where higher promotion opportunities exist. Most senior NCO managers within dental clinics are “nine levels,” usually SMSgt. The few individuals who attain the rank of CMSgt. generally serve at larger facilities.

The School of Health Care Sciences at Sheppard AFB, referred to as “the schoolhouse,” has provided coursework for many years. In addition to dental assistant and dental lab tech coursework, preventive dentistry training (prophy tech) was at Sheppard for many years, as well as orientation courses for USAF commissioned health care officers. Col. Harold H. Biddle served as commander of the school in the early 1980s, the first time in the school’s history a dental officer was selected to do so.

During the downsizing of the 1990s, the Armed Forces were tasked with consolidating between the sister services as many training programs as possible. Today, the staff of the Interservice Training Review Organization (ITRO) at Sheppard annually graduates about

1300 dental technicians and 150 dental laboratory technicians. The Air Force was honored when Sheppard’s SCHS was selected to train dental enlisted personnel for all the Armed Services. This, in reality, was a result of many good years of teaching curriculum, instructors, and facilities at Sheppard AFB.

As of 1997, technician training for all enlisted dental personnel of the Army, Navy, and Air Force is conducted at Sheppard AFB, Texas.

OFFICER TRAINING

A NEED FOR MORE SPECIALISTS

The opportunity for advanced training within the USAF Dental Service has always been available and strongly encouraged by its leadership. Early on, several avenues existed such as the sixteen-week Advanced Dentistry Course at the Army Medical Service Graduate School in Washington DC, attended by 21 USAF dental officers from 1949 to 1951. During that same time interval, three dental officers received advanced training in oral surgery, one in bacteriology, and seven in prosthodontia. The length of training time for these residencies varied from nine months to two years. Five of the residents occupied positions as Professors of Military Science and Tactics as their primary duty at their respective teaching institutions. Additionally, nine reserve dental officers completed one year internships at various Army General Hospitals.

In 1954, General Marvin E. Kennebeck set a goal to have 30 percent of the dental officers as trained specialists.

The residencies and internships listed above remained in place while plans were being set forth to expand training in all phases of clinical dentistry. Col. Walter R. Rueter, in 1951, coordinated with civilian institutions as well as Army and Navy teaching hospitals for the establishment of postgraduate course allotments for Air Force

dentists. Fifteen spaces were initially allocated for the Air Force regarding dental subspecialties: nine in prosthodontics, two in oral surgery, two in periodontics, one in orthodontics, and one in oral research. Twelve short courses (less than three month's training) were to be established: four in prosthodontia, five in periodontia, one in oral surgery, and two in oral research. The numbers of these allocations would remain in place until the mid-1950s, at which time the Air Force would begin training many of its own dental specialists.

From early on, leadership within the Dental Service had laid a solid foundation for higher dental education, and the fruits of these efforts would soon be realized with some of the most respected dental specialty teaching programs offered anywhere in the world.

In 1954, Maj. Gen. Marvin Kennebeck set a goal to have 30 percent of its officers be specialists, with the approximate ratio: 10 percent in oral surgery, 10 percent in prosthodontics, 9 percent in periodontics, and 1 percent in orthodontics and oral pathology. All of the military services needed more trained specialists, and since they were unable to recruit the necessary numbers, it was assumed that establishing more training programs within military hospitals would help the situation. Since none existed for the Air Force, this meant taking initial steps in that direction.

In March 1954, the American Dental Association's Council on Dental Education held a workshop concerning the educational

requirements of dental specialty boards. Col. John K. Sitzman represented the USAF Dental Services Division in requesting that "properly staffed and equipped military dental clinics be approved as teaching centers," whereby American board-certified military specialists "would be in a position to disseminate knowledge to great numbers of young graduates rotat-

"Military dental clinics as teaching centers would be in a position to disseminate knowledge to great numbers of young graduates rotating through the military services."

ing through the military services."

At that time, there were a little over 200 USAF dental specialists; however, it was estimated that another 370 were needed.

Implementation of internships and residencies began at the Lackland Hospital Dental Clinic in September 1956. They were approved for accreditation by the American Dental Association on June 5, 1958. Simultaneously, Air Force dentists continued filling residencies at civilian schools and military hospitals.

The Dental Director at Lackland was Col. Wilbert A. Schroeder and his assistant, Maj. Henry L. Copeland, was the Education Director. The directors of the specific residencies included Kenneth D. Rudd in prosthodontics, Jules D. Kartman in periodontics, and Richard

WILFORD HALL MEDICAL CENTER

Kelly Field of the Army Air Forces located on the western area of San Antonio witnessed a large growth in facilities construction beginning in 1941 while serving as a training center for aviation cadets. By war's end, the hospital had grown to a 1200-bed complex. In 1946, the Army Air Forces established Kelly Field as their central military training center, and in 1947 named the newly completed facilities immediately adjacent to Kelly as Lackland AFB.

Thousands of recruits required urgent dental care while completing their training at Lackland. During the Korean War, the hospital complex served as a major debarkation point for returning casualties. By the end of the war, Lackland had established itself as a major medical center providing specialty care in support of over a dozen Air Force installations located in the Southwest.

In 1954, Air Force Surgeon General, Maj. Gen. Dan C. Ogle, authorized construction of a new hospital at Lackland with a goal that it would become the center of medical education and research for the Air Force. Lackland Training Center became the "Gateway to the Air Force," serving large numbers of young troops coming on active duty. By the early 1960s, the Lackland institution had established medical and dental residencies in most major specialties within both professions. The Lackland hospital was named Wilford Hall (WHMC) in 1963 in honor of one of the Air Force's distinguished physicians.

MacKown and Dunn dental facilities at Lackland are two of the largest clinics in the Air Force,

OFFICER TRAINING



Wilford Hall is affectionately known as "Big Willy" to many blue suiters. The Medical and Dental facilities at Lackland AFB house the largest postgraduate dental education component within the Department of Defense.

providing care to large numbers of inductees and retirees while also serving as a referral center. USAF dental instructors working in conjunction with the University of Texas Dental School at San Antonio have established a reputation for having some of the most respected postgraduate training programs in the world. The dental training and resi-

dency programs at WHMC established a standard whereby education and quality patient care are now intertwined in accomplishing the mission of the Dental Service.

| WILFORD HALL DENTAL RESIDENCIES | | |
|--------------------------------------|-------------|---------------------------|
| PROGRAM | ESTABLISHED | GRADUATES (As of 1999) |
| Periodontics | 1956 | 134 |
| Oral/Maxillofacial Surgery | 1956 | 91 |
| Prosthodontics | 1957 | 75 |
| Dental Rotating Internship | 1959-1972 | 171 |
| Dental Laboratory Officer Course | 1959-1978 | 21 |
| General Dentistry | 1967 | 140 |
| Endodontics | 1970 | 54 |
| Maxillofacial Prosthetics Fellowship | 1984 | 12 |
| Hospital Dentistry Fellowship | 1985 | 11 |
| Orthodontics | 1997 | 4 |

OFFICER TRAINING

MACKOWN AND DUNN DENTAL CLINICS

The educational staff at Wilford Hall by the early 1960s had grown to over a dozen. Instructing the oral surgery, periodontics, and prosthodontics involved the bulk of their efforts, but additionally, for several years, they had already directed a number of short term postgraduate training courses in all disciplines of dentistry which ranged in duration from two to eighteen weeks. A rotating Dental Internship Program was begun in 1957, the early precursor of today's comprehensive General Dentistry Residencies.

Today's mission of the dental staff at WHMC has not changed much since the early days. It still involves maintaining the oral health of all military personnel to ensure wartime readiness, providing advanced education through residency and fellowship programs including short term coursework, and providing training of selected enlisted personnel in specific coursework such as the Advanced Oral Hygiene Course currently taught at Dunn Dental Clinic.

Today most other advanced training of enlisted dental personnel is done at Sheppard AFB, Texas. Patient care remains the primary mission, while providing 85 percent percent of the postgraduate dental training offered by the Air Force.

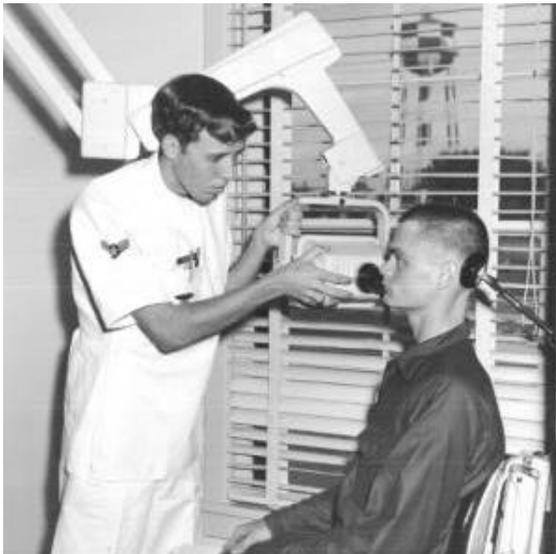
The hospital-based dental components in the main medical facility house the Oral and Maxillofacial Surgery Residencies as well as the Hospital Dentistry section, which oversees a fellowship program within its section.

MacKown Dental Clinic, which opened in 1965 immediately adjacent to the hospital complex, houses the dental specialty training of prosthodontics, periodontics, and endodontics. This was the first AF facility to be named in honor of one its own dentists, Col. John L. MacKown, a respected oral surgeon and WWII veteran who had died the year before while still on active duty. At the time it was the largest dental facility in the world, with 52 treatment rooms and a large dental lab serv-

ing as a world-wide consultation and referral center for complex dental treatment.

Within the prosthodontic section, a Maxillofacial Prosthetic Fellowship was established in 1984 utilizing the skills and materials within the dental lab to help in the fabrication of cleft palate obturators, as well as artificial ears, eyes, and so forth for medical patients.

The tens of thousands of inductees that enter through Lackland receive their dental processing during basic training, and those with significant oral disease are further evaluated. Recruits can be placed on a dental-hold status if immediate needs require treatment prior to being sent to their first assignment. Much of the work is accomplished at Dunn Dental Clinic, which opened in 1980, and is now the largest of all AF dental facilities. It was dedicated on behalf of Brig. Gen. Benjamin W. Dunn, who died in 1966 while serving as the Assistant to the Surgeon General for Dental Services. He had also served as head of the Prosthodontic department at Lackland in the late 1950s and was noted to have been an esteemed advocate of postgraduate education. The two year General Dentistry Residency is taught at the Dunn facility, as well as an Orthodontic Residency which began in 1997.



All Air Force enlisted personnel receive dental processing at Lackland AFB while completing basic training.

OFFICER TRAINING

GENERAL DENTISTRY

In order to better support the worldwide health mission, it was prudent for the Dental Service to have an increased number of more highly trained general dentists throughout the AF, especially at remote AF installations and smaller bases. Such training not only enhances the quality of patient care, but helps the practitioner to realize his limitations and know when to refer to specialists.

In the late 1950s, short term general dentistry coursework was available at Lackland, as well as a one year Dental Rotating Internship Residency taught from 1957 to 1972. The one year program was designed to improve the diagnostic and clinical skills beyond those provided by dental school, basically, a fifth year level of training. By the late 1960s, Lackland and other AF dental facilities had one year General Practice Residencies (GPR). The AF currently provides one year training programs at nine AF clinics, annually graduating over 40 residents. The AF for years has been competitive in recruiting the top graduates of dental schools.

During the 1980s, all Air Force GPRs were converted to a one year Advanced Education in General Dentistry (AEGD) Residency. Many GPR programs at civilian institutions orient their programs to specific strengths such as hospital training, implantology, or treatment of patients with special needs. The current director of the General Dentistry Programs at WHMC, Col. Steven D. Westbrook, points out, "The AEGD for-

mat encompasses the broader perspective of comprehensive clinical dentistry which better supports the needs of AF dental clientele."

In 1967, the AF initiated the two year General Dental Residency (GDR) Training Program at Lackland AFB under the direction of Ovide R. Leonard. It continues to this day, as well as the two year GDR Program offered at Keesler AFB, Mississippi. The two programs combined currently graduate about sixteen dental officers a year. A strong didactic and research component strengthen an excellent clinical program to produce exceptional general dentists. Numerous articles on the cutting edge of dentistry have been published in nationally esteemed journals by AF GDR graduates. Several nationally recognized dental school professors are former AF GDR graduates. All USAF post-graduate GDR programs are routinely rated as "outstanding" by the American Dental Association Accreditation Council.

GDR students are selected from the Air Force Dental Corps, and their training better equips them to serve at smaller bases and to support special readiness requirements. They also serve within larger clinics where they are often instructors and mentors for younger dentists. Their education also prepares them for academia and managerial positions. The excellence of the training is exemplified by the fact that almost 85 percent percent of GDR graduates are board-certified.

HOSPITAL DENTISTRY

An important link between general dentistry and hospital medicine that has slowly evolved through the years is hospital dentistry. Beginning in 1985, at WHMC, John Warnick and James P. Summit initiated a two year Hospital Dentistry Fellowship for board-certified graduates of comprehensive dentistry programs. All eight of the graduates of the program have passed the fellowship exam of the American Academy of Hospital Dentistry. The national pass rate is about 30 percent.

There are currently eight hospital dentists in the Air Force uniform serving at each of the major regional hospital centers. They are called upon to provide consultation and dental care for patients undergoing major medical care and long term therapy such as cancer treatment. The dental care is helpful in preventing infections and complications. Hospital dentists are also called upon to treat patients in need of care that are otherwise unmanageable in the normal dental environment, such as adult handicapped patients. Col. Steven J. Nevins, current director of the program at WHMC, states, "Hospital dentistry requires much patience and is extremely challenging, but can be very rewarding."

Over 40 percent of Air Force general dentists have had at least one year of advanced training.

OFFICER TRAINING

PROSTHODONTICS

One of the most esteemed post-graduate programs within the dental profession is the Prosthodontic Program at WHMC. Much of the credit is due to a solid foundation laid in the 1950s under the direction of Kenneth D. Rudd.

A two year prosthodontic program began in 1957; however, by 1964 it had evolved into a three year program, a standard the ADA followed many years later. The Air Force also established prosthodontic residencies at Andrews AFB and Wright-Patterson AFB from 1965-1973 with each graduating seven. About 140 prosthodontic graduates have passed through the halls of Wilford Hall. Additionally, approximately 120 prosthodontists received Air Force spon-

sored training in other institutions. One key point is that over 70 percent of AF prosthodontists are board-certified as compared with less than 25 percent of prosthodontists in the civilian sector. Many that have retired from the AF have held prominent teaching positions within dental school faculties throughout the country.

Short-term Postgraduate Prosthodontic Coursework also began in 1957 at WHMC. The courses have ranged from several weeks to several months duration. They are unparalleled from a training perspective.

As of 1999 both the Prosthodontic and Macillofacial Prosthetic Residencies at WHMC were rated as “outstanding” by the ADA Commission on Dental Accreditation.



Col. Kenneth D. Rudd

REFLECTIONS

“ANYWHERE BUT LACKLAND”

COL. KENNETH D. RUDD: FATHER OF AIR FORCE PROSTHODONTICS

After serving with the Army as a dental officer in WWII, I separated, but returned to active duty with the Air Force in 1953. Prior to entering the Air Force, I had completed some prosthetic training and was sent to Gunter AFB, which at that time was the School of Health Care Sciences for the Air Force. While there, I taught dental laboratory technology. For my next assignment they asked where I wanted to be stationed. I said, “anywhere but Lackland,” as that base had a reputation of being a “denture mill” because many of the basic trainees were in need of full mouth extractions. Well, you guessed it, I was sent to Lackland, and stayed there for almost ten years. The Air Force was wise to concentrate the various residencies at one installation thereby allowing a greater sharing of information. We had a lot of support from the “head shed,” and I believe we were very progressive at Lackland as well as for Air Force dentistry as a whole. My perception was that the Air Force did not over focus on production and recognized that training takes time. That philosophy served our program well at Lackland.

FOOTNOTE:

The Prosthodontic Program at Wilford Hall Medical Center as well as the USAF Dental Laboratory System that Col. Rudd helped establish remain second to none. The residency has yielded more Diplomates of the American Board of Prosthodontics than any in the country. One of those graduates, Col. Robert L. Engelmeier, (Ret) had an article published in the July, 1997 issue of *The Journal of the History of Dentistry* titled “A Brief History of Air Force Prosthodontics.” It was well researched and credits Dr. Rudd with being “The Father of Air Force Prosthodontics.” Dr. Rudd’s son, Col. Robert W. Rudd, became an Air Force prosthodontist and served as a Consultant For Dental Laboratories to the USAF Director of Dental Services.

OFFICER TRAINING

MAXILLOFACIAL PROSTHETICS

Air Force Dental Laboratory Management

In the early 1950s the Army and Navy trained Air Force dental laboratory technicians and fabricated oral appliances for USAF personnel. In 1952 the Dental Service began to train its own specialists and by 1956 the Air Force was handling its own laboratory needs. In order to increase quality control of technique sensitive dental castings such as chrome alloy removable dentures, as well as consolidate recourses, the Air Force in the late 1950s established an Area Dental Laboratory System (ADL). These regional labs support satellite bases and are managed by dental officers who have extensive prosthodontic training. Many were graduates of the Dental Laboratory Office Course offered between 1959 and 1978 at Lackland. All ADLs are now managed by board-certified prosthodontists. Their consultant and instructional guidance has generated quality prosthodontic care for Air Force members.



Dental Lab technician fabricating an artificial eye at MacKown Dental Clinic.

During the 1990's, prosthodontists at MacKown Dental Clinic pioneered the use of stereolithography for medical and dental purposes. To date, they are the only hospital facility in the world to have done so.

This subspecialty draws the dental profession closer to our medical colleagues. The gifted individuals who work in this area must have a keen sense of ingenuity, innovation, and research ability. Problems cannot always be approached with conventional thought and means. Col. Rick M. Smith, current director of the program at WHMC points out, "This field is fun, but challenging as it requires revolutionary thought, not slow evolutionary change." It supports patients in compromised situations in many ways. Artificial eyes, ears, and noses for plastic surgeons, feeding devices, speech devices, custom ear plugs, face masks for pilots, and obturators for cleft palates are only a few ways it bridges medicine and dentistry.

The one-year Maxillofacial Prosthetic fellowship program at WHMC began in 1984 under the direction of Thomas L. Huff and has graduated ten. Only prosthodontist may enter such training. The Army has no such program, and two Army prosthodontists have completed the residency at WHMC. Much of the research involves continually striving to develop longer lasting prosthetic materials, but the exciting thing at MacKown Dental Clinic these days is stereolithography. The facility was expanded to support this budding technology that can indeed have a revolutionary enhancement in operating room protocol. (See stereolithography in "Oral Research.")

OFFICER TRAINING

PERIODONTICS

There were only a few dental schools that offered advanced training in periodontics when the Air Force was created in 1949. By the early 1950s, a few periodontists were within the ranks of the Air Force including Timothy J. O’Leary, Sam Hoskins, and Jules D. Kartman. These men established a periodontal residency training program at Lackland in 1957, the first within the armed services. By the mid-1950s, there were still only a half a dozen institutions offering advanced degrees in perio.

The ADA credits the WHMC perio program as the “best” in the country.

The Air Force, as well as the Army and Navy, realized they would need to establish their own training programs to provide adequate availability of specialty care to personnel in uniform. As Col. Hoskins recalls, “There were not a lot of periodontal residencies available during the early 1950s, and I believe the Air Force may have been the first of the Armed Services to initiate one, that being in the ‘56, ‘57 time frame. The Army and Navy soon followed.”

Course work started in 1957, graduating the first class of two students in 1958. At that time, only one year of training was required. The following year, the curriculum expanded to two years, one year of didactic at the University of Texas Dental

School in Houston, (now completed at UT Dental School in San Antonio) and one year of clinical at Lackland. Col. Elmer W. Burnette, one of the early two year students, summarized the workload: “I’m not sure younger dentists know what the word ‘work’ really means.” He also added that for years if people asked where one goes to get the best perio training, the response was, “join the Air Force and get a residency at Lackland.”

In 1963, the periodontal program expanded to three years for three primary reasons:

- ◆ Increased knowledge of IV and conscious sedation.
- ◆ Temporomandibular joint diagnosis and therapy.
- ◆ Increased exposure to implant prosthesis.

Air Force periodontal researchers at Wilford Hall in the 1970s received the first federally funded implant program, the “vitreous carbon study.” It was not until 1994 that the ADA required all periodontal programs to be of three years’ duration, something the AF had been doing for 30 years.

Close to 130 individuals have completed the periodontal residency at WHMC, of which six are female, the first two in 1987. Over 85 percent of the graduates are board-certified compared to a national average of 25 percent.

One graduate of the early 1960s was Roland M. Meffert, current professor of periodontics at the UT Dental School in San Antonio. He served as president of the American Society of Periodontists. In an interview in February 1996, Col. Meffert stated, “Wilford Hall has for many years had the best perio program in the country, and I believe it remains so to this day.” The ADA accreditation team that visited WHMC in November agreed.

ORAL AND MAXILLO-FACIAL SURGERY

In 1959, WHMC graduated its first two residents of the two year oral surgery program under the direction of Richard J. Burch. During the early 1950s, the Dental Corps not only placed residents in established residencies at civilian and military institutions, but also provided short term training classes taught by nationally recognized civilian oral surgeons and consultants such as Wilton W. Cogswell of Colorado Springs, Colorado.

The residency at WHMC expanded to three years in the early 1960s under Alex M. Mohnac, nationally known in his field for his contributions to this specialty of dentistry as well as his wartime exploits. Having graduated oral surgery training during the late 1930s, he soon joined the Army and was stationed in the Philippines when the Americans surrendered to the Japanese in 1942. Surviving the “Bataan Death March,” he served as camp anesthetist during his four years of internment. He was one of the original cadre of Air Force officers in 1949.

Col. Mohnac recalls that the oral surgery program at Lackland was the first to perform dento-alveolar and occlusal corrective surgery in the maxilla. Mandibular sectioning and repositioning had been going on for some time but as he states, “I believe we were some of the first in the field to begin more definitive surgery techniques on the maxilla. They may be common now, but not in the

OFFICER TRAINING



Col. Alex M. Mohmac
"Bataan Death March" survivor.

early sixties."

The WHMC residency program also pioneered osteoradionecrosis treatment. In the early 1980s, Air Force dentist Robert E. Marx at WHMC worked with the Hyperbaric Medicine Division at Brooks AFB, Texas in pioneering osteoradionecrosis treatment. Patients who undergo radiation treatment of the head and neck often develop non-healing bone lesions requiring extensive surgery to remove the necrotic bone tissue. His research showed that breathing 100 percent oxygen at depth

helped limit the extent of the necrosis, often making the necessary surgery less radical, sometimes even unnecessary.

The Vietnam war increased the Air Force's need for oral surgeons. Training capability was expanded in 1966 with a second residency program at David Grant Medical Center at Travis AFB. Col. Elliot Smart was the first program director. The program boasted 100 percent board certification rate of its 45 graduates.

By the early 1990s, the specialty began training four year residents now referred to as Oral and Maxillofacial Surgeons (OMS). During the 1990s, several residents participated in six-year programs attaining an M.D. degree, in addition to their oral surgery training. However, by the year 2000, the program at WHMC will again be four years long.

The OMS residency at WHMC is the largest in the federal services, and close to 90 graduates have thus far completed residencies at Lackland. The Air Force currently has about 50 OMS doctors, of which 95 percent are board-certified.

ENDODONTICS

It is not every day that a program receives a "perfect" rating by the ADA Council of Accreditation. William G. Schindler, program director in 1996, pointed out several reasons for the high accolades. "Residents of the program must complete a heavy didactic and research component at the Endodontic Department of UT Dental School at San Antonio prior to beginning a second year of clinical training at WHMC. The student-to-staff ratio at Lackland is one-to-one, and each resident has a full time assistant. This is in contrast to civilian institutions where the resident often works without an assistant. Compared with other endodontics programs throughout the country, this is an ideal program." Several graduates now hold professorships, such as William A. Walker at UT Dental in San Antonio and Cecil E. Brown at Indiana University School of Dentistry. Denis E. Simon recently served as President of the American Association of Endodontics. Dr. Walker will soon serve on the Board of Directors, while Dr. Schindler will be on the editorial staff for the Journal of Endodontics.

The program began in 1971 under John W. Myers. One of the early directors, Steven E. Senia, after his military retirement contributed to the profession with his development of the "light-speed" root canal handpiece. Several versions are on the market today, but his conceptual design preceeded the others. Within the specialty of endodontics, this was a revolutionary change.

The American Dental Association accreditation site visit to WHMC in November, 1996, rated the residencies as the following:

| | |
|-------------------------------------|-----------------------|
| Endodontic Residency | "the perfect program" |
| Periodontic Residency | "The best" |
| Prosthodontic Residency | "Outstanding" |
| Maxillofacial Prosthetics Residency | "Outstanding" |
| General Dentistry Residency | "Outstanding" |

Footnote: The accreditation visit transpires only once every seven years. The Oral and Maxillofacial Surgery Residency as well as the Orthodontic Residency will have their accreditation visit in 1999.

OFFICER TRAINING

ORTHODONTICS

The Orthodontic Residency Program at WHMC was the first “joint” military dental officer specialty training program, thereby acquiring a notable place in the annals of military dental history. Postgraduate programs within one branch of the Armed Services have accepted dentists from sister services; however, the orthodontic program at WHMC was the first to have staff from different military branches.

For several decades, there were approximately 28 Air Force orthodontists; however, in the 1990s, that number declined to the present level of 21. With the program in place, it may help with the shortage of needed orthodontists. The staff and residents consist of Army and Air Force dentists equally represented. The first class will graduate in 1999.

The Army Dental Corps began the first military orthodontic residency in 1985, and soon had two programs, one at Ft. Meade, Maryland, and the other at Ft. Knox, Kentucky. The number of Army orthodontists increased to about 70 in the early 1990s. Unfortunately, the budget cuts of the 1990s caused both programs to close by 1995. That year, Air Force Col. Marion Messersmith, Special Consultant in Orthodontics to the USAF Surgeon General, sought to establish a joint Army-Air Force residency. His vision quickly came to fruition with approval by the Army, Air Force, and American Dental Association. The program began at WHMC July, 1997, with AF dentist Erik Langsjoen as Chairman.

PEDIATRIC DENTISTRY

In the late 1980s, the first Air Force Special Consultant in Pediatric Dentistry to the Assistant Surgeon General for Dental Services was Elliot R. Schulman. He has since been followed by Jeffrey H. Camm and Nicholas J. Levering. Periodically over the years, officers have been chosen for specialty training in this field to treat the family members of active duty military personnel stationed overseas. In addition, medically compromised children have been treated at our major medical centers. Throughout the years, the Air Force Dental Service has averaged 16 pediatric dentists on clinic staff.

The Department of Pediatric Dentistry was formed at WHMC in 1993 to facilitate the treatment of these special needs patients, as well as support the curriculum of the General Dentistry Residency. In general, however, the vast majority of the dental needs of dependents of the active duty populace are provided by the family member dental insurance plan.

CONSULTANT PROGRAMS

The Air Force Dental Service utilizes three separate Consultant Programs to help its dentists in providing quality dentistry to Air Force personnel.

Civilian National Consultant Program

Civilian Dental Consultants have been utilized since the Air Force Dental Service was first established. The Army had laid the foundation with the efforts of Col. Oscar P. Snyder (eventually Major General and Chief of the Army Dental Corps), who envisioned Military Dentistry could be “the best” in the world.

He initiated the use of well known dental educators to serve as consultants to the Armed Forces. The Air Force pursued the same policy and within a year of its inception, it had its first civilian consultant, Dr. C.S. Foster, appointed in 1950. He had been noted for his long experience with the American Dental Association. He was succeeded in 1952 by Dr. Kermit F. Knudtson, a nationally recognized oral researcher, as well as an early aviation dentistry researcher within

FIRST AIR FORCE MILITARY CONSULTANTS, 1961

| Base | Name | Specialty |
|----------|-----------------------------|----------------|
| Andrews | Maj. Francis J. Samaha | Periodontics |
| Lackland | Col. Alex M. Mohnac | Oral Surgery |
| Lackland | Lt. Col. Sam W. Hoskins | Periodontics |
| Maxwell | Maj. Charles J. Mahan | Periodontics |
| Sheppard | Lt. Col. Frank H. Ketchum | Oral Surgery |
| Lackland | Lt. Col. Kenneth D. Rudd | Prosthodontics |
| Lackland | Lt. Col. William G. Sprague | Oral Pathology |

OFFICER TRAINING

the Army Air Forces.

Dozens more were appointed in 1952, including Dr. Wilton W. Cogswell, who for many years taught a highly respected short term Oral Surgery Course in Colorado Springs, Colorado, starting in the early 1950s. Many Air Force dental officers testified as to how "ahead of its time" the course was in Oral Surgery technique. He remained a consultant for many years and received the Department of Defense Medal for Distinguished Public Service. Dr. Miles R. Markley and Dr. Sumter S. Arnim are two renowned experts in their respective fields who served as civilian consultants to the AF Service for many years.

Consultants share their knowledge with the USAF Surgeon General as well as the dental commander at Wilford Hall on professional aspects of the various specialties. They not only visit and correspond with Washington and Lackland AFB, but also interface with selected bases including overseas installations. For many years, they also provided input to oral researchers at the School of Aerospace Medicine at Randolph AFB.

Consultants provide input to Command Dental Surgeons Conferences and all Air Force teaching facilities with lecture sessions, teaching seminars, and occasional patient interaction. During visits, they assess the material, equipment, and professional standards employed by Air Force clinics. By the early 1960s, the number of civilian consultants declined to six because by that time, the Air Force had began depending more on its own highly trained graduates of residency programs at Lackland.

Base Consultant Program

This program allows for Air Force personnel and their dependents to receive essential dental care when it was not available at a nearby military installation and transportation to another facility would be detrimental to the patient's health. Government funds are provided whereby civilian specialists, if available in the local area, can be utilized.

Military Consultant Program

With the establishment of residency training programs at Lackland in the 1950s, the opportunity arose for the Dental Service to allow broader utilization of its own Air Force dental specialists. The result was greater access of patient

care as well as increased consultation and teaching services to Air Force general dental officers. The Military Dental Consultant Program was initiated in January 1961. Specialists assigned to strategically located dental facilities would semi-annually visit respective bases in their region. The referral process for special needs patients was expedited, and a greater avenue of information and communication with trained specialists was available to the general dentists.

As of 1999 there were twelve military consultants to the USAF Assistant Surgeon General for Dental Services.

| | |
|----------------------------------|---------------------------|
| Dental Investigation Service | Col. Daniel L. Leonard |
| Dental Laboratories | Col. Regan M. Salamander |
| Dental Public Health | Lt. Col. Gary C. Martin |
| Education | Col. Richard M. Faner |
| Endodontics | Col. Steven R. Hansen |
| General Dentistry | Col. Steven D. Westbrook |
| Pediatric Dentistry | Col. Nicholas J. Levering |
| Periodontics | Col. Michael P. Mills |
| Prosthodontics | Col. Michael A. Mansueto |
| Oral And Maxillofacial Pathology | Col. Craig B. Fowler |
| Oral And Maxillofacial Surgery | Col. William L. Davenport |
| Orthodontics | Col. Kirk D. Satrom |

FACILITIES AND STAFFING

In 1949 and 1950, the American Dental Association sponsored bills to Congress calling for “more efficient dental care for the personnel of the U.S. Army and Air Force,” and for staffing that would approximate two dental officers for every 1000 active duty persons. Most existing WWII dental clinics were inadequate in size and functional capacity. Many contained huge operating areas where as many as a dozen or eighteen dentists worked side by side. Patient privacy was compromised. Gen. George Kennebeck’s office provided input for the new standard design of the AF clinics, emphasizing that each patient was to be treated in private, therefore, no operatory was to have more than one dental unit. Subsequent requirements for dental facilities established that there would be one operatory for each dentist, as well as one operatory per 1500 military people to be utilized by hygienists.

The initial strength of the Air

The plans for constructing new dental facilities emphasized each patient’s right to privacy in the dental operating room.

*USAF Medical Service
Digest, Feb 1953.*

Force set by Congress in 1949 was 502,000 with an approximate ratio of two dental officers per 1,000. In order to facilitate the procurement of the necessary 1900 Air Force dentists, the Senior Dental Program was initiated. To help with



Maj. Gen. Marvin Kennebeck cuts the ribbon for the opening of Bitburg AFB Dental Clinic in West Germany, July 21, 1953. USAFE Command Dental Surgeon Walter Reuter, right

recruitment, beginning in 1962, all dentists in the Air Force were commissioned as captains. Prior to this time, they entered the Air Force as first lieutenants.

A program for constructing AF dental clinics began in early 1951, and by 1955, eighteen clinics had been completed of the forty-seven authorized by Congress. Clinics of six or more operatories were to be housed in separate dental facilities. In addition to new construction, many of the existing Army air base dental clinics were modified and used as much as possible. Dental

prosthetic laboratories were to be established at AF bases in order to relinquish need of Army dental labs.

By the late 1960s, modular case-work guidance was advocated for dental treatment rooms, and by the early 1970s, many Air Force bases had dental facilities designed for four-handed dentistry and centralized sterilization rooms. Today, the Dental Investigation Service at Brooks AFB, Texas, provides most of the guidance in facility construction or remodeling.

One important point to be high-

FACILITIES AND STAFFING

lighted is that the Air Force throughout the years has diligently sought to provide sufficient worldwide dental staffing to provide efficient dental care. For example, in theaters of combat such as Vietnam, the Air Force provided adequate ratios of dentists to troop levels. The peacekeeping and humanitarian missions of today's armed forces are also adequately supported with dental components. Remote Air Force installations such as the early aircraft warning sites, were supported with mobile dental clinics. These were developed by Sydney G. Gordon in the early 1950s. He was also the first Air Force dentist to serve as Dental Surgeon of the Tri-Service Medical Board in Washington in 1963.

During its first 25 years, there were about 300 dental clinics, but that number has steadily declined since 1973. The highest levels of dentists in the Air Force were at the end of the Korean War and during the height of the Vietnam War. At those times, there were approximately 2,000 dentists. Today shows the lowest numbers of facilities, (currently 80) and dental personnel the Air Force has ever had. As of 1999, there are approximately 1100 dentists, 2200 assistants, and 460 laboratory technicians. USAF leaders have tried to adequately support the mission during times of downsizing, such as the 1990s, always concerned that insufficient manning would jeopardize mission effectiveness. Beginning in the early 1980s, with the Reagan build-up, there was congressional concern about the possibility of shortages of military dentists, and the feasibility of civilianizing dental care within military facilities. In fact, the Air



Multiple open room operator, Sheppard AFB, Texas, early 1950s. Air Force clinics soon converted to single operator treatment rooms



Mobile Dental Clinic developed in early 1950s for remote early aircraft warning facilities of Air Defense Command.

FACILITIES AND STAFFING

“The Air Force Dental Service must be capable of maintaining a person dentally fit for any duty regardless of where assigned; the Dental Service must operate on a program of equal distribution of worldwide facilities and staffs.”

Semi-annual History of Surgeon General’s Office, 1955

Force was able to recruit its authorized quota of general dentists but still had trouble securing the necessary numbers of specialists. To deal with the latter problem, the Dental Service increased the number of general dentistry residents whose advanced training helped Air Force patients receive specialized care when needed.

To deal with the resultant manpower shortage and not undermine the mission, the hiring of contract civilian dentists was authorized in 1986. By 1990, there were almost 100 employed within Air Force dental clinics., while today there are approximately fifty. With the strong economy of the 1990s, dental school graduates have sought the more lucrative civilian practice. Dental leaders in

Washington have struggled to commission the necessary numbers of dentists to support the mission, but articulate that both medical and dental needs of the Air Force clientele was best achieved with “blue suit primary care for blue suiters.”

If one were to look at the 50-year history of the Dental Corps, on average, there were at least 1500 dentists in uniform per year. A conservative estimate with that number would generate an annual production of four million patient visits and 16 million dental procedures.

Air Force leaders have continually communicated in the political arena that the best way to support the dental needs of the military is to have dentists in uniform.

CIVILIAN SUPPORT

Since its inception, the Dental Corps has had necessary civilian support within its facilities. Today there are about 45 hygienists, 150 dental assistants, 50 lab technicians, 140 secretaries and typists, as well as several hundred Red Cross volunteers. The civilians can have a strong influence on assuring smooth day-to-day operations of any given clinic.



Dee Rollins of the Robert L. Thompson Dental Clinic at Dyess AFB, Texas, has given many smiles during her numerous years of helpful support.

FACILITIES AND STAFFING

FACILITIES NAMED IN HONOR OF USAF DENTAL OFFICERS

- ◆ MacKown Dental Clinic at Lackland AFB, Texas was dedicated in 1965, and named after John L. MacKown, Jr., who had served as Base Dental Surgeon at Lackland. Col. MacKown was one of the Air Force's first and highly respected oral surgeons. He died on active duty in 1964. He had served as a general dentist in the Army during WWII and completed oral surgery training prior to becoming one of the charter members of the 1949 Air Force Dental Service.
- ◆ Dedicated in 1977, Kiecker Dental Clinic at Seymour-Johnson AFB, North Carolina, was named in honor of Lt. Col. Paul L. Kiecker, killed by a plane crash in Vietnam in 1967. At the time, he was Base Dental Surgeon of the clinic at Cam Rahn Bay.
- ◆ Dunn Dental Clinic at Lackland AFB was dedicated in 1980 for Brigadier General Benjamin W. Dunn who died in 1966 while serving as Assistant to Surgeon General for Dental Services. He was regarded as an outstanding prosthodontist and promoter of post-graduate training.
- ◆ Robert L. Thompson Dental Clinic at Dyess AFB, Texas, was dedicated in 1996 to the late Major General, who served as Chief of the Dental Service in Washington from 1975-1979. He was the first Air Force dental officer to have a hospital named after him, at Carswell AFB, Texas. When that hospital closed in 1995, the dental clinic at Dyess was named in his honor.

OPENING THE RANKS

The emergency needs of World War I resulted in the first African-American dentists being commissioned in 1917, in support of the large influx of black soldiers. Approximately 250 black medical and dental officers served in the war. A majority of the dentists were graduates of Meharry and Howard, both dental colleges for black students.

During World War II, about one percent of the Army dentists were of minority status, with 132 of them being African-American. Unfortunately, tracing the history and contributions of minority dentists to the Air Force is next to impossible. As of today, it is unknown how many black densts

have served in the Air Force, or who were among the first. Statistics as to the numbers of African-American Air Force dental personnel remain unavailable. For many years, the Armed Forces kept indexes of name files, but by the time of the formation of the Air Force, a decimal system was in place which was not as specific about a person's background. As one Military Dental Historian working in the National Museum of Dental History implied, "archival research is harder in the post World War II years.... oral histories are the primary avenues of documentation."

Currently, about 12 percent of Air Force dentists are minorities, with blacks comprising about four percent.



Col. Hampton Green, Jr.

REFLECTIONS

*"I Loved My Air Force Career."
Col. Hampton Green, Jr.*

In 1954, I entered the Air Force right out of dental school and served thirty years. I don't know who the first African-American dentist was that wore the Air Force uniform. There were a few on active duty before me, such as B.C. Swayze, Francis Davis, Phillip Drake, Gene Derricotte, and Dr.'s Simmons and Callion (I don't remember their first names), and others whose names I don't know. There were a number who became career officers, and obviously others that came in during the 1950s who served their one tour of duty. I'm not aware of the percentage of black dentists within the Dental Corps throughout those years, but I'm fairly sure I was among the first to achieve full colonel in 1971, possibly the first. Col. Richard Ferguson came on active duty about the same year as I and made full colonel about the same time. He was a graduate of Meharry Dental School, one of the oldest in the country graduating black dentists.

The important thing is that I can honestly say I enjoyed my whole career. I worked with great people, had good assignments, and there were always educational opportunities to further my dental knowledge and skills. I can't think of any part that I have a desire to forget.

I take pride in the same things as other retired Air Force dentists. The fact that the Dental Corps provided superior dental care, always sensitive to their patient's needs, and always supportive of the mission. When I visit the dentist now for my own dental needs, I'm reminded how Air Force dental researchers helped the profession in developing equipment, preventive measures, and so forth.

I became the base dental surgeon at Dover AFB in 1973 and remained in that position until 1981. That was the time females began to enter the Dental Corps. I had heard of Dr. Raya Rachlin in the early 1970s but cannot recall any other women dentists until the middle of the 1970s. We had several at the Dover Dental Clinic, and I believe the first to arrive at our clinic was around 1976. I gave them the same additional duties and responsibilities as any other junior dental officers, and they did very well.

FOOTNOTE: Col. Green's last assignment was at Malcolm Grow Medical Center, Andrews AFB, MD, where he served as Director of Dental Services before retiring in 1984.

OPENING THE RANKS

FIRSTS FOR WOMEN IN THE AIR FORCE DENTAL SERVICE

1953 Raya Rachlin, first woman to be commissioned into the USAF Dental Corps.

1983 Ellen M. Simmons graduated the two year General Dentistry Residency at WHMC. (Seven more have followed)

1985 Becky L. Gering, first woman selected as Base Dental Surgeon.

1987 Fay M. Fagley and Kathleen A. Lindell graduate Wilford Hall periodontic residency program. (Four more have followed)

1987 Susan L. Gream, first female dental enlisted person to be promoted to Chief Master Sergeant. (Five more have followed)

1993 Barbara G. (King) Bisang graduated prosthodontic residency at WHMC.

1994 Becky L. Gering and Ellen M. Simmons first women USAF dentists promoted to colonel (on the same date).

1997 Robin E. Hinricks graduated WHMC Endodontic Residency.

1998 Col. Susan J. Smythe, first female appointed to a Command Dental Surgeon position, Space Command, Peterson AFB, Colorado.

1999 Rose M. Leary, current resident of Oral and Maxillofacial Surgery Program at WHMC.

Three bills were introduced to congress during WWII to allow commissioning female dentists into the Army, but none passed. Meanwhile the Navy did commission two women dentists during the war. In 1949, the Army Medical Dept. Act was introduced, and after passage the following year, allowed the Army and Air Force each 25 positions for female dentists. In 1951, the Army commissioned its first woman dentist.

The first woman to serve as dentist

for the Air Force was Raya Rachlin, who joined in July, 1953. Although legislation in 1950 had opened the doors, the reality is that only four women had served as dentists in the Armed Services up until the late 1960s. During the early 1960s, Maj. Rachlin was the only female military dentist; however, the fact is, just over one percent of American dentists were female until the early 1970s. By 1983, the number had increased to only three percent. There were not many women in uniform during

those years; however, in the late 1970s and throughout the 1980s, about 10 percent of USAF dentists were women. Today about 36 percent of dental school applicants are female, and represent about 13 percent of the total number of American dental practitioners. As of 1999, over 13 percent of the USAF dental officers are female.



Capt. Raya Rachlin



CMSgt. Susan L. Gream



Col. Becky L. Gering

PREVENTIVE DENTISTRY

Since the early years of its formation, the Dental Service of the Air Force has vigorously pursued preventive dentistry for its patient clientele. General Marvin Kennebeck appointed Kenneth R. Elwell as Chief of the Preventive Dentistry and Research Division in 1952. Col. Elwell initiated a preventive dentistry program that is credited as the first to be officially organized within the military services. It was incorporated into every Air Force dental facility worldwide.

The following goals were established for the program: A minimum of one annual prophylaxis for each military person was to be accomplished; efforts were to be expanded to educate and promote the personal interest of airmen in daily oral hygiene; and each base would have an assigned Preventive Dentistry Officer, often the periodontist.

By 1954, the Inspector General's office reported that 90% of Air Force bases had implemented Preventive Dentistry Programs.

Medical Service Digest, June, 1955.

In reality, the Air Force had already taken its first steps in preventive dentistry. USAF officer, Hubert Palmer, since 1949 had been engaged in bacteriology research, a special study on caries etiology at the Research School of

"The Preventive Dentistry Program is the cornerstone of Air Force Dentistry."

*Col. Bruce A. Matis
USAF Preventive Dentistry Consultant
to Surgeon General's Office, 1988.*

the Army Medical Center in Washington DC, which the Air Force stated was "most desirable in our preventive dentistry program." Additionally, beginning in 1949, the Air Force sent hundreds of dental airmen to the Great Lakes Naval Training Center to receive training in oral prophylaxis and by 1952, over 1200 had graduated.

The high incidence of oral disease among the young military troops drove the need to educate them on simple preventive measures. In 1950, 90 percent of military recruits were in need of restorations, with each airman averaging eight cavities. Approximately 30 percent required extractions, and 19 per-

cent needed dentures. The oral condition of the general populace was no better; however, because personnel within the Air Force require a high degree of oral health, its dental workers were tasked with a challenging workload. The profession as a whole, as well as the military, realized preventive efforts had to be expanded.

The concept of fluoridating water supplies as a preventive measure also gained interest during the early 1950s. In October, 1953, the Chairman of the National Research Council (NRC) drafted a letter to the Surgeon



Prophylaxis Training at Sheppard AFB.

PREVENTIVE DENTISTRY

General stating that the Committee on Dentistry of the National Research Council “believes there is sufficient evidence of the merits of fluoridation of public water supplies to justify its use on military posts wherever feasible, and especially where there is a child population in residence.”

This preventive dental concept had continued to gain respect for some time. The USAF Surgeon General’s Office approved a proposal to fluoridate the water supply of Ramey AFB, Puerto Rico, on June 23, 1954, the first U.S. military base to do so. Carlos F. Schuessler, the Base Dental Surgeon, was a well known oral researcher and had a keen interest in preventive dentistry. His efforts were successful in helping this to transpire. The number of Air Force bases fluoridated rose to al-

Ramey AFB was the first U.S. military installation to fluoridate its water supply in Sept, 1954.

most 150 by the end of the 1970s.

In the early 1950s, sodium fluoride was the principal anticariogenic agent used by the profession. By the late 1950s, Air Force dental researchers at SAM began advocating the use of stannous fluoride. This group included Vincent A. Segreto, Norman O. Harris, Warren R. Hester, Robert J. Detamore, and Ira L. Shannon. Their efforts not only helped in the fabrication of various solutions, dentifrices, gels, and mouthwashes for Air Force use, but heightened the awareness of the dental profes-



Red Cross Volunteers assisting with Children’s Dental Health Month.

sion on the benefits of stannous fluoride.

During the early 1960s, Col. Harris was instrumental in having the Air Force establish the position of Preventive Dentistry Officer (also referred to as the Dental Health Officer) for the Dental Service. That individual at Brooks AFB, Texas, is responsible for supervising the USAF Preventive Dentistry Courses held at that base. Coursework started in 1964, and continues to this day.

Paul V. Sundberg, Jr. and John E. Devlyn held the post during the sixties. They developed training aids, films, and guidance to expand preventive dentistry awareness in all Air Force clinics. Eugene R. Muth helped initiate the Preventive Dentistry Specialists Course for enlisted personnel at Lackland AFB in 1967. The course trained experienced dental assistants to administer dental prophylaxis. It was taught for a number of years at Sheppard AFB, and, after several curriculum and location changes, returned to Lackland. It is now referred to as the

Advanced Oral Hygiene Course. The curriculum trains experienced dental assistants in dental hygiene therapy, and has proved itself an invaluable asset to the Dental Corps.

Thomas Salimeno, Jr. served as the Preventive Officer at Brooks from 1967-1975. He was noted to have introduced the concept of Plaque Control Centers within dental clinics as educational tools to the patients. He was followed by Arden G. Christen and Albert C. Jerman, who both encouraged community dentistry. The preventive dentistry efforts at Air Force bases were to reach out in support of their local communities. Each

The USAF Preventive Dentistry Program established in the early 1950s, was the first officially integrated program of preventive dental services in the Armed Forces.

PREVENTIVE DENTISTRY



Col. Arden G. Christen

clinic was not only to have a Base Preventive Dentistry Officer, but an Assistant Preventive Dentistry Officer who would soon help in such activities as community health fairs, dental health month, fabrication of mouthguards for athletic teams, and dental prenatal classroom presentations.

During the late 1970s, the profession became more aware of safety within the dental environment as well as dentistry's increased role in the overall health care assessment of the patient. Col. Christen's leadership provided guidance for Air Force dental clinics

to deal with mercury hygiene, eye protection, aerosols, noise control, stress reduction, accident protocol, and occupational disease prevention. Air Force clinics began to initiate health screening measures such as high blood pressure determination, tobacco education programs, cancer detection, and prophylactic measures for medical conditions such as rheumatic fever. By the early 1980s, Air Force dental clinics had environmental health and safety officers. The numer-

REFLECTIONS

"THERE IS MORE TO DENTISTRY THAN JUST TREATING THE MOUTH"

COL. ARDEN G. CHRISTEN

Early in my Air Force career, I began to realize that we as dentists often tend to be over-focused on the mouth, and get stuck in "tunnel vision." I wanted to broaden my perspective, so I completed a two year oral diagnosis/oral medicine residency during the early 1960s. My training included preventive dentistry topics which exposed me to community dental health issues. This was about the time that both medicine and dentistry became more aware of public health measures.

After my residency, I was sent to Lackland where I helped form the first general practice dental residency for the Air Force. Several well known national dental consultants such as Sumter Arnim and Miles Markley had provided tremendous input and emphasized that quality dentistry and preventive dentistry are one and the same. Teaching oral diagnosis made me ever mindful of the damage that tobacco does to the gingival tissue. I quit my own smoking habit cold turkey in 1968 but soon realized that some individuals needed extra help to break their habit. Very little had been written on the oral and systemic dangers of smoking and not many avenues were available to help educate the public or help them stop smoking. By the early 1970s, I was writing and speaking against the use of smoked and smokeless tobacco which I have continued to do to this day.

I always like to tell the story of "Smoking Sam," a mannequin that could mechanically smoke a real cigarette. We would take it to the schools and when the kids saw the angel hair in the mannequin's glass lungs turn dark from a few cigarettes, they were really impressed. That was a lot of fun, and the kids responded to the message.

During the 1970s, when I served as the Air Force's Preventive Dentistry Officer at Brooks AFB, TX, we made great strides in heightening the awareness of safety in the dental environment. We contributed many articles in the dental literature on subjects ranging from mercury hygiene, aerosols, noise pollution, radiation safety, environmental protection, and so forth. The Air Force in many respects, was ahead of the civilian sector in such areas. I take great pride in having been an Air Force dental officer.

Footnote: Col. Christen presently teaches Preventive and Community Dentistry at the Indiana University School of Dentistry within the Oral Biology Department. He also teaches dental history and was recently honored by the American Academy of the History of Dentistry for his numerous contributions in this arena. His distinguished career continues as he currently serves as the Dental Consultant to the National Cancer Institute, as well as the Tobacco Consultant to the Council on Access, Prevention, and Interprofessional Relations for the American Dental Association.

PREVENTIVE DENTISTRY

ous publications by Col. Christen in the dental literature during those years are exemplary contributions of Air Force dentistry to the profession and to the public.

Robert Mayhew and Bruce A. Matis in the 1980s emphasized the use of sealants. A comprehensive study of the effectiveness of sealants on the 18-22 year age group was one of several research efforts conducted under Col. Matis's leadership. He also has had a number of articles in both civilian and military publications. While at Brooks AFB, he chronicled the history of Air Force Preventive Dentistry.

Following Col. Matis, in the position of Special Consultant in Preventive Dentistry was Laurence P. Crigger in the early 1990s. During that time frame, the Medical Service began to emphasize prevention, fitness, and wellness is-

sues. USAF dentistry had been involved in prevention efforts for decades and was well suited to provide expertise in these areas. The Dental Corps experiences could contribute significantly to the mission of the medical colleagues. However, Col. Crigger felt the dental input would have a greater influence if presented from a broader perspective, that is, from a public health viewpoint. He recommended that the next person in his position be a dental health specialist. Unfortunately, at that time, no active duty Air Force dentist had training in that specific discipline. An opportunity soon evolved for that to transpire when Air Force dentist Gary C. Martin was scheduled for a Dental Public Health Residency.

DENTAL PUBLIC HEALTH

Public health dentistry was recognized as a specialty by the ADA in 1949. Kenneth R. Elwell was the first Air Force dentist to have completed training in this new specialty, in 1956 at the University of Michigan School of Public Health. It is not recorded if other Air Force dentists with formal dental public health training followed after him until recently. Now serving as the Dental Public Health Officer for the Air Force at Tri-Service Center for Oral Studies in Bethesda, Maryland, is Gary C. Martin.

Lt. Col. Martin points out how prevention is still the main emphasis, but the perspective is broader. His office provides USAF dental clinics guidelines for detailed monitoring of caries-susceptible patients. One of the first measures implemented was the use of sealants on USAF members who are at high risk for caries. For example, Lt. Col. Martin's office continues to improve the regulations for oral health screening, as well as monitoring the dental readiness of the USAF population. Currently, over 90 percent of the active duty are qualified for overseas duty. Analyzing dental disease levels of military personnel also better determines adequate ratios of specialists and dentists to troop levels in order to avoid compromising the Air Force Mission.



Air Force dentistry observes state of the art Infection Control Policy.

ORAL RESEARCH

In 1948, efforts by the American Dental Association helped secure Congressional legislation to create the National Institute of Dental Research to combat “the appalling extent of dental disease and dental neglect.” The military already had a few individuals working in such places as the National Bureau of Standards (NBS) developing new dental field equipment and testing dental materials, but with more federal funds available, the 1950s would witness a large growth in dental research.

In 1949, a dental research advisory committee to the Army Medical Research and Development Board was created. Lt. Col. Walter Reuter was a member on that committee representing the Air Force Dental Service. That same year, four Army Dental Corps researchers transferred to the Air Force and initiated efforts to build a reputable dental research capac-

The Dental Division supported oral research for two reasons: first to investigate the effects of flying on oral tissues, dental materials and appliances, and secondly, the desire to find ways to improve oral health delivery and maintenance of Air Force personnel.

ity for the Air Force. These included: Carlos F. Schuessler at the Armed Services Engineering Development Division at Ft. Trotten, New York, (testing and development of dental field equipment);



Civilian and Military Research Conference at SAM in 1951. Kermit Knudtson, back row, center. Front row, left to right: Warren Hester, Theodore Fischer, Walter Reuter, Donald Hudson.

Theodore E. Fisher at NBS, (numerous research projects); Warren R. Hester at the School of Aviation Medicine (SAM) at Randolph Air Base, Texas, (Vincent’s stomatitis at altitude, high speed handpiece) and Hubert Palmer at the Research and Graduate School, Walter Reed Hospital, (etiology of caries and preventive possibilities).

Lt. Col. Schuessler who had served in the South Pacific was appalled at the inadequate equipment. He had spent several years at Randolph’s SAM shortly after the war, developing better field equipment. It was in San Antonio that he met Maj. Hester from Ft. Sam Houston who expressed the same frustration while serving in

the Pacific. Maj. Hester was thrilled to be invited to SAM to help research new equipment. Lt. Col. Schuessler’s nationally published research eventually had a positive influence on both dental and medical field equipment design.

Maj. Hester worked on several research projects as well as towards a new focus. He envisioned an expansion of the work being done at SAM to the degree that a Division of Dental Science be created, separate from the Medical Science Division which it had been under since 1945. This was an exciting time for research within the dental profession, with much happening all at once, and ideas for various

ORAL RESEARCH

projects continually surfacing.

Air Force dental leaders in Washington were supportive of oral research for two primary reasons: first to investigate the efforts of flying on oral tissues, dental materials and appliances; and secondly, to find ways to improve oral health delivery and maintenance of Air Force personnel.

By the mid-1950s, approximately a dozen dental officers were involved in oral research. Their efforts would have far reaching implications for the dental profession highlighted in such areas as the high speed handpiece, the panoramic x-ray, and preventive dentistry. Many research projects and studies were conducted at civilian institutions working in cooperation with SAM. The Air Force was very much a part of this progressive era of dental research.

Renamed the School of Aerospace Medicine (SAM), and relocated in 1962 to Brooks AFB, Texas, Air Force dental researchers during the 1960s had the challenging but rewarding task of working with NASA to develop ways to perform oral hygiene as well as treat potential dental emergencies encountered during space flight.

To support the nation's war effort in Southeast Asia, Maj. Malcolm D. Jendresen at SAM developed a stronger temporary restorative material called polychromatic intermediate restorative material (PIRM), designed to wear longer and last up to twelve months.

Another interesting research project conducted at Brooks in the early 1970s termed "laser holography," sought to utilize the rapidly budding computer technology in a dental application. Under the direction of Air Force prosthodontist, John M. Young, laser imaging

photography was used to generate three dimensional computer images of teeth, in concept like a sophisticated hologram. The use of such technology had limitless possibilities in the industrial workplace as well as numerous possible applications in the dental setting. One of the most intriguing was the idea of being able to have a machine fabricate a crown from the computer generated image of a prepared tooth. The laser holography indeed was able to produce the computer image of a tooth; however, the machinery was not sophisticated enough to fabricate a crown to the exact image generated on the computer. Today that technology has arrived.

The trailblazing efforts of laser holography also set the stage for at least another innovative application of today's computers to dental and medical therapy. It will have far reaching positive consequences for the health sciences. Stereolithography, currently used at MacKown Dental Clinic, is a process whereby three-dimensional models of varying materials can be fabricated from laser scanners. The application of stereolithography to the dental and medical work setting has great potential, and Air Force dentists during the 1990s were part of this revolutionary effort. (See page 53)

Throughout the years, Air Force dental residents and staff coordinators have published many studies in the research portion of their residencies

PANORAMIC RADIOGRAPH DEVELOPMENT



The Air Force cannot take sole credit for the panograph (often referred to as a Panorex), because its idea and theory had been around for several years; however, the efforts of Air Force dentists Don Hudson and Jack Hartley at NBS in the early 1950s brought about the actual mechanical workings of the machine. By 1967, all Air Force inductees' initial oral examination included a panograph, a practice that has since become universally encouraged within the dental profession, both military and civilian. Research at SAM in the early 1970s confirmed that a panorex and two bite-wing radiographs exposed the patient to 80 percent less radiation than the traditional full mouth series consisting of eighteen smaller films. Over 60,000 trainees at Lackland now receive a panograph each year. Out of several thousand films evaluated, a significant amount of dental disease is found and potential life-threatening pathology can be diagnosed.

ORAL RESEARCH

HIGHSPEED HANDPIECE RESEARCH

The introduction of the high-speed handpiece to the dental armamentarium was revolutionary, and the armed services played a pivotal role in its development. During WWII and the years immediately following, it was speculated that the fifth most common cause of aborted flights was dentally related. This was an obvious concern to the mission of the Air Force. In those same years, the theory of aerodontalgia had been dispelled; however, the question was raised as to whether or not teeth restored on airmen several days prior to flying were more susceptible to pain at altitude. Did the trauma to the tooth, notably, the vibration and heat generated during prepara-

tion for a filling, create enough of a pulpitis that the tooth could be overly sensitive for several days, and if so, to what degree on flying personnel?

The existing dental drills of the day operated at about 4,000 revolutions per minute (rpm). Was it possible to operate at speeds much higher, even to the point that the dentist could cut tooth structure so quickly and efficiently that little if any heat was generated?

Some of the earliest research involved Drs. Schuessler, Hester, and Fischer at SAM in the late 1940s and early 1950s. They developed a machine utilizing a system of pulleys, much like a ten speed bike, to drive belt hand-

pieces to higher rpms. They concluded that the most efficient and safest operation of the handpiece was rpms greater than 18,000, which actually generated less heat than the standard handpiece of the day, which was soon to be referred to as the slow speed handpiece.

Air Force dentist Jack Hartley arrived at NBS in 1951, continuing the research throughout the 1950s. His efforts resulted in many articles published on the effects of carbide and diamond burs on pulpal tissue when cutting at speeds between 10,000 and 400,000 rpm with proper water coolant.



Warren Hester (L) and Theodore Fisher check out the pulleys in their high speed handpiece research.

ORAL RESEARCH

RADIO DENTURES



SSgt. Sam Palmer in 1966 displays radio dentures fabricated by researchers at SAM.

One interesting research project involved the use of radio transmitters fabricated in prosthetic teeth in order to study the physiological stresses that occur during mastication. Dental researchers at SAM in the early 1960s got the idea from using telemetering equipment that had been developed for monitoring space flight. The Departments of Bioelectronics, Physiology, Audiology, and the Dental Sciences all worked together to incorporate miniaturized radio transmitters in dentures to evaluate occlusal forces during chewing. Col Warren Hester stated, "The FBI came to Randolph to evaluate the workings of such an apparatus; perhaps it was something they could use in their own field of work. It also put an end to our research on this project."

STEREOLITHOGRAPHY

Dentistry interfaces with all aspects of science and medicine. Air Force dentistry is literally on the cutting edge at MacKown Dental Clinic of the Wilford Hall Medical Complex. Stereolithography is a rapid prototyping process for fabricating three-dimensional models from a computer image. Lt. Col. Doug Erikson within the Maxillofacial Prosthetic section points out that the specialized equipment necessary for stereolithography is not uncommon within the industrial workforce, but exists in only one hospital complex in the world, that being at MacKown Dental Clinic, WHMC.

Images from computed tomography (CT), magnetic reso-

nance imaging (MRI), and laser scanners provide the data for the computer that is then used by the sophisticated machinery to generate 3-D models of bones, skulls, teeth, vertebrae, and so forth. The epoxy and acrylic models show surgeons and dentists the true extent of damaged or diseased tissue and help practitioners consult with other colleagues, as well as clients, prior to any actual treatment. It saves lots of operating room time by allowing the physicians and oral surgeons to more accurately shape and mold custom bone plates, implants, and fixation devices prior to starting the surgery.

To date, many patients have benefited enormously from the new technology which improves treat-

ment of gunshot wounds, craniofacial clefts, custom temporomandibular joint replacement, and titanium implants. The separation of conjoined Siamese twins in 1995 was perhaps the most well-documented success story.

Combat medical readiness is improved because field CT scanners can transfer data over the internet, and prototype models can be fabricated while patients are in transport.

DENTAL INVESTIGATION SERVICE

In the post-Vietnam War downsizing period, there was some opposition to continued funding for oral research at the School of Aerospace Medicine, which had relocated to Brooks AFB in 1962. One concern was that the three armed services were duplicating each other's dental research. Another concern was whether the Air Force had been authorized to do oral research since its inception in 1949. The Chief Counsel of the Air Force informed the Dental Service that due to lack of authorization, the oral research program at the School of Aerospace Medicine, Brooks AFB, would no longer be funded as of October 1, 1976.

Fortunately, the Air Force had the right person at the right time and at the right place—John M. Young. A prosthodontist by training with a research background in both engineering and dentistry, he possessed a keen technical problem solving ability. Maj. Gen. Hombs and Maj. Gen. Thompson, both aware of his talents, sought his help. His mission to “fix the research situation” would not be easy.

Col. Young's expeditious efforts resulted in AF Regulation 162-7, which established the Dental Investigation Service (DIS) on October 1, 1976. The purpose of DIS is to provide investigative information and assistance to USAF dental personnel by solving operational problems and to give guidance on existing dental techniques, equipment, and armamentarium. The laboratory, clinical, and consultant capabilities of DIS are an integral part of the USAF School of Aerospace Medicine. Their

technical assistance has developed into an invaluable support of the Dental Service and the Air Force mission. Col. Young takes no hesitation in saying, “I think we have had a positive influence on the technical side of dentistry, not just for the Air Force, but also for the profession.”

He is also adamant in reiterating that DIS does not do research, but only evaluates equipment as requested by Air Force clinicians. “No one is ever told what to buy, only what works and doesn't work.” Personnel at DIS point out that manufacturers do not send equipment expecting DIS to evaluate it for them. Rather DIS selects equipment as requested by Air Force clinics to examine and determine if it is suitable to provide adequate clinical treatment. This is done in an effort to determine which equipment is best to help each dental officer provide quality

care to his patients, and to save Air Force money by purchasing equipment that will last.

In order to best disseminate information from findings at DIS, the newsletter “Dental Items of Significance” is published and provided to all USAF dental clinics as well as other interested governmental agencies. DIS website information is also available via the internet.

Throughout the years, investigators at DIS evaluated existing practice standards regarding hand-piece maintenance, mercury hygiene, appropriate lighting, infection control measures, radiation safety, and dozens of other areas of interest to determine which equipment and operator technique provide the safest working environment for both patient and doctor.

The efforts of DIS helped elevate Air Force dentistry to leadership in infection control measures. By the early 1980s, Air Force den-



DENTAL INVESTIGATION SERVICE

tal clinics each had an Environmental Health and Safety Officer assigned among their dentists. Civilian dentists may have felt pressure from OSHA in the late 1980s; however, Air Force dental clinics had been doing such procedures for years. Much of the credit is due to guidance from DIS.

By the 1990s, DIS also began to have a heavy influence in providing guidance for new facility construction as well as upgrading existing AF dental clinics in order to increase the efficiency of dental care. DIS must now be consulted prior to such

transactions.

Currently the Director of DIS participates as a military consultant to the ADA Sponsored Accredited Standards Committee of Dental Materials Instruments and Equipment.



Col. John M. Young

REFLECTIONS

“WE DON’T DO RESEARCH, ONLY INVESTIGATION ON EQUIPMENT AND MATERIALS TO BE PROVIDED TO USAF DENTAL CLINICS.”

COL. JOHN M. YOUNG

Before entering the Air Force, I had a degree in Chemistry and had worked as a research chemist in an engineering capacity while working through dental school. In the early 1960s, I completed an Air Force sponsored prosthodontics residency. After a tour in Vietnam, I taught briefly at Lackland until a research position at Brooks AFB opened up in the prosthodontics section. It sounded like what I wanted, but I was a little disappointed in the amount of paperwork we had to do just to justify any research we did, and even worse was the paper trail which prevented us from having any direct contact with the Air Force dentists who needed timely answers to everyday equipment problems.

This was the early ‘70s, and the Armed Forces were going through downsizing and a review of funding, you know how that goes. Well, the problem was, by regulation, the Air Force never was officially “authorized to do oral research.” It had been done understandably to study dental problems encountered with flight as well as to help the Dental Corps in treating Air Force personnel. That makes sense to you and me, but you have to understand policy in Washington. If something doesn’t have a specific regulation or authorization by Congress, it can be cut, and it was going to be cut on 1 Oct, 1976. To make a long story short, I was able to write and get a regulation passed whereby the Air Force would *not* do research, but only *investigate* equipment and supplies that Air Force clinicians inquire about. The Dental Investigation Service at Brooks AFB doesn’t tell anyone, including the Air Force, what to buy, only what works and how well. We don’t tell manufacturers how to improve their equipment. We are tasked to investigate complaints and inquiries from the field and make recommendations on which equipment works. Also it can now be done over the phone, not the long paper trail. This is what I envisioned it doing when it was started on 1 Oct, 1976, and from my understanding, still operates pretty much the same way. This was “my baby” and I’m proud of it.

FOOTNOTE: Col. Young is a clinical professor of general dentistry at the University of Texas Dental School in San Antonio. He presently works with NASA in developing dental treatment instruments for use in weightless environments for emergency dental procedures during spaceflight.

ORAL PATHOLOGY

Oral and Maxillofacial Pathology was recognized as a specialty by the ADA in 1950. At that time, there were only about a dozen oral pathologists in the country, and the Air Force was fortunate to have one join its ranks in 1952. William G. Sprague would be the Air Force's only oral pathologist until the mid-sixties. In his own words, "Air Force oral pathology for many years was me, myself, and I."

Oral pathologists within the Air Force ranks throughout the years regarded him as the Father of Air Force Oral Pathology. One of his early assignments was at the Armed Forces Institute of Pathology (AFIP). Shortly thereafter, in 1956, he was transferred to Wilford Hall at a time when all residents were being established. He was tasked with teaching oral pathology to students of all residencies. It would not be until the sixties that the Air Force acquired more oral pathologists, including John Cornyn and Southern P. Hooker. Both had been B-17 pilots in WWII, the former in Europe and the latter in the Burma-India theater of operations.

Col. Sprague has been described as resourceful, of gifted intellect, dynamic, aggressive, and far-sighted. His efforts trail-blazed a path whereby future Air Force oral pathologists could indeed practice their specialty where it is most productive, that is, inside medical pathology departments and not isolated to the dental environment. He assured that Air Force oral pathologists would not only be clinical pathologists but also microscopic diagnosticians.

The Air Force at its peak had

six oral pathology centers that directly assisted USAF dentists in the diagnosis of intraoral lesions. Consequently, Air Force dentists not only had a more accessible communication avenue, but received information and feedback quicker, enabling patients to be diagnosed and treated more expeditiously. These biopsy centers were largely a result of Col. Sprague's vision.

Col. Sprague served as chairman of the Department of Oral Pathology at AFIP from 1965-1969, arguably the most esteemed oral pathology position in the world. Air Force dentists to follow in his footsteps at this position were Southern P. Hooker (1976-1979), Kenton S. Hartman (1984-1987), and Robert B. Brannon (1993-1996).

In addition to biopsy analysis, USAF oral pathologists provide expertise in teaching, consultation, research, and forensics. They not only serve as a valuable support to the Air Force mission, but have provided a significant contribution to the dental profession. Air Force oral pathologists have written hundreds of published research papers, including some "classic" ones that will stand the test of time. Considering there have been only about two dozen Air Force oral pathologists in fifty years, this is of noteworthy mention.

Col. Hooker's research in the late sixties identified a lesion known as the ameloblastic fibro-odontoma, an innocuous growth treated today with simple curettage. Prior to that time, the entity was confused with the aggressive ameloblastic odontoma which requires extensive radical surgery. This not only expanded the exist-

ing diagnostic spectrum of ameloblast odontomas, but for those patients not needing radical surgery it was an obvious godsend. Many a patient's jaw have been saved because of his contribution.

Col. Brannon is credited with compiling one of the largest studies ever on keratocysts, which has spawned numerous publications and has significantly contributed to oral pathology's diagnostic repertoire. Today the specialty is referred to as Oral and Maxillofacial Pathology.

"Air Force oral pathology for many years was me, myself, and I."

*Col. William G. Sprague,
Father of Air Force
Oral Pathology*

FORENSIC DENTISTRY

Dentistry's contribution to the forensic sciences has become much more prominent within the last twenty-five years. Air Force dentists have been active participants and contributors in the recent progressive developments within forensic dentistry. Forensic odontology is now a vital team player among such others as forensic anthropology, forensic pathology/biology, and forensic toxicology. But the team is bigger than that, including others such as criminalistics and jurisprudence. Consequently, forensic dentistry is more than just identifying remains; it is an active participant in the legal processes of our society.

The Army used form DA 8-116 during WWII to help in dental identification, as well as Medical Form 79, which included a dental section. However, it is of historical interest to note that Army Air Corps dentists within the 8th Air Force in England developed its own Flying Personnel Dental Identification Form. Faced with the task of identifying bodies mutilated and charred beyond recognition, dental officers made it mandatory for newly arriving flying personnel to complete the form. The dentists were credited with identifying with certainty many individuals who probably would have remained unknown. Throughout the following years, many USAF dental officers provided a very necessary contribution to the Air Force mission by being tasked with identifying flying personnel killed in air accidents.

One of the original staff officers of the Dental Service in Washington, D.C., Col. Walter R.

Reuter, had been a command dental surgeon with the Eighth Air Force during WWII and realized that dental records needed an improved method of recording dental disease and completed restorations. In the early 1950s, he formatted AF Form 309 for use in initial dental processing of Air Force personnel. Currently, all of the Armed Forces use SF 603, which is essentially the same as AF Form 309.

In 1962, the first forensic odontology course ever taught took place at AFIP, and it remains the most highly regarded of all forensic dentistry courses taught in the world. USAF dentists throughout the years have participated as instructors in the curriculum.

In the mid-1970s, Dover AFB became the nation's primary identification lab for all military personnel. The initiative and leader-

During the 1970s, Air Force dental officers helped establish the mass disaster forensic identification protocol utilized throughout the country today.

ship capabilities of AF forensic dentists obviously contributed to Dover being selected. It was also during this same time frame that forensic odontology began to play a pivotal role in the management of mass disaster casualties.

This began in the 1970s under Southern P. Hooker's leadership at AFIP when he assembled a team of Air Force forensic dentists to assist Pan Am Airlines with the Pan Am/KLM Tenerife crash on the Canary Islands. He

displayed exceptional initiative, but could not have done it alone. Others with organizational and management skills such as William M. Morlang provided invaluable assistance. The two can be largely credited with creating the mass disaster protocol utilized throughout the country today. Other tragedies included the Jonestown Guyana tragedy, the crash of a Polish airliner with the US Olympic Boxing team, the terrorist attack on the Marine barracks in Beirut, and the Battleship Iowa explosion. The identification of human remains is a tremendous benefit to surviving family members, expediting insurance matters, estate settlement, and wrongful death suits.

When mass disasters occur, it has become the responsibility of AFIP to deploy military personnel to both the accident sites as well as Dover AFB. Up to seventy-five cases a day can be handled at Dover, but more could be processed if necessary as was evidenced by preparations for the Gulf War.



Col. William M. Morlang II served as Consultant in Forensic Dentistry to the USAF Surgeon General for many years. See his "Reflection" in "Aeromedical Dentistry."

COMBAT DENTISTRY

WORLD WAR II

Dental officers assigned to field units within a war zone during WWII were often exposed to the hardships and risks of the troops with which they were deployed. Dentists were involved with airborne and assault operations in Europe, including ski patrol and paratroop functions, as well as the jungle operations of the

Pacific. The Army recorded 20 dentists who were killed in action, while 60 were wounded, 5 of whom subsequently died. Disease and non-combat accidents took the lives of 81 dentists.

Invasion forces often utilized their dentists as triage officers and assistant surgeons. Some were employed for months at a time in a medical status. One dental officer remarked, "I gave more plasma than I inserted fillings."

In essence, dental officers were expected to be prepared for emergency assistance and other additional duties until the combat subsided. Dental chests, as well as "backpack" dental kits, were often utilized as necessary during a lull in the fighting. These were especially helpful in jungle terrain when ordinary dental field equipment proved inoperable. However, it was prudent to return dental officers to their normal duties as soon as possible in order to prevent evacuations and lost manpower hours due to dental ills.

Dozens of military dentists were held as prisoners. European statistics are incomplete regarding dentists held in captivity. However, in the Pacific, 53 American dentists were held in Japanese prisoner of war camps. Maj. Frederick H. Richardson, Jr. and 1st Lt. Alex M. Mohnac were captured in the Philippines with Corregidor's fall in the spring of 1942. Both survived four years in Japanese camps, and they each transferred to the Air Force in 1949. Mohnac had had oral surgery training and served as the POW camp anesthetist using Red Cross procaine and pontocaine. During the early 1960s, he served as one of the early directors of the oral surgery residency at Wilford Hall.

A number of Army dentists who had served under such adverse and hostile conditions of World War II were among the original cadre of 175 dental officers that transferred to the Air Force in the summer of 1949.

The following quotes were taken from the book *A History of the United States Army Dental Service in World War II*:

- ◆ "Thousands of dentists who had always enjoyed every convenience in their civilian offices soon found themselves operating with dental field chests on tropical islands, or at the edge of arctic glaciers."
- ◆ "During an invasion, dental officers must be prepared to assume other duties until the situation has stabilized."
- ◆ "I gave more plasma than I inserted fillings."
- ◆ "A unit which entered combat could go for some time with emergency dental care only plus the sporadic attention that was available between periods of fighting, but lack of definitive treatment eventually resulted in reduction of combat efficiency due to excessive evacuations for dental causes."

COMBAT DENTISTRY

REFLECTIONS

“PEOPLE UNDERESTIMATE HOW INCAPACITATING A TOOTHACHE IN THE FIELD CAN BE.”

COL. WARREN R. HESTER

I was an ARMY ROTC dental officer in school graduating in 1941, just before America entered the war. Shortly after Pearl Harbor, in the spring of 1942, I was sent to the Solomon Islands. The fighting on Guadalcanal was horrendous, as you know. It literally went on day after day for six months. If I was not treating a dental patient, I would help the medical officers. There were plenty of dental ills to treat, let me tell you. Hardly a day went by without toothaches and fractured jaws, and they were real emergencies to the fighting men. People underestimate how incapacitating dental ills can be to the troops in the field. We worked every day knowing the enemy was not far away, and often I could hear the machine guns and mortars while I treated patients. I recall one instance when the fighting was not more than several hundred yards away and had been going on for some time while I was treating one of the soldiers. A general came up behind me and asked, “What the hell do you think you are doing?” My response was, “What the hell do you think I’m doing?”

The equipment was ridiculous, left over from WWI. We had to improvise everything. Extractions and setting of fractured jaws had to be done by feel as we had no x-rays. The old fashioned pump pedal may have been a blessing since we didn’t have electricity. I even did some metal crowns by rigging up a manual sling casting machine inside a large potato can.

The medical personnel were overwhelmed. We had 1500 patients crammed into a 200 bed field hospital. The equipment sent from stateside required electricity, and guess what? We didn’t even have generators. I remember telling myself, I hope no other dentist has to go to war as unprepared as we were.

FOOTNOTE:

Captain Hester was wounded on another South Pacific island before returning stateside. In 1948, he was assigned to Randolph’s School of Aviation Medicine where his research activities included the development of new dental field equipment. In his own words, he had a “passion” for his work. He transferred to the Air Force in 1949.



Col. Warren R. Hester

KOREA

Unfortunately, no information regarding the numbers and activities of Air Force dental personnel assigned within Korea during the war are on record. Fortunately, no USAF dentists or their assistants are known to have been killed in theater. It is recorded that the severe shortage of dental personnel at the outbreak of hostilities in 1950 persisted throughout the war.

The concept of area dental support rather than unit support developed in Korea. In essence, medical and dental officers were not as close to the front lines as in previous wars. Air Force dental officer Capt. Oliver Scow of the 502nd Tactical Control Group in Korea stated that the Chest-60 could essentially allow a dentist to operate in the field; however, setting up in fixed facilities such as school buildings made the dental environment much more inviting to the patient. “With a little initiative, common sense, and good luck, we were able to do all but complex dental cases.” His two room clinic provided not only oral surgery, but restorative, gold crown and bridge, and denture processing.

COMBAT DENTISTRY

VIETNAM

Military advisors from the United States had been in South Vietnam since the fall of the French in 1954, but it would not be until the early sixties that the Air Force began to provide in-country medical and dental support. The earliest dental facilities were established at Da Nang, Ton Sun Nhut, Nha Trang, and Bien Hoa in the 1962-63. Phan Rang and Cam Rahn Bay were built in 1965. No senior dental staff Air Force officer received official clearance in South Vietnam until 1966. Consequently, early recommendations as to the required dental support of the mission in South Vietnam had been done by non-dental personnel. Before 1965, the equipment and supplies provided to dentists in Vietnam was often outdated and inop-

erable. The ability of Air Force dentists to support the mission was often compromised in those early years.

By the end of 1966, more realistic manning criteria with recommended staffing and construction standards were being implemented in Southeast Asia. Air Force dental leaders in Washington honored their commitment to providing equitable worldwide dental support as evidenced by the ratio of dental personnel to troop levels in South Vietnam being very close to those anywhere else, including stateside.

A review of the annual histories within the Surgeon General's Office reveal that in 1966 the Dental Service under General Dunn made diligent efforts to support the combat mission in Vietnam. That year, the Dental Service began advocating all Air

Force inductees have a panoramic film as well as a Polaroid photo taken of the oral cavity, which assisted in dental identification. As for field equipment, air-driven operating dental units utilizing the high-speed handpiece were deployed for use in theater. Brig. Gen. Dunn wanted good equipment and facilities for dental personnel in Vietnam. The first designs of Air Transportable Hospitals were reviewed with dental input, including the modular concept of dental operatories.

That same year, 1966, researchers at SAM began developing a new "holding" filling material for use as a long term temporary restorative material useful in the emergency kits of the "Buddy Care System." Air Force Systems Command placed this project on high priority, and by 1967, the

USAF DENTAL OFFICERS KILLED IN VIETNAM

Major Raymond J. Dusold, Jr., was wounded in an ambush in late 1966 and died of his injuries nine months later in an Army hospital at Ft Bliss, Texas. An American Legion Post in El Paso, Texas, was dedicated on his behalf in 1968.

Lt. Col. Paul F. Keicker and Capt. James R. Jones assigned to Cam Rahn Bay AFB, were killed during a C-130 crash near An Khe, Republic of South Vietnam on June 17, 1967. The dental clinic at Seymour-Johnson, North Carolina, has been named in honor of Dr Keicker.

Their names along with other military dentists killed in Vietnam, are etched on a War Memorial plaque towards the entrance of the American Dental Association Headquarters in Chicago.

COMBAT DENTISTRY

new material called Polychromatic Intermediate Restorative Material (PIRM) was developed. Primarily a zinc oxide and eugenol mix with an inert polymer composite incorporated as a filler, the material was designed to wear for longer than 12 months.

Air Force dental personnel for several years had participated in People-to-People, Dental Med-Cap, and Civic Action humanitarian projects in Southeast Asia, including Thailand and the Philippines. These visitations to orphanages and the surrounding villages would become a major effort of Air Force dentists stationed in South Vietnam.

It is generally believed that the vast majority of dental Air Force officer and enlisted personnel participated on a volunteer basis; many did so on their off-duty days.

Civic Action Teams distributed toothbrushes and basic dental necessities, provided oral hygiene instruction, and performed many extractions. The conditions were hot, dirty, occasionally dangerous, and obviously very busy, as there were limitless numbers of people needing help. There were instances where dental personnel came under attack while on these humanitarian missions. These volunteers made a significant contribution to the American war effort in striving to win the hearts of our South Vietnamese allies. Several Dental Service veterans of Vietnam credited William M. Morlang for his exemplary contributions towards Med-Cap missions.



USAF Dental Operatory at Bien Hoa, South Vietnam, 1962-63

Capt. Morlang also enjoyed working with the pilots, being around the planes, as well as accompanying flight crews on selected missions. Air Force dentist, Capt. Donald R. Smidy, received the Air Medal as a result of numerous flights into hostile territory, providing dental care to Vietnamese orphanages.

Air Force dental specialists also offered their assistance with Vietnamese hospitals helping on difficult cases and worked with the limited number of Vietnamese dentists in upgrading their dental skills. South Vietnam actually had only one dental school located in Saigon, and in 1966, USAF Dental Officer William T. Byerly was asked to serve as a dental advisor. The coursework consisted of a five-year curriculum, and he acted as a liaison between that school and all of America's Armed Forces in country. There were only about a half dozen Vietnamese dentists in uniform.

Many dental officers routinely offered their assistance as surgical technicians in the hospitals during heavy influxes of casualties as well as during the evening hours when not seeing dental patients.

The number of dentists assigned in Vietnam ranged from 25 a year in 1966 to a high of 53 in 1969 and then back down to 33 in 1971. Again, the proper amount of staffing was a key in allowing adequate support of the Air Force's involvement in Vietnam. This allowed for preventive and routine dental care as well as expeditious emergency treatment, so vital to the our nation's air support of the war. Some Air Force dentists in Vietnam estimate about 40 percent of their patients were Army troops, as well as a number of Navy aviators.

Capt. Jerry D. Gardner, (eventually Brigadier General

The primary reason for lost duty other than combat injury in Vietnam was acute dental needs.

COMBAT DENTISTRY

THE GULF WAR

and Assistant to the Surgeon General for Dental Services), stationed at Cam Rahn Bay in 1967, felt Air Force personnel received the same dental care in Vietnam as they would have anywhere else. "The facilities were good, and we did not do just emergency treatment but provided lots of restorative work, including the full range of services that would have been provided in any large Air Force dental clinic anywhere in the world."

Brig. Gen. Gardner recalled participating on Med-Cap missions almost weekly. He also remembers the unfortunate incident of his roommate and fellow dentist, Capt. James R. Jones, being killed in a plane crash, along with Lt. Col. Paul F. Keicker, who at the time was Base Dental Supervisor at Cam Rahn Bay.

Just as in previous wars, approximately 10-15 percent of war related wounds were oral and maxillofacial. About 20 percent of emergency visits to the hospital were of dental origin with caries being the chief complaint followed by pericoronitis. Statistics vary, but a reasonable estimate is that between 140 and 170 dental emergencies will occur per 1000 troops in any deployment lasting longer than 90 days. Approximately 30-50 percent of these could be preventable. Evidence seems to indicate that dentists are needed both to get the troops in optimum oral health prior to deployment as well as to be accessible for dental care in the field.

Air Force Dental Service personnel deployed in support of Desert Shield/Storm included approximately 97 officers and 259 enlisted personnel. Some Air Force officers deployed during the early stages of Desert Shield in August of 1990, reported treating large numbers of Army troops until a sufficient number of Army dentists arrived. Others provided care not only to Army soldiers but foreign allied troops as well. Again, the Air Force did a good job of achieving an adequate dentist-to-troop ratio.

One observation during this particular war was that the dental components were the busiest of any of the health care practitioners. Most reported having plenty of work to do from the moment they arrived.

The Armed Forces had done a better job deploying soldiers in good or adequate oral health than in previous wars; however, there were still plenty of dental emergencies. There was also the unfor-

tunate reality that almost ten percent of the reservists activated were dentally unqualified for overseas duty. This has subsequently been addressed with Congress passing legislation to create a dental insurance program for the selected reserve.

Statistically, not a lot of change was reported in the literature regarding dental emergency visits between Vietnam and the Gulf. Approximately 17-20 percent of visits to the hospital were of dental origin. Caries was the chief dental complaint in Vietnam, followed by pericoronitis, while in the Gulf, wisdom tooth complaints and caries both contributed about equally to the percentage of dental emergencies.

Almost 35 percent of the enlisted dental component were assigned to decontamination teams, while if casualties had been high, the dental officers had been trained to assist with triage or as surgical assistants if requested. In theaters of combat, oral and maxillofacial surgeons are capable of treating trauma to the facial area as well as serving as anesthesiologists.



Air Force dentistry in an Air Transportable Hospital in the Gulf.

OPERATIONS OTHER THAN WAR

As one journalist visiting a MASH unit in Croatia in 1993 wrote, "Take a walk through the Army's field hospital and you may be surprised to find the busiest department is not the emergency room, intensive-care units, or surgical suites. It's the dentists' chairs."

The same has been witnessed of Air Force dentistry throughout the years as it supported hundreds of contingencies. Some dental operations have been close to hostilities; most have been in support of maintaining the peaceful presence of U. S. Armed Forces worldwide.

For almost forty years, Air Force dentists have shared their skills on goodwill missions with needy peoples in Central and South America, the Philippines, and Southeast Asia. Although these areas of the world have continually had dental team visitations, many other parts of the world have witnessed Air Force dental involvement. These short term activities have included Civic Action Teams, and humanitarian relief efforts. In more recent years when active duty or reserve units are on Medical Readiness Training Exercises (MEDRETE) in overseas locations, dental teams have offered their services to the local populaces in conjunction with their training. These MEDRETE teams are known as "people helping people," missions. Long-term deployment operations such as in the Gulf and Bosnia have increased this past decade. Dental officers can be deployed for up to six months. Approximately 30 Air Force dentists a year have been deployed on various contingencies in overseas locations in the late 1990s.



Air Force dentist, Lt. Col. Cedric C. Chenet, (far right) uses his Spanish speaking skills to interpret on behalf of the United Nations Medical Support Mission, "Task Force '86," and the Haitian government's health relief efforts to local villagers. The mayor of the provincial capital is to his immediate right and the Commander of the U.N. Forces is to the right of the mayor.



Two Air Force dentists with dental field equipment in Panama.

RESERVE COMPONENTS

The stories of the minuteman militia supporting the colonial armies and the colorful state regiments marching to battle during the Civil War give the impression that the Guard and Reserve forces are called upon only in times of crisis. Actually, throughout our 200 year history, they have been utilized more often than one would think, and during times of downsizing, are needed even more so to interface with the active components. The Mirror Force concept of the 1990s strives to achieve the necessary balance to complete the mission. Today's U.S. military cannot go far, stay long, or fight well without the Guard and Reserve forces. In fact, some functions of today's Air Force are 100 percent dependent on reserve components.

Legislation enacted on June 3, 1916 provided for the establishment of both a Dental Corps in the National Guard as well as the organization of a Dental Corps within the Army's Officer Reserve Corps.

Close to the end of the WWI in 1918, the Surgeon General's Report to the Secretary of War stated that 251 Guard dentists and 5,372 Reserve dentists had been recalled. Only two Guard dentists served as captains, the rest as first lieutenants. Almost

95 percent of the Reserve dentists were first lieutenants and about three dozen became majors, the highest rank attained. During WWII, 311 Guard dentists and 3,220 Army Reserve dentists were mobilized. Rank privileges improved, but lagged behind those of the medical officers.

Air units of the National Guard (ANG) were formally recognized in 1946 while the Air Force Reserve was created in 1948. The USAF Dental Reserve Components and ANG Dental Reserve Sections were officially created in 1949. Shortly thereafter, both Guard and Reserve personnel were mobilized for Korea. Unfortunately, the exact number of dentists recalled is unavailable. It is known, however, that some dentists were with their reserve units deployed to Korea. In July, 1951, the American Dental Association reported that over 3,000 reserve dentists had been recalled, of which 977 were Air Force.

Physicians, dentists, veterinarians, and biomedical corps personnel within the ANG were all compositely designated as medical officers. Therefore, the exact figures of ANG dentists mobilized for Korea will remain unknown; however, given the fact that 183,000 guardsmen, including their medical and dental personnel, were activated, a conservative estimate is

that dozens of ANG dentists were recalled.

The training of ANG dentists is flexible. Most often they train with the unit to which they are assigned performing the mission of the unit. However, ANG dentists can deploy individually or as dental teams in a manning assistance status, performing backfill for remote or short staffed Air Force installations, both CONUS and overseas. They have assisted many times in natural disaster relief efforts as well as numerous humanitarian contingencies to Central and South America. Organizational and command duties for Air Force Reserve Units comes from HQ AF Reserve at Robbins AFB, Georgia. During Vietnam, the USAF Medical Reserve reached an all-time high of over 10,000 personnel. In 1973, massive deactivation cut that figure in half. Of the previously existing 120 medical units, over 100 were deactivated. The shortage of medical and dental Reserve personnel had to be addressed. That same year, the Medical Mobilization Augmentee Program, working out of the Air Reserve Personnel Center in Denver, Colorado, was initiated. Today, they are referred to as Individual Mobilization Augmentees (IMAs).

In 1979, medical readiness became a top priority of the Air Force Surgeon General. The DoD

“The Dental Reserve supplied essential officers during the most critical period of mobilization for war, before the Selective Service System was in effective operation.”

A History of the U.S. Army Dental Service in World War II

RESERVE COMPONENTS

Inspector General's audit revealed the Air Force Reserve medical manpower staffing could not prepare for wartime taskings. Recruitment and retention rates increased, but it took time. Not until the late 1980s was the desired number of Reserve health professionals, including dentists, achieved. For 20 years, all Reserve and Guard health personnel have received increased training for wartime scenarios. The Total Force concept adopted by the Air Force in the 1970s has created a greater interface and dependency on Reserve Components. For 25 years the Total Force strategy was defensive, that is, structured to fight a global war and therefore discourage superpower confrontation. With the demise of the Soviet threat, the nation sought to return to the militia concept that served our nation well up until WWII. The downsizing of the 1990s sought to find a proper mix of active duty, Reserve, and Guard forces to deal with potential regional conflicts throughout the world.

This greater dependence on trained and prepared forces requires "right-sizing," and it does save money. Today, 20 percent of the Air Force's total combat capability is provided by Reserve units but only costs 4 percent of the Air Force budget. This "Mirror Force" whole team concept of the 90s seeks to have a seamless, highly prepared force. The bottom line is that Armed Forces do indeed cost money, and although the American public has witnessed a shrinking military that has saved money, they also expect those in uniform to protect them. At some point, however, caution should be exercised, as budget cuts could undermine preparedness.

There have been five major mobilizations of reserve forces, the largest being for Korea. Desert Shield/Storm required the second largest recall, even more so than Vietnam. A total of 77 AF IMA and unit Reserve dentists were mobilized for the Gulf War, as well as several dozen ANG dentists. Most, if not all dental RC served within CONUS.

Almost 10 percent of all Reservists activated for Desert Shield/Storm were dentally unqualified for overseas duty. This clearly was a problem that needed to be addressed. In 1997, DoD implemented a low-cost dental insurance plan for reservists. Air Force Reserve dental officers assisted in developing a computerized tracking system called the Reserve Data System, formatted to monitor the dental readiness classification of Air Force Reservists. It was specifically designed to prevent any reduction in combat efficiency of a military unit due to dental reasons.

Before 1990, Reserve units and IMA personnel were involved in a dozen operations, but since the Gulf War, they have participated in more than 40 contingencies. Because of greater dependency on Reserve forces, a new major command was created, the ninth within the Air Force structure. The Air Force Reserve Command was activated in 1997 with Maj. Gen. Robert A. McIntosh as the first commander. There are presently about 72,000 Air Force reservists of which 12,000 are medical and dental health professionals. There currently are about 85 IMA AF dentists, 170 ANG dentists, and 125 AF dentists attached to Reserve units.

"When we deploy for an exercise or for one of the many recent contingencies, it is hard to tell which people or units are Reservists, and which are on active duty.....the seamless daily operation enjoyed today serves us well."

*Maj. Gen. Robert A.
McIntosh, USAF*

RESERVE COMPONENTS



Brig. Gen. Robert V. Clements



Brig. Gen. Wayne W. Barkmeier



Brig. Gen. Joe P. Santaniello

There have been a half dozen Air Force dentists in the Reserves who have attained the rank of brigadier general. These positions are extremely difficult to acquire in that the USAF Surgeon General has to recommend an individual to Senior Chief of Staff Officers. The first was the distinguished James P. Hollers in the mid-1950s, who was one of the original cadre of Air Force Reserve dental officers. He had strong working relationships with both Maj. Gen. George Kennebeck and Maj. Gen. Marvin Kennebeck. His participation in military and dental political activities are of legendary proportions in San Antonio.

The first person to attain brigadier general status as the Mobilization Assistant for USAF Reserves within the Surgeon General's Office was Robert V. Clements in the early 1980s, when medical readiness and increased reserve participation was needed. He had been a unit reservist for many years prior to becoming an IMA Dental Reservist.



Brig. Gen. Edward H. Greene

IMA Dental Reservist, Wayne W. Barkmeier, served as the Mobilization Assistant, SGD, during the Gulf War through the mid-1990s. He is currently Dean of the Creighton University School of Dentistry in Omaha, Nebraska, where he has taught a number of years as a clinical research professor of biomaterials. He was succeeded in the same position by IMA Dental Reservist, Joe P. Santaniello, who also was selected to brigadier general, and very active in Reserve readiness. General Santaniello provided leadership in helping nurture the Mirror Force strategy of a medically ready, seamless Total Force of the active and Reserve components. This required identifying issues, planning appropriate actions, and initiating change.

In 1998, R. Carl Szarlan was selected as the ANG Assistant to the Office of Assistant Secretary of Defense for Health Affairs. He was the first ANG dentist to attain the brigadier general rank.

Edward H. Greene, a private practice dentist in Lincoln, Nebraska, was a line officer for many years as a pilot with the Air National Guard. He transferred to the medical side in 1993 and shortly thereafter served as a Medical Squadron Commander. The high accolades for his management of an outstanding unit helped him in being selected to brigadier general status as a Chief of Staff of the Nebraska Air National Guard Unit.

RESERVE COMPONENTS

Brig. Gen. James P. Hollers: A Tribute to a very active Reserve Dentist

To many Texas dental practitioners the name James P. Hollers is one of those “bigger than life” images. It would be difficult to find anyone who served the uniform and the profession more diligently. His accomplishments are deserving of recognition and remembrance.

A Texan by birth, he enlisted in the U.S. Army immediately upon high school graduation in Big Wells, Texas, in 1917. During World War I, he participated in five major campaigns in Europe, and won a Purple Heart. He returned after the war to pursue a dental career. Graduating from Tulane University in 1924, he entered private practice in Louisiana and joined the Army Dental Corps Reserve in 1925.

In 1929, he opened a new practice in San Antonio where his life would have a tremendous influence in the civic, military, and dental arenas. Throughout his life, he served as president of dozens of organizations, many very promi-

nent. Shortly before World War II, he had served as President of the San Antonio School District Board of Trustees, as well as President of the Reserve Officer’s Association of the United States.

Entering active duty, he served within the Army Air Force’s Dental Corps as Base Dental Surgeon at several facilities. At the close of the war, Col. Hollers resumed private practice, but remained with the Army Air Force Dental Reserves becoming one of the first group of Air Force dental reservists in 1949. His active duty and reserve assignments included being a member of the Legislative Liaison Division of the Dental Air Staff, as well as Assistant Chief Dental Division of SGO, Air Force. Col. Hollers was promoted to Brigadier General in the early 1950s. He remained very active in civic and professional organizations, and soon his colleagues were

saying, “If you want a job done, holler for Hollers.”

Other positions to follow included President of San Antonio Chamber of Commerce in 1957, President of Texas Dental Association in 1960, President of the American Academy of Periodontology in 1961, and President of the American Dental Association in 1963.

General Hollers was highly influential in helping keep the School of Aerospace Medicine in the San Antonio area when it relocated from Randolph AFB to Brooks AFB. During the 1970s, his stature was extremely helpful in bringing the University of Texas Dental Branch to the South Texas Medical Center in San Antonio. The scope of his achievements is impressive.

*“If you want a job done,
holler for Hollers.”*

*Texas Dental Journal,
November 1951*

The USAF Dental Corps interfaces with civilians within the Department of Defense as well as the American Dental Association. Dr. James P. Hollers (far right), dental representative of the Armed Forces Medical Policy Council, visits Wiesbaden Dental Clinic in West Germany, 1953. Lt. Col. Benjamin W. Dunn is second from left, and Col Walter J. Reuter is far left.



AEROMEDICAL DENTISTRY

Keeping airplanes and crewmen ready to fly is the overall mission of the Air Force, and the dental contribution towards this goal must not be overlooked. Since the early part of WWII when aerodontalgia gained recognition as a diagnostic entity, dentistry's support role to the flying mission has remained essential. Pressurized aircraft and pilot suits have contributed much to decreasing the number of cases of what is often now

referred to as barodontalgia; however, preventive dental measures still deserve the lion's share of the credit.

Any aborted flight is one too many, and the Dental Service works in close cooperation with the Flight Surgeon's Office to prevent medical-dental complications from jeopardizing the flying mission. Each Air Force dental clinic has a designated dental officer in charge of monitoring the dental readiness of flying

personnel. Titles such as aeromedical dental officer or aerospace dentist are often used.

Guidance for the management of flyers' dental needs is provided by standard regulations from Washington and directions from the Flight Surgeon's Office at each base. Air Force dentists have diligently tried to prevent any dental mishaps from occurring during flight; however, throughout the years, there has been the unfortunate occasional aborted flight due to dental reasons. In large



The Air Force's F-4 was a common sight over the skies of Vietnam.

“When pilots are stressed to the maximum, like pulling excessive G forces to evade enemy SAM missiles, they understandably tend to clench heavily. The result was lots of fractured teeth and restorations. We, as Air Force dentists, did a great job of keeping those pilots ready to fly by treating them expeditiously. Because of our support of the mission, I think very few man-hours were actually lost by flight crewmen due to dental reasons.”

*Col. John M. Young, (Ret), USAF Prosthodontist in Vietnam,
who currently serves as a Dental Consultant to NASA.*

AEROMEDICAL DENTISTRY

measure, the Dental Service has done quite well in monitoring flight personnel.

Dentistry also interfaces with the training of flight surgeon residents at the Aerospace Medicine division of Brooks, AFB, Texas. They are exposed to aircraft accident and mass disaster management, forensic sciences, and forensic photography. The dental curriculum has been coordinated by Col. William M. Morlang since the 1980s. He retired in 1996, but has continued

with his teaching responsibilities and provides dental input for AeromedicalSpace activities at Brooks AFB.

“It is of note that the dental officer plays an integral part on the aerospace medical team, and that the program provides for good liaison between the flight surgeon and the dental officer to handle problems of a dental nature that have aeromedical ramifications.”

*USAF Medical Service Digest,
June, 1964.*

REFLECTIONS

A LOVE OF DENTISTRY AND AIRPLANES

COL. WILLIAM M. MORLANG II

(See photo in Forensic Dentistry)

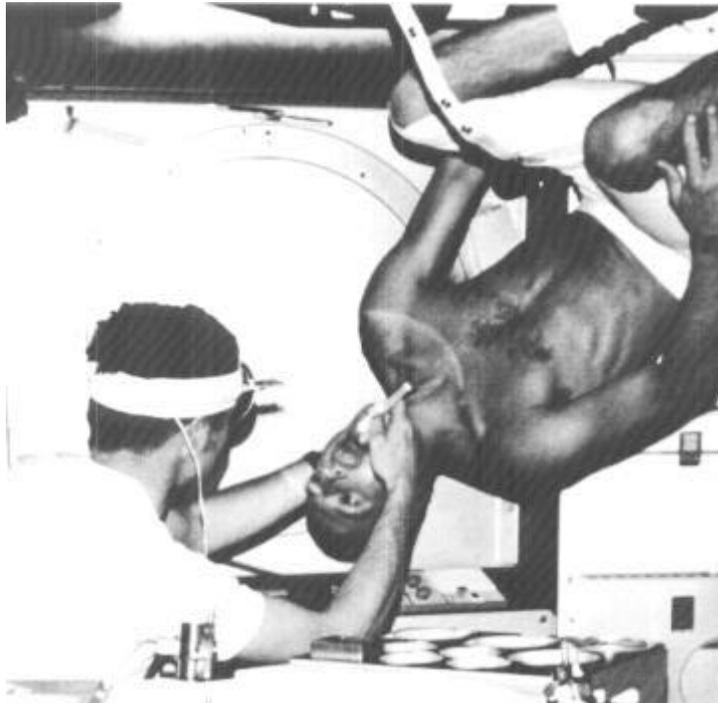
There have been dentists throughout the years that have taken a special interest in taking care of the flyers. Duty titles such as Aerospace Medicine Dentist or Aeromedical Dental Officer have been around for some time. My first tour was in 1966 at Myrtle Beach where I had the opportunity of being assigned to the hospital dental clinic maintaining the oral health of the pilots. Following that assignment, at my request, I was sent to Vietnam. I was young, single, and in uniform, so I felt that's where I needed to be. The opportunities to be of service to others were abundant during my tour there. Coordinating the Medical Civic Action Program around Saigon was a real blessing. The physicians were quite busy, so I was glad to volunteer my time to the project. I believe it was a good program, not only because of meeting the health needs of the orphans and villagers in the vicinity of Saigon, but also in winning the hearts of the South Vietnamese people. In the evenings, the dental officers often helped as surgical assistants when casualties necessitated.

One of my fondest memories was getting to fly. Making sure the pilots are in optimum oral health is one of our primary missions in the Dental Corps, especially in a war zone. I had good rapport with many of the pilots and was fortunate to have spent a number of hours with them in the cockpit. A number of dentists, such as myself, enjoyed being around planes, and I enjoyed doing dentistry in the Air Force environment. One other recollection about my Air Force experience is that dentistry has consistently been underrated as a health care need during military contingencies throughout the world.

FOOTNOTE:

Col. Morlang retired in 1996 with a legacy of contributions to the arena of forensic dentistry. Part of his duties in Vietnam included the identification of deceased servicemen, and he has since built on those experiences. He continued training in forensic dentistry throughout the 1970's, acquiring his board certification in forensic odontology in the early 1980s. He was called upon to assist in management of over a dozen of our nation's mass disaster casualty mishaps. He served as Consultant to USAF Surgeon General in Forensic Dentistry from 1979-1993. He has also served as Forensic Dental Consultant both to the Armed Forces Institute of Pathology and to the Armed Forces Medical Examiner. In 1996, he was President of the American Society of Forensic Odontology. His dedication to Air Force dentistry is commendable. (See photo in "Forensic Dentistry").

AEROSPACE DENTISTRY



Oral examination performed on Skylab, 1974.

The Air Force had the welcome opportunity of providing support for the nation's exploration of space. The USAF Dental Service was tasked with providing optimum dental care to the space pilots, as well as finding a way to provide emergency dental care during prolonged space flight.

Not much had changed since the early days of aviation dentistry: prevention was still the best cure. An optimum standard of oral health would obviously be required of the astronauts. Original guidelines for the relation of dentistry to aerospace medicine were issued in 1957 by the Surgeon General's Office in AFM 160-13. It was well written and comprehensive. A report in the mid-1960s from USAF School of Aerospace Medicine, Brooks AFB,

Texas, entitled "Astrostomatology" outlined standards for the examination and possible disqualification in the selection of space crewmen depending on their oral health.

The astronautical training program at Edwards AFB, Calif., received close dental supervision. When the National Aeronautics and Space Administration (NASA) manned Space Flight Program began operating out of Houston in the early 1960s, most of the astronauts were military and received dental care at nearby Ellington AFB. Specialists at Lackland AFB provided consultation and some clinical care when necessary. For example, in 1962, a chipped tooth necessitated a quick visit to Lackland by Lt. Col. John Glenn shortly before his historic space flight orbiting the earth.

Beginning in 1966, the Air Force assigned dental officer William F. Frome full time to NASA at Houston who also worked with Wilford Hall dental specialists as needed. He remained with NASA through the



Col. William F. Frome

AEROSPACE DENTISTRY

Skylab program of the 1970s and the Shuttle missions of the 1980s.

The short missions of Mercury required no dental provisions. However, during Gemini, a toothbrush accompanied the astronauts. By the time of the Apollo flights, floss and toothpaste became a part of the in-flight dental kit.

In 1968 Ira L. Shannon at the School of Aerospace Medicine, Brooks AFB, Texas, developed a foamless ingestible dentifrice called "Nasadent." This was necessary to prevent the need to expectorate and possible dispersal of saliva and debris in the weightless environment of a space capsule. Regular toothpastes with detergents foam excessively in zero gravity conditions, and this particular dentifrice prevented that. Other studies at SAM dealt with finding an intermediate restorative material for potential use on manned missions.



William Frome instructs astronaut Jim McDivitt on use of the in-flight dental kit prior to one of the early Apollo missions. McDivitt would soon be placed in charge of the Apollo program, eventually retiring as a general.

"A position for an Air Force dental officer has been created at Manned Space Flight Center, Houston, TX, in an attempt to prevent possible space mission aborts of dental etiology."

USAF Medical Services Digest, Sept, 1966



USAF dentist Col. William F. Frome experiencing weightlessness in NASA training.

AEROSPACE DENTISTRY

REFLECTIONS

**“AIR FORCE DENTISTRY
WAS VERY PROGRESSIVE”
LT. COL. JACK. L. HARTLEY**

I entered the Air Force in 1951, and one of my earliest assignments was at the National Bureau of Standards, and it was a wonderful work experience. It was an exciting time for the profession as we were working on all kinds of technological improvements that could revolutionize dentistry. One of my earliest projects as a participant was with Don Hudson on the development of the Panorex. In 1955, I was transferred to SAM and did a considerable amount of research on such things as the effect of diamond versus carbide burs on tooth structure at high speeds which the newer dental handpieces were generating. Towards the sixties, I enjoyed the challenge of developing a dental kit to accompany the astronauts in space. It was an exciting time for the dental profession as well as for our nation's space program, and Air Force dentistry was very much a part of the progress.

FOOTNOTE:

After retiring from the Air Force, Dr. Hartley taught in the Diagnostic and Radiology Section at the University of Texas Dental School at San Antonio. One of his fondest memories of research relates back to the panorex. One of the Lackland inductees was discovered to have a mandibular lesion that would have been missed without the use of the Panorex. The patient was successfully treated; however, if the lesion had been missed, more money would have been spent rehabilitating this one patient than all the money the Air Force initially allocated for the Panorex development.

EMERGENCY DENTAL KIT FOR SPACE MISSIONS

The Dental Service was tasked to explore how to handle an unforeseen dental emergency in space. Although the probability was remote, it was an area the Dental Service needed to research. In the zero-gravity, confined environment of a space capsule, the possibility of accidental trauma to the oral cavity existed, such as the chipping of a front tooth. Of real concern was the occasional barodontalgia and its possible repercussions in space.

Lt. Col. Jack Hartley at SAM in 1966, issued a report titled, “An Emergency Dental Kit Encasement for Use on Extraterrestrial Missions.” The research involved determining which dental instruments and materials, as well as drugs, might be required in a “buddy” dental care emergency. The kit would need to be lightweight, durable, compact, non-toxic, and operable in weightless conditions. The kit was eventually constructed of a high-impact styrene hard shell. Nopof foam served as a core material. Because the material could be form-fitted, instruments to be imbedded with enough resistance to prevent falling out of the kit in a weightless environment. The kit weighed only 34.5 oz. and the dimensions were roughly 12"x 6"x 2". It contained a forceps #1, forceps #2, mirror, probes, hypodermic with five cartridges, a cartridge containing a paste of premixed zinc oxide and eugenol for use as a sedative, temporary restorative material, a corticosteroid paste to treat gingival

abrasions, gauze, and a flashlight. (See photo on page 5.)

Air Force dental officers William Roach and William Baker at Wilford Hall taught the astronauts basic dental procedure such as placement of temporary restorations and simple extractions. The training was comprehensive enough to include direct chairside

In 1966, Air Force dental researchers at Brooks AFB issued a report titled, “An Emergency Dental Kit Encasement for Use on Extraterrestrial Missions.”

patient experience for the astronauts. Although the dental kit had been developed to support the Apollo missions, in reality, it would not be until Skylab in the early 1970s that the kit actually accompanied space flight. By that time, it had been modified several times.



Lt. Col. Jack Hartley

AEROSPACE DENTISTRY

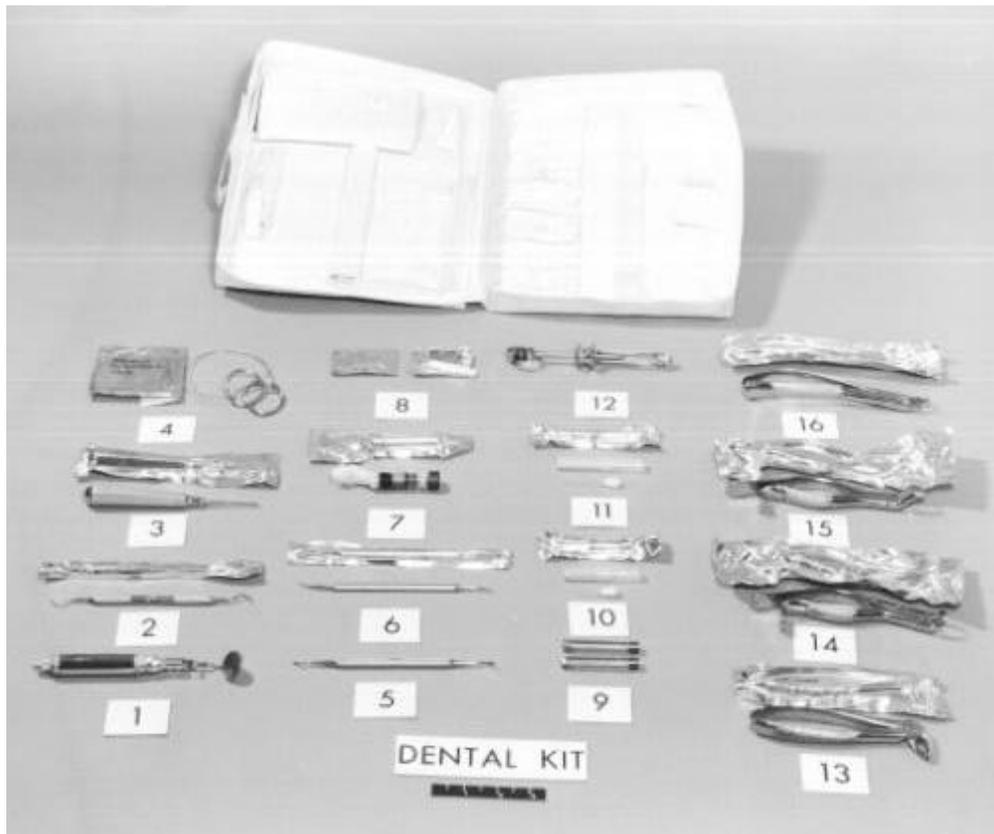
To date, the dental kit has never been utilized, again, testimony that prevention is the best cure. It is interesting to note that the Russians did not plan as efficiently as NASA concerning dental ills during space flight. Cosmonaut Yuriy Romanenko suffered great pain for two weeks during the space flight of Salyut 6 in 1978. No provisions for dental pain were available.

Another interesting footnote to the dental kit is reminiscent of the Apollo 13 mission, when all available materials within the capsule were utilized to solve unforeseen problems. On one of the Skylab missions, after exiting the

earth's atmosphere, one of the solar panels was damaged and the framework would have to be repaired outside the space capsule for it to work properly. To correct the situation, the metal panel might possibly have needed to be cut in order to bend and reposition it. Houston Control Center informed the astronauts of several options, one of which was to utilize the gigli saw within the dental kit. It is a small, efficient medical tool for cutting through dense bone and had been placed in the emergency dental kit to saw through a fixed prosthodontic appliance in order to remove only the damaged part of an existing bridge. However, the astronauts who exited the capsule were able to remove the

panel before resorting to the gigli saw.

Learning how to deal with potential dental problems in space remains a concern to NASA. Retired USAF dentist John M. Young now serves as Medical Operations Consultant to NASA developing dental instruments and guidelines for preventive and emergency procedures in a zero gravity environment. Control of infectious aerosols and air-borne particulates within the confines of a space capsule can be very challenging, but can now be done thanks to his research.



Dental space kit that accompanied prolonged space flights such as Skylab. Note the gigli saw at top left of photo, item #4.

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