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# It's Superman!

remember waiting patiently (or more likely impatiently) for my weekly dose of Superman when I was a child. "It's a bird! It's a plane! It's Superman!" Those opening words always excited me. He was my hero. My fascination might have been his X-ray vision, his super strength, or his ability to fly. Perhaps it was his disguise as the mildmannered reporter Clark Kent with that hat or the predictable change to the man-ofsteel in a storage room at the Daily Planet. (Despite the hype I cannot recall him ever once using a telephone booth.) But what appealed to me on a deeper level was that he always championed the underdog, got the bad guys, and did it because he could and it was just, not for any reward.

There is no way to chronicle the heartbreak I suffered when I learned he was not real, and that neither I, nor anyone else, would ever have superpowers. Reality is sometimes a difficult thing to swallow. But as we grow and mature it becomes obvious we have to work with the powers, strengths, and skills that are innate or that we can develop to help others.

History has shown there are events that far exceed the belief that we might have in our invincibility. With the overwhelming destruction Mother Nature wreaked upon the Gulf states in the form of the recent hurricanes, we have been inundated with disasters that have challenged the heartiest among us. It would have been miraculous to have Superman to offset the "bad guys" or save the world, but he is fictional and was not there to do the things that needed to be done.

We do have within our ranks a number of individuals who have gone beyond just caring or being empathetic in response to the recent hurricane disasters in the Gulf states, not exactly superheroes but mortals who did what they did because it was the right thing to do. There exists a cadre of individuals who have trained in the skills and services that are afforded in these circumstances by forensic dentists. These are people who have taken time off from their practices, the comforts of home and family, and their busy lives to help others in what has to be a most dishearten-

There were a number of dental health personnel from California who served on the forensic den-

tistry team sent to the New Orleans area. They were able to process many of the dead, to help with identifying and cataloging their remains. One positive aspect of this effort was that state-of-the-art equipment was used to efficiently and effectively to do so. Ultimately, these records can be crosschecked with whatever ante mortem data that can be reconstructed to provide names of the deceased. The living conditions including rain, intense heat and humidity, odor, insects, snakes and spiders, and lack of adequate showers and dormitory facilities at the outset made for a less-thanstellar environment. Despite this, the teams worked hard, wearing confining protective suits, and accomplishing much to help in

We owe a debt of gratitude to Drs. Susan Bollinger, Stephen Lojeski, Anne Spiegel, Elverne Tonn, and James Wood for the work they have done. These individuals answered the call for help and went with-



We do have within our ranks a number of individuals ... who did what they did because it was the right thing to do.

# The ultimate form of charity, it has been said, is giving when the recipient has no idea who is the donor.

out hesitation to do what they had been trained to do. They accomplished much and helped so many families who likely do not even know who they were.

The ultimate form of charity, it has been said, is giving when the recipient has no idea who is the donor. This group has shown compassion and dedication to doing the right thing under difficult circumstances. The American Dental Association, represented by President Dr. Robert Brandjord; the California Legislature, through Assemblyman Bill Emmerson; and the California Dental Association, honored these individuals with an award at our own House of Delegates in November.

I have long since accepted the fact that superheroes do not exist. But I am happy I do not have to give up the thought that we have many caring individuals who put the welfare of others and the greater good above their own needs. There is little recognition or reward for the things they do other than the self-satisfaction of knowing they are doing a good thing.

We cannot recognize them other than in a ceremonial way. But on behalf of those of us who appreciate their values, and the thousands of our fellow human beings, both dead and alive, who they helped, we are grateful for their efforts. The victims of the hurricanes and their families owe you a great deal of gratitude — as do those of us who did nothing at all. Dentistry appreciates what you have done. The California Dental Association is proud to have you as participants from our state. Thank you for doing the right thing. These individuals did it to get to truth, to provide justice to grieving families, and in the American way. Good work, people.

# In Support of the Association

Dear Mr. DuBois:

Thank you very much for the luncheon invitation allowing me to share my recent experiences as the command dental surgeon for the Iraqi Theater of Operations with the Executive Committee of the California Dental Association.

Your very kind invitation for me to attend the semi-annual Scientific Session in San Francisco was very unexpected and much appreciated. To be honest with you, I accepted your invitation with some trepidation not knowing exactly what to expect from the Executive Committee from a nonmember of the association (overwhelming feelings of dread of being told to see the principal at Lowell High School are a close approximation). I was prepared to be greeted politely but coldly by the members of the committee. Instead of a bunch of stuffed shirts who were full of themselves. I was very pleasantly surprised how genuine the committee members were and how very warmly I was received. You and the members of the Executive Committee certainly changed my preconceived concepts of organized dentistry and the doctors who are members of the California Dental Association.

There are many citizen-soldiers currently on active duty with the armed forces of the United States in southwest Asia with experiences that are as interesting, or even more interesting, as mine. It just so happened I had the unique opportunity and resources to win the hearts and minds of the Iraqi medical-dental community by restoring the operations of the University of Baghdad College of Dentistry and Medicine with the purchase of thousands of dollars' worth of medical and dental equipment, student furniture, computers, and expand-

able supplies. With the assistance of the University of California School of Dentistry, the University of the Pacific Arthur A. Dugoni School of Dentistry, and members of the San Francisco Dental Society, more than 4,000 pounds of surplus dental and medical textbooks were flown from Travis Air Force Base to the University of Baghdad last April. Furthermore, when I was ordered to assist the Iraqi dentists in the formation of a dental society in Iraq, I specifically used the model of the California Dental Association leadership system, even though I am not currently a member, as a valid model when I briefed the Iraqi minister of health, the minister of higher education and the dean and faculty of the University of Baghdad College of Dentistry.

We are ordinary citizens, placed into a unique situation and asked to do very extraordinary things, often under very austere and dangerous conditions. We all share a common bond of devotion to duty and a love for, and selfless service to, our country.

Again, thank you very much for your invitation to lunch. My CDA membership application will be forwarded to the local component in the next few weeks, along with a check that comes out of my own pocket and not the local government health department.

Your unqualified support for deployed reservists, even nonmembers such as myself, and your demonstrated interest in my dental activities in Iraq, has changed my feeling about "organized" dentistry, the California Dental Association, and has convinced me that it is high time for me to begin supporting the association!

Cordially,

Franklin Woo, DDS Chief of Dental Services You and the members of the Executive Committee certainly changed my preconceived concepts of organized dentistry and the doctors who are members of the California Dental Association.



# **Exploring the Connection** Between Oral Health and Overall Health

s research continues to uncover links between medical health and oral health, is it possible that dentists may become more active in their patients' overall health care?

Last summer, the American Dental Association Board of Trustees learned about the developments that could facilitate detection of disease in the dental practice as well as the science behind oralsystemic relationships. There also was discussion of how dentists can be responsive to scientific evidence and their patient's well-being.

The overreaching question, posed Daniel M. Meyer, DDS, ADA associate executive director of the Division of

"What is our role as health care providers as knowledge of oral-systemic relationships evolves and becomes more clearly defined?" DANIEL M. MEYER, DDS

Science, is "What is our role as health care providers as knowledge of oral-systemic relationships evolves and becomes more clearly defined?"

Timothy DeRouen, PhD, executive associate dean for academic affairs and research at the University of Washington-Health Sciences School of Dentistry, examined past studies showing associations between oral conditions and medical conditions, especially periodontitis. Though numerous studies showed associations between a variety of systemic diseases and periodontitis, the studies don't present a clear consensus on casual versus causal relationships or statistical versus clinical significance.

The most dramatic association, DeRouen emphasized, is smoking as a risk factor for periodontal disease and many medical conditions.

"Maybe the best thing a dentist can do is to convince patients that smoking has many health risk factors and get them motivated to quit," DeRouen said.

Providing a summary of research connecting medical and oral disease — particularly difficult pregnancies and heart disease — was James Beck, PhD, professor of dental ecology at the University of North Carolina School of Dentistry.

"Treating periodontitis may be a costeffective strategy for insurance companies, but researchers need to continue to study and develop more sophisticated testing, and the health professions, the public, and state and federal officials need more education about the relationships and what they really mean."

Daniel M. Malamud, PhD, professor of biochemistry at the University of Pennsylvania School of Dental Medicine, along with other researchers, are working on methods to screen for and diagnose cancer, diabetes, and infectious diseases using saliva. "Everything in blood is also in saliva," he said. "And researchers are working

on the challenges to develop oral tests."

Treating oral disease can affect systemic conditions and treatment of systemic conditions can affect oral health, said Michael Glick, DMD, professor and chairman of the department of diagnostic sciences at the University of Medicine & Dentistry of New Jersey, New Jersey Dental School. But as scientific evidence continues to emerge, health care providers — and dentists — need to take on the responsibility for a patient's medical health as boundaries between medicine and dentistry are frequently redefined.

"For example, just taking blood pressure is an opportunity, a noninvasive way, for dentists to dramatically affect a patient's health," said Glick, who also is editor of The Journal of the American Dental Association. "Should dentists be in the business of checking blood pressure? According to the 'Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure,' all health professionals should be active in hypertension prevention and management. And dentists can also have a role in trying to promote behavioral changes in patients that can improve overall health."

John F. Schneider, MD, PhD, chair designate of the American Medical Association Council on Scientific Affairs, welcomed dialogue between physicians and dentists that would ultimately result in better overall health for patients.

"What is needed from the next generation of reproducible scientific studies is greater clarification on cause and effect relationships," said Meyer at the end of the forum, "and how specific oral health interventions affect general health."

The ADA Board directed the development of a position statement for the profession and the media on the current state of knowledge on oral-systemic relationships.

# **Commission Created to** Work on Supporting and **Bolstering Medicaid**

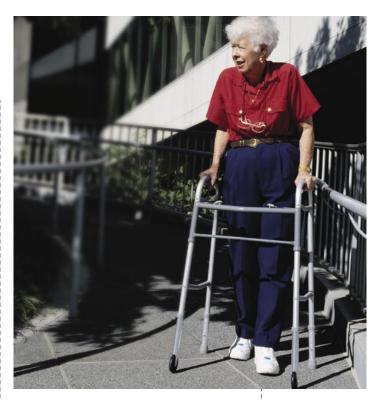
Health and Human Services Secretary Mike Leavitt today established an advisory commission that will help identify the reforms necessary to stabilize and strengthen Medicaid so it can continue to serve the nation's most vulnerable citizens.

"For generations, Medicaid has served the health care needs of the truly needy in America, but today the program is no longer meeting its potential," said Leavitt. "It is rigidly inflexible and inefficient, and worst of all, it is not financially sustainable. I look forward to working with this commission in an open and bipartisan manner to reform and modernize Medicaid. The time to reform Medicaid is now, and this commission will help the administration, Congress, and the states create a plan to ensure Medicaid can meet its goal of providing quality health care in a financially sustainable way."

The Medicaid commission must submit two reports to Leavitt. The first outlines recommendations for Medicaid to achieve \$10 billion in savings during the next five years, as well as ways to start significant long-term enhancements that better serves beneficiaries. The commission, for its first report, also will consider potential performance goals for Medicaid.

The second report provides recommendations to ensure the long-term sustainability of Medicaid. The proposals will address key issues such as:

- How to expand coverage to more Americans while still being fiscally responsible;
- Ways to provide long-term care to those who need it:
- A review of eligibility, benefits design, and delivery; and
- Improved quality of care, choice, and beneficiary satisfaction.



The second report also considers how to address the major issues affecting Medicaid under three different scenarios: an assumption that federal and state spending continues at current paces, an assumption that Congress chooses to lower the rate of growth in the program, and an assumption that Congress may increase spending for coverage. The report will assume the basic federal-state match for Medicaid will continue.

Leavitt is expected to appoint up to 15 voting members to the commission, including at least three representatives of public policy organizations involved in health care policy for families, individuals with disabilities, individuals with limited incomes, and the elderly. The commission also may have former or current governors, former or current state Medicaid directors, and other individuals with expertise in health, administration or finance. In addition to the voting members, the commission will have up to 23 nonvoting members including advisers with interest or specific health care expertise in Medicaid, and as many as eight policy experts designated by several Congressional leaders.

"It is rigidly inflexible and inefficient, and worst of all, it is not financially sustainable.

MIKE LEAVITT, HEALTH AND HUMAN SERVICES SECRETARY

"THERE IS STILL GREAT NEED FOR ASSISTANCE, AND WE ENCOURAGE CONTRIBUTIONS TO THE ADA DISASTER RESPONSE FUND."

ARTHUR A. DUGONI, DDS

# **Additional Support Sought** for Hurricane Victims

The American Dental Association Foundation has distributed more than \$1.3 million in grants from its disaster response fund to dentists affected by Hurricanes Katrina and Rita, and is seeking more support.

"There is still great need for assistance, and we encourage contributions to the ADA Disaster Response Fund," said Arthur A. Dugoni, DDS, ADAF president.

The grants were issued to dentists who



sustained major damage to their practice, homes or both. The grants, up to \$2,500, help the affected dentists with immediate emergency needs such as shelter, food, and clothing. Dugoni, dean of the University of the Pacific dental school that bears his name, said the board has extended its deadline to apply for grants to Feb. 28. Grants also are available to nonprofit or publicly funded groups to provide dental services to affected areas.

For more information about the disaster grants, visit http://www.ada.org/ ada/prod/adaf/proq\_charitable\_disaster.asp#grants. To download a donation form, go to http://www.ada.org/goto/hurricane and return via fax to (312) 440-3526, or mail to the ADA Foundation, Disaster Response Fund, 211 E. Chicago Ave., Chicago, Ill., 60611. Donations also may be phoned in with a credit card to (800) 621-8099.

Since 1991, the ADA Foundation has disbursed an estimated \$27 million to support charitable activities. In addition to providing grants for dental education, research, access to care and scholarships, the foundation supports charitable assistance programs ranging from relief grants to dentists and their dependents who are unable to support themselves because of an injury, medical condition or advanced age, as well as those who are victims of disasters.

# Stay up to Date on Drug Trends

With an estimated 12 percent of the American population 65 years of age or older and a good portion of them living with some type of chronic disease, dentists are discovering they must constantly keep up with the latest drugs, their uses and side effects, and possible drug interactions.

In a recent issue of Northwest Dentistry, James Little, DMD, MS, said it is not uncommon to find dental patients taking up to 10 drugs. The most commonly prescribed are antibiotics. The website, www.rxlist.com, provides the top 200 most prescribed drugs. The top 10 are:

- Hydrocodone/APAP (generic) Pain relief
- Atorvastatin (Lipitor) Elevated cholesterol
- Levothyroxine (Synthroid) Hypothyroidism
- Atenolol (generic) High-blood pressure, chest pain, and may be prescribed following a heart attack
- Azithromycin (Zithromax) Various bacterial infections such as pneumonia or other respiratory conditions
- Amoxicillin (generic) Bacterial infections of the chest, throat, and ears. Also can be prescribed for certain patients to prevent infection of the heart.
- Furosemide (generic) Edema, including pulmonary edema, highblood pressure, heart failure and kidney failure patients
- Hydrochlorothiazide (generic) High-blood pressure, and edema of the hands and feet
- Amlodipine (Norvasc) High-blood pressure, and sometimes prescribed for chest pain
- Lisinopril (generic) High-blood pressure, heart failure, and to protect the kidneys of diabetic patients

# **Network Links Job Seekers** and Academia

For those looking for a position in academic dentistry or institutions wanting to fill a vacant dental school spot, the American Dental Education Association's Academic Dental Careers Network has a free-of-charge database.

The online network, www.adea.org/ aden, pairs individuals seeking dental and allied dental faculty positions with those academic dental institutions searching to fill the vacancies.

To include a CV for consideration or to search vacancy listings, one must first create a personal profile and a username/ password. There are instructions to post a resume or search for open positions. Those eligible for the faculty loan repayment program should include that on their profile. Job seekers also can access a number of resources on academic careers in dental education, including ADEA's video "Academic Careers in Dentistry."

Institutions using the site can register and post ads. The ADEA creates a provider username/password enabling them



to search CVs, post vacancy announcements, and submit announcements to the ADEA's Journal of Dental Education and/or the Bulletin of Dental Education.

Only those at academic dental institutions with responsibility for hiring can access this information and view hundreds of posted CVs.

In the nearly two years since its release, there currently are more than 1,140 registered users on the site. An estimated 260 individuals from 124 institutions, including 53 of the nation's 56 dental schools have registered for a provider account. Since March 2004, 166 ads have been posted.

For more information, to obtain a provider account, or to post an ad, contact Jackie Chmar at chmarj@adea.org or (202) 289-7201.

# Study Models and X-rays? How quaint!

Thanks to the introduction of radiological computer-assisted imaging, diagnoses and treatment planning in oral surgical procedures have advanced to an elevated level of precision.

> Nearly 15 years ago, noted Gilbert Tremblay in the August 2005 Oral Health, most diagnosis and treatment planning were based on study models and standard radiology procedures. Now, however, computed tomography allows dentists to make assessments with greater precision the position of the dental implants to important structures such as the nasal cavity or inferior alveolar canal.

For example, in the case of a 52-year-old woman who needed implant-supported prostheses, Tremblay demonstrated how an incision guide and CT significantly enhanced the procedure and the patient's outcome.

"One may say that electronic surgery, GT surgical guides, bone osteotomy guides are time-consuming to prepare, but my experience with this case was the extra preparation procedure is largely compensated by the fact that the surgery can proceed faster, reduce operatory time ... and is more beneficial for the patients' healing."

## **Honors**

Robert L. Boyd, DDS, has been honored as recipient of the Dr. Frederick T. West Endowed Chair in Orthodontics. Boyd, a professor and chair of the Department of Orthodontics, became the first named endowed chair in orthodontics at the University of the Pacific Arthur A. Dugoni School of Dentistry.

The American Association of Oral and Maxillofacial Surgeons awarded A. Thomas Indresano, DMD, with its Donald B. Osbon Outstanding Educator Award. Indresano is professor and chair of the Department of Oral and Maxillofacial Surgery at University of the Pacific Arthur A. Dugoni School of Dentistry. The annual award is given to a single educator in the U.S. exemplifying the highest standards in education and patient care, as well as cultivates research in oral and maxillofacial surgery.

Donald S. Clem III, DDS, a private practioner periodontist in Fullerton, Calif., assistant professor at Loma Linda University School of Dentistry, and adjunct clinical professor at the University of Texas, San Antonio, was honored with an American Academy of Periodontology award. The special citation was presented to those who have made a specific contribution to the academy through a special project, committee assignment or other activity in recognition of various outstanding contributions to the AAP.



# **Avoid Being Scammed by Drug Abusers**

It's not always easy to tell the difference between a legitimate patient seeking dental care and a drug abuser looking to score illegally, that's according to the Drug Enforcement Agency website, www.deadiversion.usdoj.gov, on the abuse of prescription medications.

In an effort to help, the agency has provided health care practitioners with ways to identify potential abusers. When added up, drug-seeking patients exhibit certain behaviors that indicate

their true purpose in going to dental or other medical offices.

In a recent issue of the newsletter of the Oregon Dental Association, indicators include the need to be seen immediately; wanting an appointment at the end of the day; stating they have an allergy to specific non-narcotic drugs or that they do not work; feigning psychological or physical problems; or mentioning they are traveling, visiting friends or relatives. Other red flags can include statements their prescriptions were stolen or lost and need immediate replacement; using guilt, threats, or sympathy to pressure the practioners into obtaining drugs; or pretending to be a patient of a practitioner who is unavailable; or refuses to reveal the name of a primary or reference dentist or physician.

Upcoming Meetings	
2006	
March 1-5	Academy of Dental Practice Administration 50th Anniversary, Dana Point, Calif., (800) 689-7515.
March 15-18	Academy of Laser Dentistry, Tucson, www.laserdentistry.org.
April 27-30	CDA Spring Session, Anaheim, (866) CDA-MEMBER (232-6362).
May 16-20	American Academy of Cosmetic Dentistry 22nd Annual Scientific Session, San Diego, (800) 543-9220.
Sept. 15-17	CDA Fall Session, San Francisco, (866) CDA-MEMBER (232-6362).
Oct. 16-19	ADA Annual Session, Las Vegas, (312) 440-2500.
Dec. 3-6	International Workshop of the International Cleft Lip and Palate Foundation, Chennai, India, (91) 44-24331696.
To have an event included on this list of nonprofit association meetings, please send the information to Upcoming Meetings, <i>CDA Journal</i> , 1201 K St., 16th Floor, Sacramento, CA 95814 or fax the information to (916) 554-5962.	



# Robots, Bionics, and Bioengineered Replacement Parts in Dentistry

Janyce Hamilton



ver since Dolly the sheep was cloned, things just haven't been the same. Researchers produced glow-in-the-dark rats. 1,2 A man's ear was grown on the back of a mouse (sure it was a polyester-human cartilage cell blend, but what did you expect?).3 And then last year, a 58-year-old amputee from Tennessee demonstrated the first bionic arm, flailing it about like a real arm — according to his thoughts.<sup>4</sup>

The doors have been blown off their hinges in medicine.

But hold on to your rubber gloves, because the era of "SciFi-like" dentistry" is dawning. This article summarizes the best innovations in medicodentistry either in the past few years, currently under way, or on the drawing board. This includes robotics, bionics, bioengineered regenerated tissues, and replacement parts.<sup>5</sup> Let's not forget 3-D virtual reality simulators. In addition, the newly bionic armed, Jesse Sullivan, and the inventor of the technology, Todd Kuiken, MD, PhD, agreed to answer some questions about the first bionical limb. And they speculate on what this could mean for a human bionic jaw.

Author / Janyce Hamilton is a freelance writer working out of Naperville, Ill. Her previous articles for the Journal of the California Dental Association include "The Link Between Periodontal Disease and Systemic Diseases: State of the Evidence 2005," "Assessing 'Real Science': Poor Studies, Industry Taking Toll," and "Dental Implications of the Human Genome Project."

## World's First Bionic Robotic Limb

Dayton, Tenn. — It was 2001, and a freakish electrical storm had blown into town. A transformer had been hit, and Tennessee Electric Company was in response mode. Jesse Sullivan was working that day in his hometown, like he did most days. As an electrical linesman, this fix was his job. As he grabbed a high-tension wire, a flash of lightning lit up the transformer with 7,000 volts.

Everything was white, then blackness. When he awoke, he learned that death had almost taken him. Emergency surgeons had sewn up his shoulders — where both arms had been burned off.

There wasn't a retirement party. He just didn't go back to work.

Todd Kuiken, MD, PhD, director of the Neural Engineering Center for Artificial Limbs, Rehabilitation Institute of Chicago, and half a dozen colleagues working together, had wanted to try out his newest nanotech-enabled robotic myeoelectric prosthetic limb. Sullivan, fortunately and unfortunately, was in the right place at the right time.

A surgical team offered him a trade-off. They would give him one traditional hook-and-claw arm. For the other, however, they could attempt something that would make him famous. He agreed. So, they took four nerves ending at his shoulder that would have traveled to his arm, and relocated them in his chest muscles along with electrodes. The nerves grew into the muscle.

"The innovative part for us is regrafting nerves from an amputated limb for the purpose of communicating with a prosthetic limb," Kuiken explained.

Successful surgery thrilled Sullivan, who was only a little let down to eventually learn he couldn't wear the arm at home full time right away. Once when he had been, he broke 12 stainless-steel bolts trying to pull-start his lawnmower. Version 1.0 was not infallible, and it was difficult for researchers to be satisfied, so they continually improved it and asked Sullivan to test-wear it.

The electrodes sense the thought-generated nerve impulses, such as "close hand," and the pectoral muscle contracts, which is carried through the mechanical arm, causing the hand to close. What's more, he can "feel" what his hand does — the first time "a sense of pressure" has been achieved in a prosthesis. Closing his hand feels like squeezing a tennis ball, he reported.



Jesse Sullivan is the recipient of the world's first bionic limb. He can use it to vacuum, carry groceries, eat dinner, take out the trash and put on his socks.

Kuiken and his team have put Sullivan through an obstacle course of duties at the institute to test his bionic arm. He can use it to vacuum, carry groceries, eat dinner, take out the trash, and put on socks. Because of the costs associated (not a discussion point in the interview, but reportedly in the millions), they don't want him putting the arm through its paces just yet. Thus, paused mid-gesture like the horror movie The Hand, the arm stays at RIC in the equivalent of a velvet-lined vault. Meanwhile Kuiken tweaks the newest version — the third prototype of the arm.

"Our goal is to have a sturdier, lighter-weight, more cosmetically appealing six-motor arm for him to take home within the next two years," Kuiken said.

He can perform complex tasks like shaving and picking up an egg.

"I throw a ball with my grandson, do laundry, and minor household repair such as painting. I've laid brick with it and I'm also in the process of refinishing my old truck, and the arm has been very useful for that as well," Sullivan said.

Kuiken explained one of the phenomena from moving the sensory nerves from the hand to the skin area of the chest, where his muscles were re-enervated. "By touching a certain spot on Jesse's chest, it feels like you are touching one of the fingers on his amputated hand. The possibilities with this are endless."

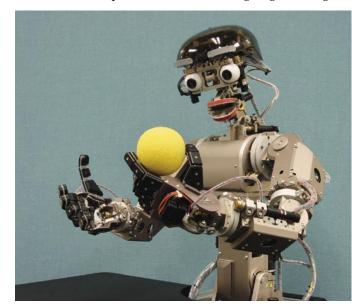
Sullivan is the first person in history, the proud director explained, who actually feels how hard he is squeezing with his prosthetic hand. "He can also feel hot and cold in the hand, within a normal range."

So, a robotic prosthesis (nearly 2 pounds of aluminum, carbon fiber, a 64-bit microprocessor, 14.8-volt lithiumion battery, motor and gearbox), with its dog sniffing-like electrodes implanted in the chest, now "hears" the brain's command and triggers the muscle to move the former arm to pick up a glass of orange juice. Perhaps this is the bionic invention of the century. But, the century is young ...

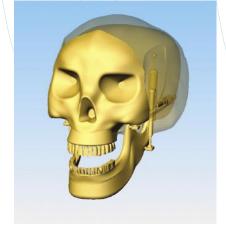
## Is the Bionic Jaw Inevitable?

When asked about the possibility of a bionic jaw similar to the bionic arm, Kuiken didn't wish to comment. He hadn't thought about it. But Sullivan said he thinks the opportunities with science and robotics seem endless. He added that he hoped his bionic arm would inspire research into every type of replacement surgery, "I genuinely hope this research helps others achieve a level of independence they may not have access to today."

That includes chewing gum and blowing bubbles. What's to stop researchers from designing, creating and



The Infanoid is a lifelike child robot developed in Japan to study communications of young children.



This prototype illustration is of a robotic jaw design with human chewing trajectories that will debut in 2006. Photo courtesy of Dr. John Bronlund, Institute of Technology and Engineering, Massey University, New Zealand.

testing a different nanotechnological robotic feat - an enervated bionic jaw? It's only a matter of time. The only question is will it be all robotic (enervated but removable) or a surgically implanted - permanent and fixed — hybrid jaw: a fusion of human-synthetic parts?

If it's the former, perhaps it will look something like the robotic human jaws already worked up for evaluating food texture, teeth presence vs. absence, and a tooth shape's impact on masticatory efficiency.

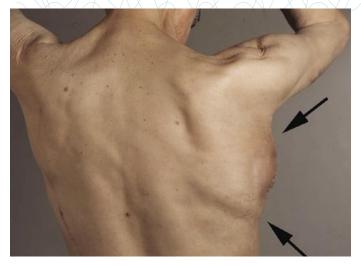
Drs. John Bronlund and Peter Xu at the Institute of Engineering and Technology, Massey University in Palmerston North, New Zealand, subcontracted by the University of Auckland, mathematically modeled muscles of the human face to mimic jaw movements through muscle contraction in a device debuting in 2006.6 Said Bronlund, "The device can follow human chewing trajectories exactly." The effect, perhaps, would look a little like a Halloween skull chewing stale Laffy Taffy.

As for looking toward implanting robotic systems into human jaws, Bronlund said he thinks this is far away. Configuring and coordinating the actuators for delivering the speed, acceleration, force application within the physical dimensions imposed by the human face is a wily task. So far, only the University of British Columbia researchers have made a fully functional, realistically sized jaw capable of movement for speech therapy study, according to Bronlund, but it lacks the forces required for food mastication.<sup>7</sup>

Meanwhile, Japan's tech inventors at one of its more advanced telecommunications corporations eye these robotic jaw prototypes. They hope to make a hybrid for their Infanoid — a 3-year-old child-like manikin with expressive eyes, lips, and hands used to study communications of young children.

Both nightmarish and fantastical is the imagination of what an expressive lifelike child robot would do or say. ("No" is certainly one of the first words it uttered.)

# obotics



A 56-year-old man who lost most of his mandible to cancer surgery is the first person to have his own mandible regenerated. It grew on his back. Reprinted from the Lancet, Vol 364, Warnke et al, Reconstruction of human mandible by tissue engineering, Pages 735-70, Copyright 2004, with permission from Elsevier.

Those with congenital or acquired diseases paralyzing or necessitating partial removal of the jaw, or who suffer maining attacks or accidents, some self-inflicted, are lining up for such surgery. One man who did had not eaten solids for nine years because surgeons had hacked away at his mandibular cancer to keep it from eating up his head. And at age 56, he got a oncein-a-lifetime proposal: Would you be willing to be the host site for us to attempt to grow you a second mandible?

Soon a surgical team from the Department of Oral and Maxillofacial Surgery at the University of Kiel in Germany, headed by Patrick H. Warnke, MD, DMD, began to employ techniques, some already tested, but in regrowing an exact duplicate of the man's missing jawbone — on his back. So they did.

3-D CT and computer-aided design techniques were used to create an exact replica model of what his healthy jaw would look like, a boon in the planning portion of this pioneering surgical feat. And a simple titanium mesh cage, like a terra-cotta container, was filled with the "human potting soil" of bone mineral, morphogenetic protein and the patient's own marrow. Next, it was implanted into the latissimus dorsi muscle. Seven weeks later, X-rays indicated the jaw was ready. Surgeons removed and delicately transplanted it into the remnants of what once was the patient's lower jaw. Four weeks later, the patient ate bread and sausages: foods that just weren't the same in pureed form.<sup>8</sup>

In 1999, a team from the University of California, Los Angeles, "transferred a totally prefabricated mandible and lower lip and integrated implants subsequently in the mandible," according to the lead researcher, Jay Orringer, MD.9 It did not, however, involve regrowing the mandible. For that surgery, bone was harvested from the iliac crest. The defects from borrowing bone can extend healing time, part of the reason regenerating tissues has such appeal.

And if a patient's retained teeth and salivary glands aren't fully intact and functioning, these details will be managed in the future, for research teams are working on both. For example, Harold Slavkin, DDS, former director of the National Institute of Dental and Craniofacial Research and current dean of the University of Southern California School of Dentistry, sees only finer refinements to "biomimetics," the design and fabrication of structures and functions based upon biological knowledge to regenerated cells, tissues and organs such as teeth, bones, muscles, and nerves. Teams have been working on the planning of cross-disciplinary projects for, or directly upon, regenerating teeth at California dental schools, Harvard-affiliated medical centers, and around the world although no one would return a call inquiring about the progress on this front.<sup>10</sup> An interesting theory to emerge from the "tooth seed" experiments is there appears to be dental stem cells, which aren't wholly free of controversy. 11 As in the years when the anti-vivisection debate was on the front burner, so today it isn't in a researcher's best interest to draw unwanted attention by providing a quote to any media outlet about fetal, cord, or adult stem cell projects.

Bruce Baum, DMD, PhD, chief, Gene Transfer Section of NIDCR, Bethesda, Md., works with a team on gene transfer and biotissue engineering of an artificial saliva gland prototype.

"Our gland is a small, test-tube shape lined with cells," he said.

Baum didn't think the gland would apply to a bionic jaw prototype, which he speculated could utilize existing functioning salivary glands, should one be designed. Rather, his artificial salivary gland would replace destroyed glands or be used for minimally functional saliva-producing individuals.

"It's been eight years now, but almost everything has been done but implantation in a human. We keep getting closer," said Baum.

Scientists may be wondering what happened to the \$3 billion that voters approved by ballot measures in late 2004, via the California Stem Cell Institute Initiative. At some point in 2005, millions of dollars in research support for fetal and adult stem cell biology (not to mention applications for tissue and organ regeneration) were slated for distribution, according to Slavkin. But as of November 2005, two lawsuits reportedly supported by pro-life organizations were filed, forcing the state to halt disbursing the dollars to researchers. 12 No matter how long it takes to untangle this ball of litigation, and whatever the outcome in the state, science will move forward, here, elsewhere in the country or abroad.

One gets the feeling of science as a child who had tossed her tiny snowball down from peak of the Swiss Alps.

In our lifetime, the world will probably see human parts conking out well before their owners, only to be swapped out by a motorized plastic pump, a cloned one from one's cells grown in a swine, or a combination of, or variation on both. Like an alarm clock, the next heart might have NiCad battery backup. Or with a port if one's on battery power and it's losing juice; it's time for a break. Enjoy a green tea smoothie while plugged into A/C for a recharge. The author is reminded of a bumper sticker thought up on her last birthday while registering at the Driver's License Bureau to donate body parts, "Live Forever: Be an Organ Donor to an Organ Donor."

Health care professions are pulling into the Land of Bots, and one guess who'll be doing the surgeries. C3PO, can you lend me a hand?

### **Robotic Surgery Performed Across the Ocean**

Perhaps one has heard of the Zeus Surgical System by Computer Motion. It performed the famed "Operation

The da Vinci Surgical System is a robotic platform that consists of a surgeon's console, a patient-side cart with four interactive robotic arms, a high-performance vision system and EndoWrist instruments. Photo Copyright 2006 Intuitive Surgical, Inc.

Lindbergh" to removal a gall bladder from a 68-year-old female patient in Strasbourg, France, while the surgeon operated from Mt. Sinai Hospital in New York in 2001. The patient left the hospital after the usual 48-hour stay.

In February of 2003, telerobotic-assisted surgery was conducted between two distant hospitals in Ontario, Canada. At one, a doctor manipulated the equivalent to what used to be known in the video gaming world as "joysticks" on control panels; at the other, the second doctor supervised the robot surgical system carrying out the other's commands during a live operation on a sedated patient.

Since then, Intuitive Surgical acquired Computer Motion, and has introduced the da Vinci Surgical System. In 2004, an estimated 20,000 surgeries were performed using this robotic system.<sup>13</sup> The system's robots "scale, filter and seamlessly translate the surgeon's hand movements into more precise movements of the EndoWrist instruments" according to company's website. What's more, the console master control is operated by the surgeon; it controls not one but four robotic arms. One may be able to pass the scalpel to yourself while

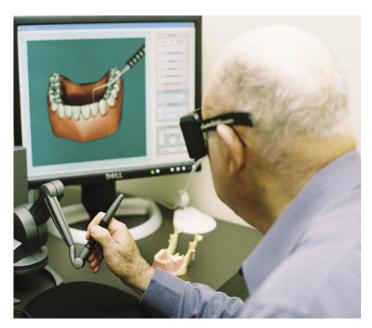
> suturing with the other hand, holding a camera to record the operation with the third, and using the fourth to feed the surgeon an egg salad sandwich. Even surgeons with Parkinson's disease and multiple sclerosis should be able to practice longer by having a precise, steady robotic hand doing the work. The 3-D stereoscopic viewer means surgeons feel immersed in the patient's anatomy and pathology.

At the University of Southern California, da Vinci has been used in the Department of Cardio-Thoracic Surgery in the med school.

"The image of robots doing our work for us like cleaning our carpets is envisioning big robots. The robotics in medicine and oral surgery are ultra-mini devices, some smaller than we perceive with the human eyes, nanorobots," said Slavkin.

Da Vinci-type technology has many potential military applications. For example, one day, maybe the Army, which could use this telesurgery by surgical experts over the Internet to the battlefield, could save solders' lives without endangering the surgeon.

When it comes to craniofacial emergencies, especially for wounded soldiers overseas, Stephen Rouse, a retired military dentist and senior medical engineer at the Walter Reed Army Medical Center, Washington, D.C., uses a 3-D-enabled system. If projectile debris from a roadside explosive puts a hole in a person's head, the correct fit of a replacement "implant" of the missing skull is most important. While the soldier is attended to by medics, Rouse, and Dr. Erge Edgu-Fry get to work. In a few hours, they use CT, MRI, photographic images of the patient pre-injury and modeling software (Freeform Modeling Plus, SensAble Technologies, Woburn, Mass.), to create a virtual clay patch. Digital sculpting tools carve and smooth. The completed model is used to create a 3-D prototype of epoxy resin, which a lab then makes into a implant as if it were another set of rush-job dentures. Overnight delivery to the hospital or hand carried, the patient has something much better than the old-style metal plates. Why stop at robotic surgery; how about robotics and 3-D oral cavities for teaching?



The Dental Simulator looks three-dimensional when a dental student wears 3-D goggles. The probe on the screen moves where the student moves the virtual reality scaler, as Dr. Arnold Steinberg demonstrates.

# Robotic Handpiece Simulators and 3-D Virtual Reality in Education

Dental students are just starting to be trained using prototype robotic handpieces to feel and manipulate 3-D virtual reality teeth in upper and lower dental arches seen on a computer monitor. But how did we get here?

As in private practice, staffing is one of the most costly resources for universities. Salaries have not increased in dental schools as much as they have in the private sector in the past few decades. Not surprisingly, staffing dental departments becomes more and more challenging. As an outgrowth of the drying pool of dental school instructors, and to circumvent practicing on patients, an international crop of inventors are making a mad-dash to develop technological ways to markedly diminish teachers' time and practice on human patients. Gone are the days of playing back recordings of dry lecturers talking to the camera. Instead, virtual reality teaching simulators are coming soon to a dental school near you. The simulator will consist of a palm-sized robot handpiece and a computer screen.

University-based research teams, closely guarding their versions of this invention, race to debut the ideal simulator application. They hope theirs will be "the one" purchased in bulk by the world's dental schools. Whichever prototype is seized by the swooping talons of industry scouting for the next hot investment, rights will be sold, and researchers may obtain the prized funding to further their research.

One team hoping to land such industry funding is ready to talk about their alpha phase prototype, a collaboration between the College of Engineering and the College of Dentistry at University of Illinois at Chicago.

Far from Silicon Valley, a cold Midwestern rain pelts the University of Illinois-Chicago campus' windows, causing a White Sox banner to sag. Inside the dental clinic, rows of young masked students stiffly prepare patients, moving as if robots themselves. Professor of periodontics Arnold Steinberg, DDS, MS, hastens to reach his workroom. Once at his terminal, he dims the lights, pulls 3-D goggles over his glasses, and peers at human dentition looking so real, its curvy crowns look like they are about to burst through the glass of the screen.

Using a robotic haptic handpiece called Phantom (SensAble Technologies, Woburn, Mass.) that can mimic a probe, explorer or scaler, his invention, PerioSim, probes the tooth and gingiva on the computer screen. Yet, to his hand, the visible con-



The da Vinci Surgical System's EndoWrist instrument tips can rotate like the human wrist, allowing surgery in the closed chest, abdomen or pelvis.

tact feels life-like, not screen-simulated. Steinberg and dental collaborators such as James Drummond, a professor in both the dental and the engineering col-

leges, incorporated a realistic touch and feel to the robot handpiece. Using haptics, a sense of touch, in the robot handpiece, the student using PerioSim can feel the roughness of a calculus deposit below the gumline, for example, and the smoothness on the root after it's scaled off. On first use, the author jumped like she got a static electricity shock. The Phantom handpiece had jerked when the tip of the probe fell into a gum lesion on a molar.

Patients in rehabilitation centers are already benefiting from robotic devices with haptic capabilities. For example, in physical therapy, a person with an atrophied or numb leg can wear a robotic brace device to "feel" the movements of proper walking.

On the research horizon, for weakened jaw muscles, a robot will also be designed to help with physical therapy exercises. Such exercises would be repeatable, progress would be recorded instantly, and tracked from session to session. If a physical therapist controls the physical therapy robot, a benefit is decreased incidence of carpal tunnel, for example, in the booked-solid, but fatigued, physical therapist.

Back at the University of Illinois-Chicago, 30 clinical instructors gladly evaluated the simulator for teaching purposes, more relieved than threatened to know help is on the way. Back-breaking clinical demonstrations, leaning over patients in small groups where it's often hard to see, will be a thing of the past when the haptic-based dental simulators are here. Their verdict thus far?

"They say this is really lifelike, but not unflawed; really promising," Steinberg said. "What we can do is have an instructor go through a procedure, and record, say, a series of 15 moves, in the simulator. And without the instructor present, the student can play it back and follow along. Sight and sounds are great, but now they are holding the haptic stylus and are guided through exactly the same movements. The student will encounter the same tactile feedback felt by the instructor. Their hands actually feel what the instructor demonstrated.

"Dental schools are short on instructors because the pay isn't great, so we need simulators so students can practice to their hearts content."

Even errors can be simulated to teach common mistakes. If a simulator can be programmed to create an emergency situation when an oral surgeon cannot control bleeding after a tooth extraction, it can test whether or not the student knows exactly what to do, and if he or she can respond in a crisis quickly.

Haptic handpieces could one day be installed at every desk in a lecture hall so students could feel what the instructor is doing.

"This technology could even be deployed over the Internet for training purposes anywhere," said Steinberg.

What's next? The moon? The Space Station?

The University of Illinois-Chicago's Milos Zefran, an associate professor of electrical and computer engineering worked closely with Steinberg in getting the simulator developed. The image viewed on the computer monitor can also be deployed as a 3-D, virtual reality-projected image. This is accomplished by projecting a monitor's image onto a partially silvered mirror with the focal point below the mirror surface. The user looks at the image through the mirror and the effect is perceived by the user as hanging in space in front of the user. This allows him or her to interact and feel the surrounding components realistically as if an actual object is present.

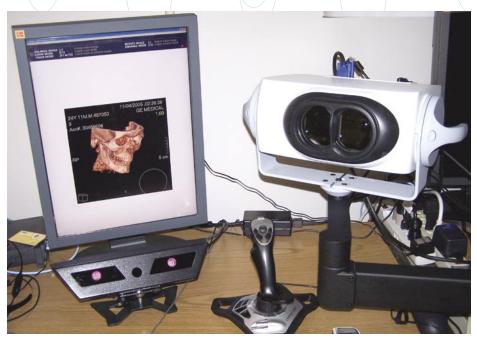
Companies such as ReachIn Technologies (Stockholm, Sweden) have programs for 3-D projection of images, much better than holograms as there is no "ghosting." 14 At the Supercomputer Center at University of California San Diego, many students tried the SynthaGram Glasses-Free 3-D monitor (invented by StereoGraphics: San Rafael, Calif.) a few years ago. 15 Eyewear, however, still provides a superior effect. But since Real D of Beverly Hills, Calif., acquired the company in 2005, improvements such as digital monitors have been made. The company's 3-D projection technology underlies the 3-D version of Disney's recently released "Chicken Little." But will this high-profile involvement change medical and dental virtual reality capabilities? "In time" is probably the best answer for now.

Because in medicine everything will be imaging soon, so goes dentistry. Steinberg predicts students won't have to work on artists' graphics of generic teeth, roots, and other oral tissues on the screen. With MRI and CT scans, a graphic will one day be made exactly of the individual to be operated upon, viewed in 3-D. So, a student can soon practice surgery on a simulation of his patient's thin, weakened mandible to try out a surgery plan and drill sizes, before actually doing the implant or tumor surgery and risking a fractured bone or broken tool.

In 2005, a 24-patient study was published on how imaging can speed up treatment. The patient population, with stable outcomes one-year postsurgery, were beneficiaries of a new 3-D implant planning software for CT scan data. Utilizing surgical templates and taking advantage of pre-fabrication, the final

denture, bridge or implant can be immediately loaded using Teeth-in-an-Hour (Nobel Biocare AB, Goteborg, Sweden). 16 Yes, for a fee, any toothless person can plop down and walk out in an hour with his permanent prosthesis in place. This may bring in dental phobics who can afford quality care, but stay away knowing they can't handle multiple visits. But it will be a partnership between imaging and robots in dentistry that gets the A-plus in dental schools. Different than simulation for training, robots will probably eventually perform the surgeries in dentistry they now are doing in medicine. Using a robot device, the actual surgery on the patient could be carried out with the computer eliminating any hand tremor that may be present. If human error will be weaned out, precise and perfect microsurgery will result. What's not to like?

We are not quite there yet, but Zefran said most dentists will certainly see the day when part of their job is to supervise robots that will prepare and fill teeth. Also in 2005, a robotic dental drill (Tactile Technologies: Rehovot, Israel) was FDA approved for testing on humans. It clamps onto the jaw, sends scan data on bone structure to a computer that uses CT data to create drill guides, which then are attached to the frame, and the dentists presses a button and the precision drilling commences. Its inventor says this could be "the first step toward more automated dentistry."17



Above is a prototype of the 3-D Stereo Display, which responds to pupil commands of the viewer and does not require goggles. The equipment enables clinicians to feel they are immersed in the image. Photo courtesy of Health Group Technology Innovation, Eastman Kodak, Rochester,

"It definitely will be possible to get a prosthetic jaw like a prosthetic limb, one day," Zefran speculated.

For Sullivan, the prosthetic robotic arm is connected to a stump. With the jaw, it's more problematic potentially due to the saliva and biocompatibility, and cosmetic issues.

"These are not insurmountable obstacles," said Zefran. "Plug in the device, use it to chew and talk, and take it out to clean it. One has to dream to design, engineer, build and test."

### **Pupil Commands to Manipulate X-rays**

Ever get the feeling that someone was staring at you, turn around, and find someone was staring at you? Now, one can have that unnerving experience of feeling like a machine is staring at you. But this time, it's trying to look you in the eye.

When Carlos Munoz, DDS, MSD, professor and chair, University at Buffalo School of Dental Medicine, Department of Restorative Dentistry, SUNY, Buffalo, visited the Kodak Health Group innovation lab in Rochester, N.Y., he got a surprise. "Technology is moving extremely fast. So fast that you can move an X-ray and enlarge it with your eyes."

Next, Munoz characterized the eye-gaze tracking and 3-D stereo display prototypes, he saw "calibrating the eyes" pupils" and responding to them, along with voice commands, and then seeing the patient image in the 3-D stereo display. The manager of Eastman Kodak's Health Group

Technology Innovation, Steve Russell, talked about the "immersive" system as "autostereoscopic"— no glasses or headgear needed.

But unlike the other companies trying to come up with their own prototypes of glasses-free monitors with 3-D effects, this one uses voice recognition to help command the system to enlarge, reduce, zoom in on a segment of the patient image, enhance an image to see more detail, or mark areas of interest to include in the patient's record. The authorized user will also be able to access other information in the patient's electronic medical record without having to leave the patient's chairside.

Russell described these efforts as part of the company's health care workflow solutions: "The advanced prototypes allow clinicians to experience and navigate images as never before. The viewer feels as if they have been immersed into the image. Three-D stereo displays and other advanced human-computer user interfaces, like eye-gaze tracking and voice recognition, will eventually surpass current technology, reducing the clinicians reading time, improving performance and productivity, and enhancing workflow. "

### Limitations

Using minimally invasive procedures for fast healing, miniaturized motors and nanosized technologies is exciting. Replicating and manipulating human body functions is otherworldly. Employing robot arms in the practice of oral craniofacial surgeries and restorations will be better than playing a computer game because it will be the real deal.

But cost-benefit ratio in these advanced areas today is so lopsided, it can be a "guesstimate" for researchers to estimate additional funding that will be needed, even after they've started a robotic or bioengineering project. As a result, once the checks written from the grant account bounce, it's time to take out a personal loan or cross one's fingers for investors.

Fred Eichmiller, DDS, director of the ADA Foundation's Paffenbarger Research Center in Gaithersburg, Md., espoused a pragmatic view: "This is fun, but its population impact benefits are very few and so there won't be taxpayer dollars going into it. In education, robots make sense because there's a shortage of instructors. But when it comes to using CAD-CAM and robots in the dental office, there wasn't a real problem to begin with, so this is like nanotechnology in search of problems."

In dental education, 3-D virtual robotic simulators may

be a challenging shift in the role of human educators. But it remains uncertain if universities can come up with the cash to invest in their development or purchase more than a few of them for clinical training.

The cry is "the big companies will pay for it," but not so fast. Handing over millions isn't the way of the big consumer health companies in the 2000s, with their acid-refluxing stockholders instead clutching the comforting promise of steady sales in the next swan-shaped toothbrush head.

If manufacturers analyze the investment and see a guaranteed return, they toss in a line baited with a small pilot project and see if it lands the biggie. Even the average American, who may have amnesia about world and national events, can name the date of "Black Monday." When it comes to their money — no one forgot the tech stock craze that wooed first-time investors and later deflated the tires on their hopes and dreams.

#### Conclusion

Previously unthinkable innovations, such as spray-on skin cells for burn victims, are the grist of researchers pushing to see how far than can go in medicine.18

Meanwhile in the oral craniofacial field, so poorly characterized by the catch-all term "dentistry," bioengineered replacement parts are in the works. Like when a big organic grocery chainstore puts out of business the small grocer in the same strip mall whose buyers didn't know people really do want organic ginger-teriyaki portabella wraps rather than tuna salad hoagies, there's good news and bad news.

The good news is that oral training and care will eventually be improved by robotics, bionics and bioengineered parts. The bad news is it might take some time because these are diamond-studded inventions with platinum parts — the most expensive research the profession has seen yet.

According to a 2005 American Association of Oral and Maxillofacial Surgeons report, emerging technologies are unstoppable and all over the board.5 For example, "biological glues" for bone welding could one day replace metal fixation.

Finally, for those who think the bionic jaw is highly improbable, a "mandibular growth center" is in the crosshairs of a team of collaborators from the Massachusetts General Hospital's Departments of Oral/ Maxillofacial Surgery and Oral Fabrication and the Tissue Engineering Laboratory. The team is also reportedly already entrenched in engineering a

mandibular condyle substitute.5

Now, if all the people in this report would just talk to each other during a weekend retreat. Or even just use up their "Free Anytime" minutes. The news headlines would be announcing the first bionic jaw sooner rather than later.

One request, however. Candidates for motorized jaws must be "the quiet type."

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# ORAL HEALTH ASSESSMENT for California Schoolchildren: ARE ORGANIZED DENTISTRY and the CALIFORNIA LEGISLATURE RECEPTIVE to the CONCEPT?

Santos Cortez, DDS, and Paul A. Reggiardo, DDS

# ABSTRACT

The need to improve the oral health of children in our state has been welldocumented in the past 10 years. The concept, however, of intervention by identification of the dental disease process on a widespread basis at the age of school entrance has only recently been advanced.2,3 In view of the fact that dental caries remains the No. 1 chronic disease of childhood, the need for intervention no later than the time a child enrolls in primary school may be a way to reduce the oral health problem before it becomes emergent.4

t is well-recognized and readily accepted that children entering school, usually at the kindergarten level, are required by statute to undergo a physical screening.5 The health assessment requirement is embedded in the state education code. Section 49450. A similar model exists for oral health assessments in several states, although none of these are exactly the same. Illinois, the most recent state to mandate dental examinations, requires children entering kindergarten, second, and sixth grades to provide a certificate of completion of a dental examination by May of the school year. Pennsylvania has required oral health screenings for schoolchildren for more than 50 years, and Georgia, Rhode Island, and the District of Columbia each have enacted some form of similar legislation.

The overarching goal of these mandates is to reduce the likelihood that untreated dental disease will progress to emergent problems, such as chronic pain, dental abscess and facial cellulitis. each of which interferes with school readiness and school learning (Figure 1).

The enormity of the problem of untreated dental disease in California schoolchildren was recently and eloquently addressed by California



Figure 1. Untreated dental problems can interfere with a child's learning or school readiness.

Assemblywoman Wilma Chan, D-Oakland, in her report to the Legislature, "Preparing Our Children to Learn: Report of the Select Committee of





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Figure 2. Policies have been developed to help prevent dental conditions in schoolchildren, such as multiple decayed primary and permanent

California Children's School Readiness and Health."6

The relationship of chronic toothaches and the inability of schoolchildren to concentrate in school or study at home should be an obvious one. Unfortunately, these conditions for the most part go unnoticed or unrecognized until reaching crisis proportions. School readiness demands that oral health needs be addressed when the child is entering school, not when missing it for treatment of pain or correction of disease conditions.

The American Academy of Pediatrics and the American Academy of Pediatric Dentistry each adopted policy statements which recommend dental evaluations, preventive care and counseling, and anticipatory guidance no later than 12 months of age.7 These policies, which have been in place for a number of years, have not been universally incorporated into the fabric of dental practices. The aim is to prevent dental conditions dentists now see in many schoolchildren, multiple decayed primary and permanent teeth that require extensive and expensive restorations (Figure 2).

This paradigm shift may take

many more years before gaining universal acceptance. Almost one-third of California preschoolers have already experienced tooth decay and this figure rises to almost 70 percent by third grade. Yet dentists still recommend children receive their first dental examination at age 3 or even later.8 This, of course, is too late for those children whose decay process started in infancy. The Healthy People 2010 March 2004 update reports that 23 percent of all U.S. children ages

THE RELATIONSHIP OF CHRONIC TOOTHACHES AND THE INABILITY OF SCHOOLCHILDREN TO CONCENTRATE IN SCHOOL OR STUDY AT HOMME SHOULD BE AN OBVIOUS ONE.

2 to 4 have visible caries experience (cavities or fillings), and for 87 percent of these children, the decay is untreated. By age 6 to 8, the numbers rise to 50 percent visible caries experience, more than half of which is untreated.9

Projects such as the First 5 California "First Smiles" and the state specialty organization representing pediatric dentistry, the California Society of Pediatric Dentistry, each have effective educational programs in which professionals and caretakers are provided sciencebased messages about early intervention. These organizations believe that if dental professionals aggressively address issues of prevention and early childhood examinations, as well as universal oral health assessments at school entrance, the goal of a caries-free pediatric population may be on its way to becoming a reality in this state.

Programs such as the Pediatric Oral Health Access Program, supported by the California Dental Association Foundation, create opportunities for general dentists to become more comfortable inviting infants and young children into their practices. Participating dentists receive didactic lectures, seminars and case presentations, hands-on "bench" training in pediatric dental procedures, a course in oral conscious sedation, and mentoring in a pediatric dental office.

## **Legislative Initiative**

As the argument for oral health assessments became clearer, the California Society of Pediatric Dentistry in June 2001 adopted a resolution supporting mandated school entrance dental examinations. Subsequently, in response to a request from CSPD, the American Academy of Pediatric Dentistry in 2002 charged its Council on Clinical Affairs with developing an Oral Health Policy Statement on school entrance exams. That policy, which was approved by the AAPD General Assembly in May 2003, reads, in part, "AAPD supports legislation mandating a comprehensive oral health examination by a qualified dentist for every student prior to matriculation into school."10 In October 2003, the House of Delegates of the California Dental Association approved a resolution supporting the concept that every child should receive a dental

examination at school entrance and directed that a task force be created to develop a position paper and implementation strategy behind this principle. The Task Force submitted their report to the CDA Board of Trustees in August 2004.11 The board accepted the recommendation of the Task Force that CDA stand behind the concept of mandated school entrance dental examinations, which were now termed oral health assessments, and urged adoption by the House of Delegates of a resolution directing the CDA Council on Legislation to consider legislative remedy. The House of Delegates, meeting in October, overwhelmingly approved the resolution.

In response to the action of the house, and at the direction of the Council on Legislation, CDA's Office of Public Policy and Strategic Development in November 2004 composed draft language and began the arduous process of securing introduction of a bill in the 2005-2006 legislative session. In February 2005, Assemblywoman Chan, who chaired the Assembly Select Committee on California Children's School Readiness and Health, agreed to introduce the proposed legislation. The bill, now identified as AB 1077 (pupil health), was successfully heard by both the Assembly Health and Assembly Education committees this year, before stalling in the Assembly Appropriations Committee in May. Further consideration of the measure must now await the commencement of the second year of the 2005-2006 Legislature in January.

The goal of this initiative is for all of California's children to secure a dental home and be caries-free. The report of the CDA Task Force recognized this will only be accomplished as a multistep process occurring over many years. A key element of the Task Force implementation plan is to reach both parents and children with appropriate oral health information and education as they enter school. Other elements of the plan include gathering essential demographic information to determine areas of greatest need and encouraging the creation of programs best meeting

> THE GOAL OF THIS INITIATIVE IS FOR ALL OF CALIFORNIA'S CHILDREN TO SECURE A DENTAL HOME AND BE CARIES-FREE.

the individual needs of each community as well as building public awareness of the importance of oral health and recognizing that program development will need to address barriers such as funding, case management, workforce issues, cultural diversity, and geogra-

The bill before the Legislature would allow dental examinations or dental screenings by dentists or other licensed or registered dental health professionals in a variety of clinical or school-based settings. The parent or caretaker would provide evidence to the school the assessment has been completed. The school would provide a standardized form that the dentist or other dental health professional could use to record and report clinical findings. Parents or caregivers could exempt their child from the requirement if they felt it posed an undue financial burden, was hindered by lack of access to a licensed dentist or other licensed or registered dental health professional, or if consent was withheld for other reason.

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# JONATHAN TAFT Dentistry's Great Forgotten Hero

Malvin E. Ring, DDS

#### ABSTRACT

One of the greatest figures in the development of the dental profession to the high status it enjoys today is all but forgotten. Jonathan Taft was dean of the second dental school in the world and wrote the most important clinical textbook of his time, one that was reprinted in many editions over a quarter of a century. Later appointed dean of the new University of Michigan Dental School, he instituted innovations in admission requirements and course of study that were copied by all subsequent schools and are the standards adhered to today. The editor of one of the most important dental journals for 44 years, a record unmatched to this day, he set the standards for modern dental periodical literature that have done so much to elevate dentistry that today it stands on a par with medicine as a truly science-based profession. He served dentistry in many capacities: president of the American Dental Association, founder of the National Association of Dental Faculties, and founder of the National Association of Dental Examiners. Over his lifetime, he published almost 200 professional papers and probably attended and lectured at more dental meetings than anyone of his day and since. His memory should be resurrected, and the profession must be made aware of the great debt it owes to this intrepid fighter for a better dental profession.



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Figure 1. The little schoolhouse in the village of Georgetown, Ohio, where Jonathan Taft received his education. Future President Ulysses S. Grant was his classmate.

onathan Taft, a major figure in the development of dental education, dental literature, clinical innovation, and organized dentistry, was born Sept. 17, 1820, in the tiny hamlet of Russellville, located in the southwestern corner of Ohio, about 50 miles east of Cincinnati. His father, Lyman Taft, was a farmer and a native of Massachusetts who moved to Ohio two years before Jonathan was born.

Jonathan's early education at first was in the common school of the community, but he transferred to a tiny private school in the village of Georgetown, about 10 miles from his home (Figure 1). He was a classmate of a general and future president, Ulysses S. Grant, whose father was a tanner in Georgetown. When he finished school at 17, young Jonathan tried his hand at teaching. But in 1841, he decided to study dentistry.

#### Taft's Dental Education

In accord with the established custom of his day, he became a preceptoral student and studied dentistry with Dr. George D. Tetor in the village of Ripley, about eight miles south of his home, on the Ohio-Kentucky border. After two years, he left Dr. Tetor to set up his own office in that village, but soon relocated in 1844 to the larger town of Xenia, not far from the city of Dayton.

In 1845, a group of Ohio dentists, led by Dr. James Taylor, (a close friend of Chapin Harris who was one of the founders of the first dental school in the world, the Baltimore College of Dental Surgery), organized the second dental school, the Ohio College of Dental Surgery, in Cincinnati. Taft, feeling the need for more formal training in dentistry, enrolled in this new dental school sometime around 1848-1849, and was graduated from the Ohio College in 1850. He had apparently maintained his practice in Xenia during his time at the college, most likely on a part-time basis, and he remained in practice in Xenia until 1855.

His alma mater, the Ohio College of Dental Surgery, in 1854, offered him the position of professor of dental surgery, which he accepted, and in 1855, moved his private practice to Cincinnati (Figure 2).

## Taft's Awareness of Dentistry's **Need to Elevate Itself**

In an address before the Mississippi Valley Association of Dental Surgeons



Figure 2. Taft at about the time he became dean of the University of Michigan Dental School.

on Feb. 17, 1853, and before his joining the Ohio College's faculty, Taft clearly delineated his feelings concerning uplifting the dental profession. Moreover, he was well aware of the need to educate the public to the scientific nature of modern dentistry. He lauded the establishment of formal dental education and organized dentistry. But most important, he felt, was a formal dental literature, necessary for continued learning by the dentist, but also for the edification of the public. "The public are anxious to gain information," he said, "prompted occasionally by vain curiosity, doubtless, but by far the greater part, by pure motives. The professional man, who desires the elevation of his profession and the welfare of his patients, will not fail upon all proper occasions, to give information in regard to his profession."1 With confidence he assured his audience that when the public is properly informed it will demand perfect, instead of cheap, operations. Of vital importance, he stressed, was the need for new professional journals, so that all dentists could be kept abreast of scientific advances which would set them apart from the purely "mechanical" dentists. He ended his lecture with a ringing declaration of the future he foresaw, where "new associations will be raised up. New schools opened, and periodicals multiplied. When all these agencies and others that will arise, shall have been brought, in their appropriate and extended influence to operate, then we may anticipate a progress and rapidity of development unparalleled in the annals of science."2 His prescience was remarkable, for we see today not only the high esteem in which dentistry is held, but the tremendous advances that have put this profession on a par with medicine.

#### The Growth of Dental Literature

Keenly aware of the need for proper dental journalism, and while still a student, Taft published his first clinical article, "Abrasion of the Teeth," in the New York Dental Recorder in 1848. He followed that in the journal's next issue with an article, "Irregularity of the Teeth," which served as the basis of a paper he presented before the local dental society.

One of the earliest dental journals, The Dental Register of the West but commonly referred to merely as the Dental Register, was launched in Cincinnati in 1847 under the aegis of one of the earliest active dental societies, The Mississippi Valley Association of Dental Surgeons. James Taylor, MD, DDS, thendean of the new Ohio College of Dental Surgery, assumed the post as editor, with B.B. Brown, MD, as associate editor (Figure 3).

Cincinnati was a good choice for a new dental school and a new dental journal, situated as it was athwart the

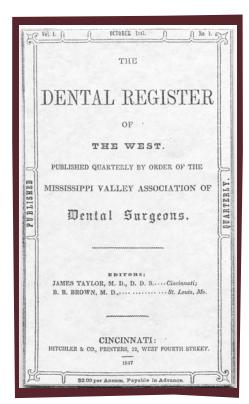


Figure 3. The front cover of Vol. I, No. I of The Dental Register of the West, October 1847. This publication was issued for 76 years, and Taft was editor from 1856 to 1900.

gateway to the western lands. During the first 40 years after its founding, Cincinnati experienced spectacular growth. By 1820, its citizens, extremely proud of their city, were referring to it as "The Queen City" or "the Queen of the West." A local newspaper boasted "The city is, indeed, justly styled the fair Queen of the West. Distinguished for order, enterprise, public spirit, and liberality, she stands the wonder of an admiring world."3 It was a vibrant manufacturing city, continually attracting new residents. In fact, between 1850 and 1900, Cincinnati was the machine tool capital of the world.

# The Growth and Influence of the Dental Register of the West

The Register's first issue had 48 pages and the subscription price was \$2 a year. Unfortunately, of its 80 subscribers, only 70 paid, and at the end of its first year, it was in the red for \$150. Fortunately, the association made good the deficit. The second volume did hardly better financially. Beginning with the third volume in 1851, the ownership of the journal passed to Dr. James Taylor and continued until the end of the ninth volume in 1857, when he sold it to Taft and Dr. George Watt, who became joint editors of the publication. By this time, under their guidance, it had become a much larger and influential publication, with the ninth volume containing 448 pages. In the interim, the Register had again been sold to John Toland, an enterprising owner of a dental supply house in the city. Still plagued by delinquent subscribers, Taft, as editor, instituted what he called his no pay, no journal policy, and insisted on payment in full in advance. This brought the magazine back to full solvency, which it remained until its demise.

At the beginning of the Civil War, Toland enlisted in the Union army and unfortunately was killed in 1863. At that point, Taft and Watt took over ownership. In 1873, Taft became the sole owner and editor. The Dental Register had become one of the longestrunning publications in the history of American dental literature, published for 67 years, from 1847 to 1923. It was under Taft's direction that it became one of the most esteemed.4 His importance to the advancement of dentistry was recognized by Dr. L. Pierce Anthony, an eminent leader of the profession, who wrote of Taft, "He was the type of man most fitted to continue the journalistic labors of Taylor, and through his editorial connection he wielded a marked influence for good in developing dentistry throughout the

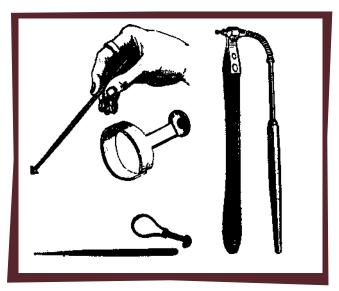


Figure 4. These pictures of the ring drill, left, invented by Amos Westcott in the early 1850s, and the drill invented by Charles Merry a few years later were both shown in Taft's Operative Dentistry.

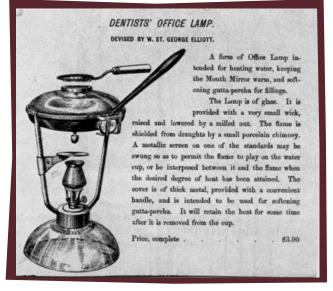


Figure 5. This illustration from an S.S. White catalog of 1876 shows a heat lamp intended for heating water, keeping the mouth mirror warm, and softening gutta-percha for fillings. The gutta-percha would be placed in the recessed cover on the top, which has a handle.

West and South."5 In 1900, Taft retired from the editorship of the Register after 44 years of continuous association with that journal, a record unmatched in dental journalism.

# Taft's Textbook on Operative **Dentistry**

A good indication of the growing importance of the dental profession was the appearance of dental literature in America, which began in 1801. The first book was a short pamphlet for patient education, written by R.C. Skinner. Between the years 1800 and 1840, 44 dental books were published. The most important were Samuel Sheldon Fitch's A System of Dental Surgery (1828), Shearjashub Spooner's Guide to Sound Teeth (1836), and Chapin Harris' The Dental Art, A Practical Treatise on Dental Surgery. This latter book was the most popular and most widely distributed. And although Harris' text has been regarded by some historians as not equal to Fitch's and Spooner's, its practical value was superior to both.6 Harris wrote in the preface to his book that his readers would see "the evidence of a progress in dentistry, most cheering to all who desire to see this branch of surgery rescued from the domain of ignorant empiricism" and that he expected that dentistry would soon receive the public and professional consideration it deserves.7

No other major text appeared in this country until 1859, when Taft published A Practical Treatise on Operative Dentistry. One of the earliest comprehensive texts, it was used by dental students and dentists alike, and was reissued in a number of editions, the last being in 1883. Taft was innovative in both his thinking and his writing, suggesting techniques new for the time and stressing thorough examination, and the taking of a complete history.

Taft also took a strong stand against the use of silver amalgam as a filling material. This material had been introduced into America by two brothers whose quack-like methods enraged the ethical practitioners. Organized dentistry, which at that time represented only a tiny percent of practicing dentists, began a campaign against the use of amalgam, a drive which soon assumed the tone of a religious crusade. Proponents of the use of amalgam were to be rooted out, and to this end, every member of the newly formed American Society of Dental Surgeons was to sign a pledge renouncing its use. But many of the members refused to sign such a pledge, feeling that the material served a useful purpose where gold could not be used, and because it was possible for poor patients, who could not afford gold fillings, to have teeth treated. These refusals ultimately resulted in the demise of the first national organization of dentists in 1856.8 Nevertheless, Taft, in his book, said that amalgam should not be regarded as a durable material. He supported gold fillings with fanaticism and endorsed banning from dental societies those dentists who used amalgam.9

Drilling cavities in teeth was a severe problem, and new drills were being invented to replace the long steel bur which was held in the fingers and twirled (Figure 4). Taft was excited about the new instruments which worked like a jeweler's drill but unfortunately had to be held with two hands. His book had pictures of the new Merry drill as well as Chevalier's drill, which eased the work of breaking through the enamel somewhat.

Of great import was his method for treating exposed pulps. The usual practice was to cover the exposure with a cap of gold. But Taft improved the technique by first covering the defect with collodion or gutta-percha dissolved in chloroform, and then covering it with a small piece of swaged gold.<sup>10</sup> It also was Taft who first suggested that root canals be sealed with gutta percha, a novel idea at a time when canals were incompletely sealed with gold foil (Figure 5).

#### The Case of Lucy Hobbs

Lucy Hobbs was born in 1833 in the tiny village of Ellenburg, in northern New York, not far from the Canadian border. Orphaned at 12, she nevertheless managed to get a high school education by supporting herself as a seamstress and became a teacher. However, she wanted to be a dentist and in March 1861, applied for admission to the Ohio College of Dental Surgery. Such boldness in a woman shocked the professors of so respectable an institution and, as a body, objected to her being admitted. Taft, as dean of the school, was sympathetic and kind to her, yet at the same time he advised her that it was not a fit occupation for a woman and told her to find a practicing dentist with whom to study. Sympathizing with her desperate plight, he agreed to let her spend three months in his office while she continued to search for a preceptor. Every dentist she approached turned her down, until after a diligent search she finally found a young dentist, Dr. Samuel Wardle, who agreed to train her in his office.

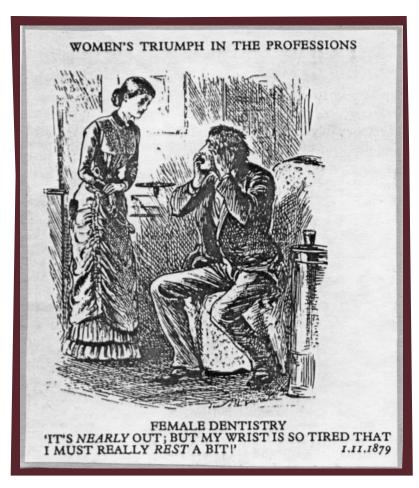


Figure 6. A cartoon deriding the idea of a woman as a dentist, from the British humor magazine Punch, January 1879.

The negative attitude toward women becoming dentists was typical of the times, and persisted until late in the century. Norman Kingsley, the foremost oral surgeon and prosthodontist in the United States, as late as 1883, came out against women being admitted to dental schools, claiming that women were not inventive and lacked "mathematical precision." He claimed that dental "operations require an excessive mental and physical strain, to which a woman is not physiologically equal."11 He suggested instead, that women be used as receptionists because of their gentleness and good taste, and as bookkeepers, because of their skill at organizing housework (Figure 6).

After two years of study with Dr. Wardle, Hobbs opened an office in Cincinnati, but soon moved to northern Iowa and set up practice, earning the respect of her male colleagues. The president of the state dental society invited her to attend the annual meeting and she made such a favorable impression that the society amended its bylaws so that a woman could be admitted to full membership. As soon as she became a member, she was elected a delegate to the American Dental Convention which was being held that year in Chicago. Upon her return to Iowa, she read a paper before her state society, becoming the first woman in the world to present a scientific paper to a dental society.



Figure 7. Lucy Beaman Hobbs Taylor at age 60 in 1893.

Her lack of a formal degree nevertheless still troubled her, and she reapplied for admission to the Ohio Dental College but was again rejected by Taft, who felt he could not ignore the demands of his faculty. At this time, however, she had unprecedented support from her male colleagues. The entire Iowa State Dental Society threatened to withdraw from the American Dental Association unless Lucy Hobbs was allowed to matriculate as a student. Taft capitulated to this show of support, and Miss Hobbs was admitted to the college from which she graduated on Feb. 21, 1866, with a DDS degree; the first woman in the world with such a degree. Taft's role in this struggle resulted in his name becoming widely known to the dental profession in this country and abroad (Figure 7).

### Taft's Role in Dental Education

Taft had been a professor at the Ohio College of Dental Surgery since 1854, and in 1858 was appointed dean of the school. It was during his tenure that he was elected president of



Figure 8. The first building housing the University of Michigan Dental School, Ann Arbor, Mich.

the American Dental Association for the term of 1868-1869. In 1872, the Michigan Dental Association proposed to the State Board of Regents that a dental school be established in conjunction with that state's university. Taft was asked to become dean of the new school and in 1875, left Ohio and took up his new post. Two years after his appointment, he was inducted as a member of the Michigan Dental Association (Figure 8).

Under Taft's guidance, the Michigan school became recognized the world over as one of the leading institutions of its kind. His school was the first one to extend the course of study from two years of six months sessions each, to one of four year's duration, each study year consisting of nine months. It also required a minimum of graduation from high school for admittance. For his exceptional leadership of the school, as well as his many accomplishments, the University of Michigan awarded him the honorary degree of doctor of medicine in 1881. After a quarter of a century of service, Taft retired from the dental school in 1900. Taft was well aware of the need for a school to have the proper educational tools available. "No educational institutions," he wrote, "especially those of more than an elementary character, can assume to be well equipped for their work without a good library and museum. The library should contain, as fully as possible, the entire literature of all subjects and branches taught in a given institution. Dental colleges should by no means be an exception in this respect."12

## Taft's Numerous Major **Accomplishments**

Taft's work was not confined to the school. In 1884 he was responsible for the founding of the National Association of Dental Faculties and served as its president from 1899 to 1900. This organization was later to become the American Association of Dental Schools, which continues to function to this day.<sup>13</sup> In 1883, Taft founded the National Association of Dental Examiners and was named the first president; he was re-elected to this post for three more terms.

Dentistry was frequently treated as a subspecialty of medicine, and thus when the International Medical Congress was held in 1887, Taft was named chair of the Section of Dental and Oral Surgery. Three years later, in 1892, he became chairman of the Section of Oral and Dental Surgery of the American Medical Association. And when the World Columbian Dental Congress was held in Chicago in 1892, he was a member of the executive committee.

Over the course of his lifetime, Taft published almost 200 professional papers. He was a member of every important organization for the advancement of his chosen profession and he attended and lectured at more dental meetings and conferences than any other dentist of his time.

After a lifetime of service to dentistry, Taft died Oct. 16, 1903, at the age of 84, and was buried in the Spring Grove Cemetery in Cincinnati. Almost every dental journal in the country carried a lengthy obituary of this great figure in dentistry, and dental societies across the land lauded him. An excerpt of the eulogy by the faculty of the Michigan dental school stated:

"He was ever ready to make needed sacrifice of time and talent for his beloved profession, and especially for the school of dental education to which he gave so many years of valuable service. He labored to make this a leading school for training men to the highest ideals of professional culture, that through its alumni professional standards might be upheld and public service of the highest grade secured. His personal efforts have ceased forever, but his spirit remains to complete the work he designed."14

Although the influence of this great innovator and leader has had a profound effect upon the growth and maturation of the dental profession, he, himself, is hardly known today. When Taft died, a colleague made the cogent remark, "Several of his professional associates have suggested that the profession should erect over his grave a suitable monument which should help to perpetuate his name. This would be a very happy and fitting memorial; but whether it shall be done or not, his life has made an impression that will probably outlive any monument of stone." $^{15}$ CDA

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# Dentists Who Represent Themselves When Leasing Office Space Have Fools for Clients

Patrick J. Wood, JD, and Jason P. Wood, JD

### INTRODUCTION

The following article is designed for any dentist who is planning on leasing space, whether pursuant to a dental practice sale, renegotiating an existing lease, or entering into a lease for a brand-new office.

utting the final touches on a lease agreement you just negotiated, with what you believe are very favorable terms, is a time to celebrate. Dream office. Great location. Generous tenant improvement allowances. In fact, you're feeling great and you want to shout with glee about it. There's just one minor issue you don't know about: The landlord feels the same way. There's no wondering why the landlord feels the way he does either, since there weren't any lawyers to deal with, and the dentist thinks he essentially got everything he was after. That dentist just doesn't know it yet, but by representing himself without a lawyer representing him, problems will

Dentists should remember they treat patients. Lawyers negotiate contracts.

likely be inevitable and costly.

Once the lease is signed, you and the landlord often have opposite goals. The landlord wants the lease in effect as soon as possible so he can begin collecting rent from you, even if it's going to take three, four or even five months to "build out" the office space to your specific conditions. You just want to get into a nice, attractive new space and start running your practice. But how would you know that if a contractor lags on building out your space, he should be the one paying the rent for that extra time, not you? And neither the landlord, nor the contractor. is likely to tell you this either.

When leasing space for that dream office, you should try to gain every concession possible from the landlord so that when it comes time to pay that first month's rent, it isn't overwhelming.

If your landlord is building out the space, he will try to economize on every item, reducing his costs and increasing his net profit on top of the cash already paid to him; a lot of cash for the initial and standard five- or 10-year lease agreement. Your ultimate goals may be the same - long-term financial efficiency, but again, you are at opposite ends of the spectrum when it comes to your dream office.

If you and your attorney agree the landlord will build out the space and act as a general contractor, you should be prepared to tell him what type of cabinetry you want, whether you want berber carpeting or tile flooring, and where you do and do not want your restrooms located. You should have every detail spelled out: sinks, staff break rooms, patient waiting areas, built-in desks, areas for administrative duties, and the like. But, again, you treat dental patients. Lawyers advise clients on leases. It is sort of like asking an MD to fill a cavity, or you to perform breast enhancement surgery. Competent lawyers are the ones you should turn to when negotiating a lease because the handful who specialize in dental practice law know all the nondental items you may not know.

With lawyer in tow and you deciding to take an active role in the building





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out of your office, there are many issues and items that must be addressed.

The authors have examined the following common lease issues that most dentists don't know about when negotiating their leases.

### Office Build-Out Issues

Most leases provide the dentist with a limited time to complete the build out of their space, and the landlord will even try to start the build-out period before the lease is even signed. Therefore, you should require that the landlord have a limited time to review your plans, and you should put penalties in your construction contract so that your contractor has to pay your rent if it is not finished on time.

Another common build-out issue is the tenant improvement allowance the landlord gives you. When you negotiate the rent, the landlord will rent the space based upon the leaseable square footage, typically measured from the exterior walls of the entire unit. However, the landlord will routinely give the dentist a tenant improvement allowance based upon the usable square footage, causing the tenant improvement allowance to be 10 percent to 20 percent less than had it been based on the leaseable square footage. Always insist that the tenant improvement allowance be based upon what you are leasing, i.e., leaseable square footage.

### **Rent Increases**

Nearly all leases have rent escalation clauses, which are either contractual in nature or that are tied to one of any number of commonly used economic indexes, such as the consumer price index, cost of funds, and others you know from watching Lou Dobbs on CNN. This is what you and your landlord will be negotiating and, with any luck, your lawyer can talk him into tying such increases to one of the less volatile indexes. There should always be a ceiling on such increases, just as the landlord will insist on a floor for the same indexes.

## **Damage to Office**

Earthquakes, fires, floods, even riots are part of the landscape in California. The authors have noticed all too often in their practice that one of the victims of these calamities is the dental practice owner. The typical lease provides that if the dental lease office is damaged, the lease remains in effect if the landlord elects to rebuild but imposes no time limit on when it is to be rebuilt. Some leases even require the tenant, or the tenant's insurance company, to continue paying the rent while the office is unusable. While most of the time rent is abated, even the highly motivated landlord can have difficulty rebuilding, usually because of building permit delays (in the case of widespread destruction) or because insurance companies won't pay enough to cover the cost to rebuild. The authors have seen numerous situations where a dentist, tired of waiting for the landlord to rebuild, built out a new office at a significant cost only to have the landlord call back two or even three years later and tell the dentist he must return and start paying rent because the dentist's lease was still in effect.

The solution? Insist on having the landlord start repairs within a certain time period (e.g., 90 days) and complete the repairs by a certain date (e.g. 180 days). If the landlord fails to meet these goals, you should have the option to terminate the lease so you can move onto a new location.

#### **Subordination Clauses**

The subordination clause is an almost invisible clause in most leases because of the intricacies of the mortgage foreclosure clauses. These clauses typically require that your lease will become subordinate to any new financing the landlord places on his or her building. If the real estate bubble ever bursts, many landlords will lose their buildings as rents decrease and they can't pay the mortgage. If a lender forecloses and there is a new owner, the new landlord does not have to honor your subordinated lease, and you may lose your dental office space. However, most landlords will allow modification to these clauses during lease negotiations because they know they won't own the building if this ever becomes an issue. Therefore, always ask the landlord for a waiver of such clauses.

### **Assignment Clauses**

A typical landlord wants to control who occupies his or her space and will insert clauses that virtually destroy a dentist's ability to sell his or her dental practice.

For instance, it is common to have recapture clauses in the lease, allowing the landlord to cancel the lease if asked to assign it to the dentist buying your practice. They almost always have a clause making the lease renewal options personal in nature, so that when you try to sell your dental practice, you only can assign the lease through the current expiration date. If this is the case, the buyer's lender won't finance the sale because they want the lease to last as long as the lender's loan will be in effect (i.e., seven to 10 years). Many landlords may insert clauses that give the landlord a right to claim a portion of the profits you receive from the sale of your dental practice.

Virtually all standard form leases contain provisions which keep the original tenant on the hook for the rent through the expiration of the term, including all option periods. This occurs whether the lease specifically states this, or if the lease is silent as to when the tenant is released from liability, by operation of law. You want to ask the landlord to release you

from liability, either at the time you sell your dental practice or at the end of the current lease term so you don't remain liable throughout the entire lease term. Even if the landlord won't release a tenant at the time of assignment, they usually will allow a release at the end of the then-lease term, based on the argument that if the buyer is a bad tenant, the landlord has lease remedies which allow the landlord to deny the buyer the right to renew the lease term.

Recapture clauses should be negotiated out of leases, as should all options — personal language. Leases should not give the landlord any right to make a claim upon the purchase price you

received for your practice. You should try to obtain a release of liability to avoid the nightmare of a default occurring well after you have retired and are unable to take over the office.

These assignment clauses can destroy the nest egg you are building in a successful dental practice. This is why it is so important, whether you are buying a dental practice or building one from scratch, to have an attorney with experience in the dental field assist you with your lease negotiations.

The list of legal "do's" and "don'ts" for dentists astounds most of them when we sit down for an initial conference on selling, buying, relocating, leasing, or otherwise affecting the ownership of a dental practice.

It is often said that he who represents himself has a fool for a client. As the reader can tell from the points raised in this paper, a dentist representing himself, rather than utilizing an experienced dental attorney, can miss issues which could make their dental practice relatively worthless. With such a valuable investment as a dental practice, it obviously is in the dentist's best interest to retain the services of an expert in the leasing area.

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# Napolean's Tooth: Junk or Jewel?

If his wife ever found out he had blown the new living room suite they needed for an old tooth, there would be hell to pay.

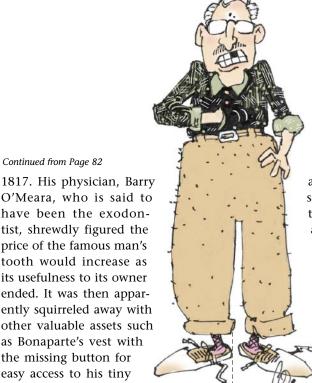
s inexplicable as the acquisition of "trout lips" by women in pursuit of the pouty look popularized by numerous entertainment personalities and Dennis Rodman, is the coveting of antiques.

An antique by any other name would not cost so much, but label a piece of junk as an "antique" and anyone can become rich if he can just guess when that piece of junk becomes a rare antique.

Case in point: Dominic Winter, an auction house in Swindon, southwest England, has just sold one of Napoleon's teeth for Understandably, for if his wife ever found out he had blown the new living room suite they needed for an old tooth, there would be hell to pay. Pity, because we know of at least 100,000 dentists who would like to have a chat with him. The dentists have on hand upwards of a million extracted teeth, any one of which could be foisted off as formerly gracing the mouth of anybody from King Tut to Marlene Dietrich.

If you can believe the authenticating papers accompanying the Napoleonic dentition, the little former French emperor gave





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O'Meara, who is said to have been the exodontist, shrewdly figured the price of the famous man's tooth would increase as its usefulness to its owner ended. It was then apparently squirreled away with other valuable assets such as Bonaparte's vest with the missing button for easy access to his tiny chest by his right hand, only to materialize 188 years later at auction. Let us hope that this one Napoleonic tooth will not lead to a disinterment to discover if any of the other 31 are up for grabs.

George Washington's dentist, John Greenwood, either restrained by higher ethical standards, or not realizing one man's defunct tooth might be another man's treasure, missed the collectible boat entirely. George was supposed to have had only one natural tooth of his own at the time he became president. Think of what this artifact would bring on the auction block today!

The mania for deceased persons' preserved parts shows no abatement. Witness Michael Jackson's attempt to own a piece of the Elephant Man and even more recently, the debacle on eBay. That bizarre event occurred when what was purported to be one of Elvis Presley's teeth was put up for bids. Not since the celebrated bidding war of 1983 when an embroidered white satin shirt with | nutty. Go figure!

authentic gravy stains and a scratch-and-sniff area emitting a certified porkchop aroma had there been such excitement! Within hours, the Elvis tooth bidding had gone well past \$1 million and was rising rapidly to something rivaling the national debt. Alarmed eBay officials, sensing a hoax, were forced to withdraw the item with its corroborating pictures from the Internet.

Dentists, logging on to witness this strange event, were much amused, because the Elvis tooth was nothing more than a molar PFM — no tooth, no roots and exactly like tens of millions of other molar PFM crowns from people you never heard of.

It was, however, the occasion for some introspection. Suppose we search our records for celebrities, real or imagined. If we have a live one, keep him or her on a rigid recall until, sooner or later, one of them loses a tooth. Do not allow the Tooth Fairy to horn in on this scenario. Hang onto this potential gold mine, keeping it safe in some glycerin and water and voila!—a hundred years from now, some pigeon will think it an honor and a privilege to pay an emperor's ransom to redeem it. Think of it. One of Johnny Carson's impacted thirds, or an original rendition of Bugs Bunny's centrals!

And we think the botox people are CDA