University of Minnesota

Dentistry

FOR ALUMNI OF THE SCHOOL OF DENTISTRY

FALL 2014

Why Do We Hurt?

It's Personal.

School of Dentistry scientists study the biological and psychosocial mechanisms that contribute to the pain experience.

Inside

from the Dean

Dear Colleagues,

Treating patients who are experiencing pain is a daily activity for most oral health professionals. The relief of pain is certainly the most singular joy in clinical dental practice. Each of us can recall patients who have presented with pain and expressed overwhelming gratitude and respect for their dental team members because we were able to diagnose the problem and prescribe and implement treatment that relieved that pain.

I, too, was once one of those grateful patients. Suffering from acute pulpitis, I endured three of hours of hell as I waited at border customs in the U.S. immigration line after a long trip home, with none of the hundreds of other people in line having the faintest idea of the pain I was enduring as my molar abscessed. Unable to use my cell phone, I could not even call the endodontist who I knew would be, on that one day, my hero.

Once through the border, I'll admit to violating more than a few traffic rules as I sped to a colleague's office. A Xylocaine local anesthesia injection never felt so good, the relief starting to settle in just minutes after the doctor administered the injection. Though anesthetized, I could feel the pressure, even the disease, exiting as my pulp was opened and extirpated.

All of us in oral health care who have had the role of that endodontist know the sense of professionalism that experience brings. That professional obligation to be able to diagnose and to perform expertly is essential to our role as healers.

As healers, we also have an obligation to understand the fundamental nature of pain. Out of that understanding will come the new treatments and the new cures for patients who are experiencing pain. In this issue of *Dentistry*, we introduce you to some of the remarkable leaders in pain research in our School of Dentistry and to the myriad of methods to attack this most vexing affliction of the human condition. They are discovering new insights into the biologic mechanisms that create the pain experience and adding to the basic body of knowledge that will eventually result in new ways to block pain signals, alter the way that the brain interprets noxious signals, or develop biochemical signaling that can prevent pain as well as treat it.

Pain is tied to—but sometimes seemingly out of proportion to—the disease that we see in our clinical examination. It is accompanied by psychological, neurologic, and social aspects that we find difficult to understand. It is a distance of just three inches from where disease in the tooth exists to where it is turned into brain signals that result in the pain experience. In those three inches, a cascade of molecular, inflammatory, and neurologic events occur that we are on the threshold of understanding. This holistic view of pain is an interface where clinicians and scientists can interact to find answers to important clinical questions.

What does it mean to be a dentist? To understand the pain experience and its neurology would seem to be key. It helps us to empathize and to interpret what we are seeing in our clinical care in a more complex and nuanced way. Yes, we perform procedures to mitigate pain, but we also strive to understand pain, how it is experienced…its underlying neurology.

At the University of Minnesota, the School of Dentistry continues to reach for new knowledge that will guide clinical care and lead to new cures and new ways of thinking about disease. A better understanding of the neurology of pain is the main pathway towards designing new treatments. When it comes to pain, the mouth is truly connected to the brain.

LEON A. ASSAEL, D.M.D.
Dean

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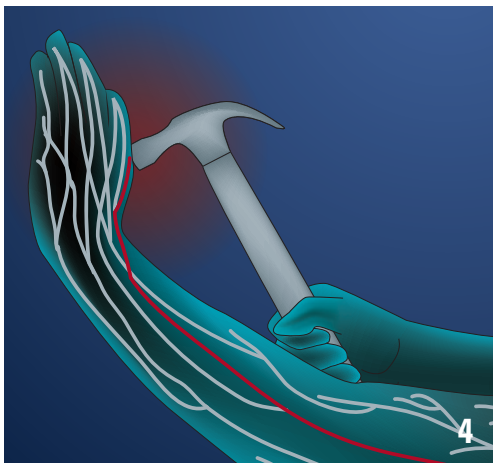

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FEATURES

IN EVERY ISSUE

FALL HIGHLIGHTS

UNIVERSITY OF MINNESOTA
School of Dentistry
Driven to Discover℠

The University's mission, carried out on multiple campuses and throughout the state, is threefold: research and discovery, teaching and learning, and outreach and public service.

Dentistry is published two times a year for the alumni and friends of the University of Minnesota School of Dentistry. We welcome suggestions and letters. Please send them to *Dentistry* magazine, School of Dentistry, University of Minnesota, 15-136A Moos Tower, 515 Delaware Street SE, Minneapolis, MN 55455 or to kante008@umn.edu. For more information about the School of Dentistry and its programs, refer to the Web site at **www.dentistry.umn.edu**.

This publication/material is available in alternative formats upon request. Direct requests to Claudia Kanter, School of Dentistry, Department of Marketing and Communications, kante008@umn.edu, 612-625-0402.

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Michael S. Sudit Receives Top Honors from University of Minnesota Alumni Association

School of Dentistry alumnus Michael S. Sudit, D.D.S. ('85) received the University's prestigious *Alumni Service Award* at a celebratory event on October 16, 2014, at the McNamara Alumni Center.

A gifted practitioner and one of the dental school's most dedicated volunteers, Sudit has worked tirelessly on behalf of students, patients and his community for 33 years.


Michael S. Sudit

As a dental student, he advocated for and created the position of student representative to the Admissions Committee. He served in that role as a student, and continues to serve on the Admissions and Diversity Committee today as a senior member and the committee's first alumni representative. Active in the mentoring and recruitment of young men and women who hope to become dentists, he also co-directed the University of St. Thomas/University of Minnesota *Pre-dental Internship Program* and welcomes aspiring dental school applicants into his practice to observe dental procedures and the dentist-patient interaction. In Sudit, these aspiring dentists find an exemplary model of professionalism and service, and many of today's practitioners carry with them the values and traditions they learned from him.

In 2012-13, he partnered with other School of Dentistry alumni and students, and with the Minnesota Twins and Minnesota Vikings, to assist *Team Smile*, an event that brings dental and sports professionals together to enhance children's health and wellness through improved oral health. He's been the team dentist to the Minnesota Timberwolves and is a regular volunteer for *Give Kids a Smile Day*. He is also the past president of *Molar Express Minnesota.*

A former adjunct professor of oral diagnosis and radiology at the School of Dentistry, Sudit also is a member of the School of Dentistry Alumni Society board of directors. He co-chaired the society's annual *Dentistry Golf Classic* for the past three years and participated in the dental school's *Student Leadership Program* (2003-06) as a presenter at Career Day, Orientation and the Senior Transitions Seminar. In his community, he served on the boards of directors for the Hopkins girls softball and youth basketball associations, the Big Willow Little League, and the Adath Jeshrun Synagogue. He's also been a clinical evaluator and/or consultant for companies such as 3M, Geodigm, IMCOR, Aveda, Guthrie Theatre, Merck Pharmaceuticals, Examworks, Evalumed, and Woodlake Medical Management.

Always thinking of how to make every committee, organization and workplace better for patients, students, faculty and office staff, his willingness to help and to 'give back' to his community, his University and his dental school has earned him the respect and appreciation of all with whom he comes in contact.

Sudit is a four-time graduate of the University of Minnesota, and the third of four generations (so far) to receive a degree or advanced degree from the University. He earned a bachelor of arts degree in child psychology and a bachelor of science degree in oral biology, a doctor of dental surgery degree, and a certificate in advanced general dentistry. Sudit maintains a private general dental practice in Minnetonka, Minn.

Dental Therapy Employer Guide Available

With grant support from the Otto Bremer Foundation, the School of Dentistry's Division of Dental Therapy led a small team of community partners in developing an online guide for dentists who want information about employing a dental therapist in Minnesota.

Designed as a go-to resource for information and answers to commonly asked questions, the site includes information about the dental therapist's education, licensure and scope of practice; collaborative management agreements; professional liability; practice settings; billing implications; and more. Visit the website at: *http://www.mchoralhealth.org//mn/dental-therapy/*.

PHOTO BY LIFETOUCH

A crowd of more than 1,000 students, their family members and friends, and School of Dentistry faculty and staff celebrated the accomplishments of University of Minnesota School of Dentistry graduates at a Commencement Ceremony held May 16, 2014, in the newly remodeled Northrop Auditorium. One hundred and seventy-eight students were recognized at the event. Included were 110 who received doctor of dental surgery degrees, 35 graduates of advanced education programs, nine dental therapy graduates, 24 recipients of a bachelor of dental hygiene degree, and two who earned a master of dental hygiene degree.

New Strategic Planning Initiative Envisions Curriculum Changes and Enhanced Rural Health Program

The School of Dentistry is moving forward with a strategic planning initiative that will provide direction for the school's education, research and service programs for the next five years.

Among the challenges being addressed in the planning process are the development of 1) new mission, vision, and core values statements for the school; 2) a strategic direction for a new curriculum model; 3) a clinical services/clinical education plan; 4) a strategic direction for the school's research initiatives; and 5) an integration of the school's strategic plan with the strategic plan, goals and objectives of the University.

A primary goal of the strategic plan is the development of a new curriculum model that will eliminate redundancies and integrate educational experiences in the basic, behavioral and clinical sciences across all years of dental education. It also will provide stronger training in general dental competencies and permit students to move into the clinical phase of their training more quickly.

This earlier move into clinics will allow for an expansion of the school's outreach requirement, from current levels of 9-12 weeks to a full academic year of pre-professional internship. It's expected that these changes will require some facilities modifications and a new model for staffing and supervising clinical services.

On September 17, 2014, more than 400 faculty, staff, students and representatives of community stakeholder groups participated in an all-school strategic planning retreat. Participants provided feedback on preliminary analyses of the school's strengths, weaknesses, opportunities and threats as they relate to the following 11 areas: school culture and environment; finances; facilities; technology; external relations; faculty and staff development; structure and leadership; marketplace; stakeholder needs and wants; products and services; and competition and partnerships.

Strategic planning workgroups incorporated feedback received from the September retreat, and a second all-school event was held October 7 to present revised recommendations.

Also, moving ahead are discussions for an enhanced rural initiative that will further expand the existing Twin Cities-based clinical program into Greater Minnesota and provide new opportunities for clinical education and patient care to be carried out in collaboration with selected community-based and rural partners.

Preliminary discussion has explored the relative strengths of current pharmacy and medical education programs now in existence on both the Twin Cities and Duluth campuses of the University. Under consideration are the following: An enhanced *Early Decision Rural* (pipeline) *Program*; an increase in the proportion of Minnesota students admitted to dental school; implementation of a career guidance service for students and dual career families; implementation of a state or regional placement service; new curriculum modules addressing issues related to life and practice in rural communities; enhanced relationships with state college and community-based education programs and services; teledentistry initiatives to extend medical and dental consultation to rural practices and emergency departments; and enhanced research focused on rural oral health needs.

Why Do We Hurt?
It's Personal.

School of Dentistry scientists study the biological and psychosocial mechanisms that contribute to the pain experience.

Pain. It's not always a bad thing. Pain is our personal security system that alerts us to possible injury and warns us that something isn't 'right' with our bodies. Pain tells us to pull our hand from a hot surface and reminds us to protect a bruise or sprained ankle. We go to the doctor when something hurts. These are all good things. But pain also has a dark side.

School of Dentistry scientists study the physical and psychosocial mechanisms that contribute to the pain experience. For a glimpse at some of the foundational research being conducted, Dentistry *Magazine talks with basic scientists David Bereiter, Julie Olson and Don Simone to learn more about why we hurt and their thoughts about how our evolving insights might translate into future treatments.*

Dentistry Magazine: Let's start with the basics. What do we know…and what don't we know about pain?

Don Simone: Well, we know a lot. But there are many mysteries.

We know that pain is not an isolated event. It's more like an *experience*…with physical, emotional and cognitive components. We know these biological and psychosocial variables account for the very real differences in people's perception of and tolerance for pain. For example, older people may have more problems dealing with pain because brain circuitry can change as we age. And men are socialized not to show or report pain. Even 'expectations' will influence how we experience pain, such as when a patient under hypnotic suggestion is able to tolerate more pain.

We also know that pain is the result of a complex process in which nerves send signals to the brain via the spinal cord. The brain and spinal cord form the central nervous system (CNS), and the signals are carried from the periphery to the brain by specialized cells called neurons. The process is not unlike the electrical system in our homes—there are signals and receptors, switches, modulators, pathways and channels, and feedback loops. But once the signal (message) reaches the brain, it's the brain that decodes and evaluates all of the information it receives from a variety of sources—including the physical, emotional and cognitive components—and determines the course of future action.

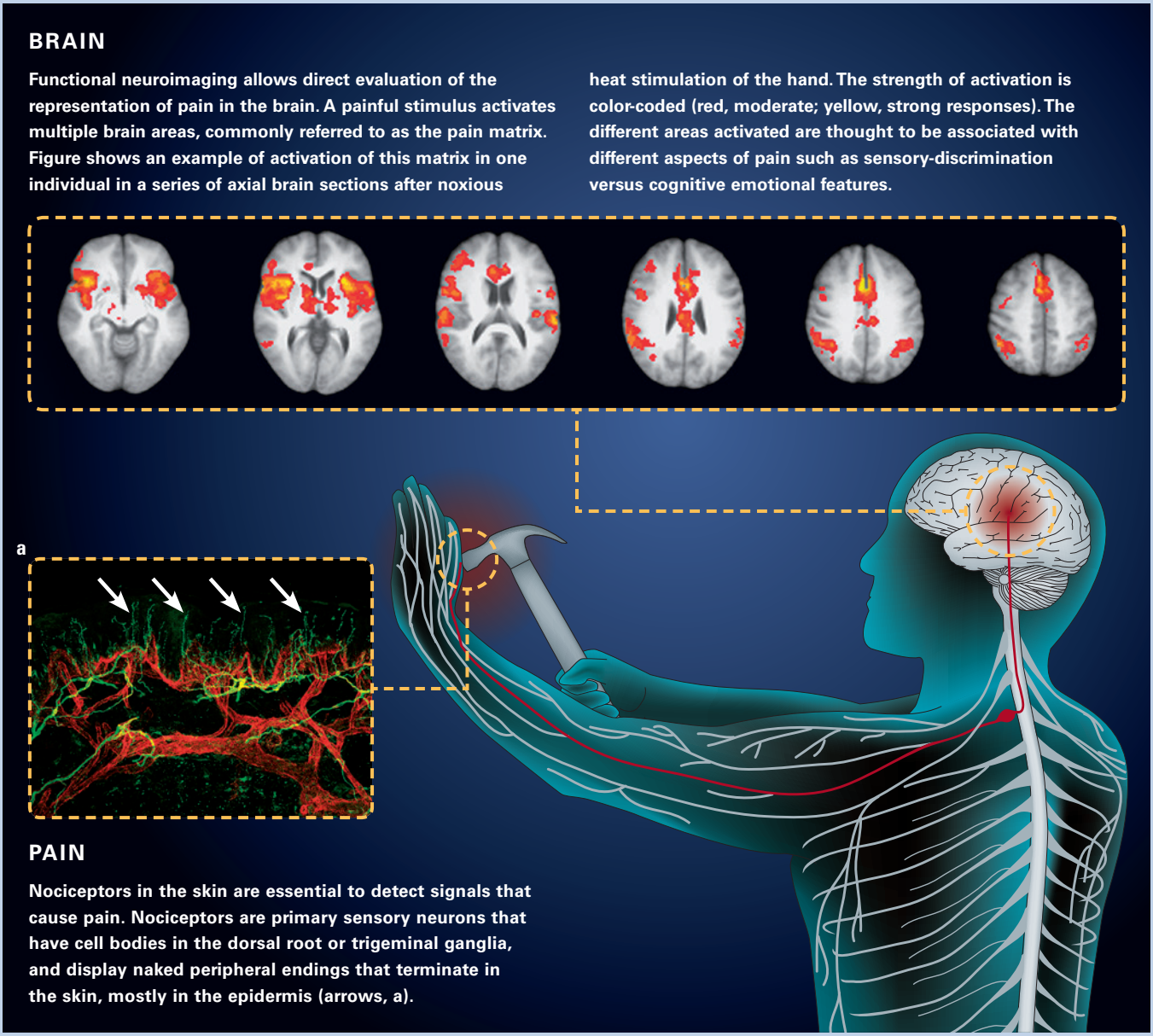
> **"We know that pain is not an isolated event. It's more like an *experience*…with physical, emotional and cognitive components."**
>
> — DON SIMONE

We also know that there are endogenous (natural) control systems within the spinal cord and the brain that will both inhibit and facilitate pain.

Julie Olson: Another thing we know is that this signaling process is a sophisticated form of communication in which our cells talk to each other. Instead of words, they send biological messages back and forth in the form of chemicals, proteins, hormones, etc. When one of these biological signals meets a receptor, information is exchanged that tells the recipient cell to take some kind of action…to turn on or off a behavior, to relay another message to a different cell, or maybe it tells the cell 'don't worry, do nothing.'

When we study this complex communication system, we find that the cells in our immune system participate in the information exchange with neurons that results in neuropathic pain.

David Bereiter: We also find that hormones play a role in modulating the pain experience. Hormones are powerful chemicals that send messages through the bloodstream that help regulate functions like growth and development, metabolism, sexual function, digestion, reproduction and mood, etc. There are stress hormones (such as cortisol, adrenaline and noradrenaline). Insulin is a hormone and so are melatonin, estrogen, testosterone, and many more. We know that hormones can both exacerbate and inhibit pain.



So, here's what might happen when you hit your hand with a hammer. Peripheral neurons in your skin first detect and then carry signals from the injured site into the spinal cord, which functions like a superhighway for messages speeding back and forth between the brain and the site of injury. Signals from these neurons get passed on (synapsed) to second-order neurons in the spinal cord. These secondary neurons connect with other local neurons in the spinal cord and send projections to higher brain centers to mediate the sensory, autonomic and emotional aspects of pain.

An example would be a soldier who doesn't feel pain from an injury until the adrenaline subsides after a battle. But hormones can also, themselves, *elicit* a pain response.

When Don said that the pain experience has a cognitive component…something else we know is that *memory* may play a role in eliciting or exacerbating pain. Soldiers with post-traumatic stress disorders, for example, can have recurring memories and when the memories come up, the pain comes up. One of the real unknowns has to do with the role of higher order processing in the pain experience. It may be that treating the *memory* of pain is an effective approach to dealing with chronic pain.

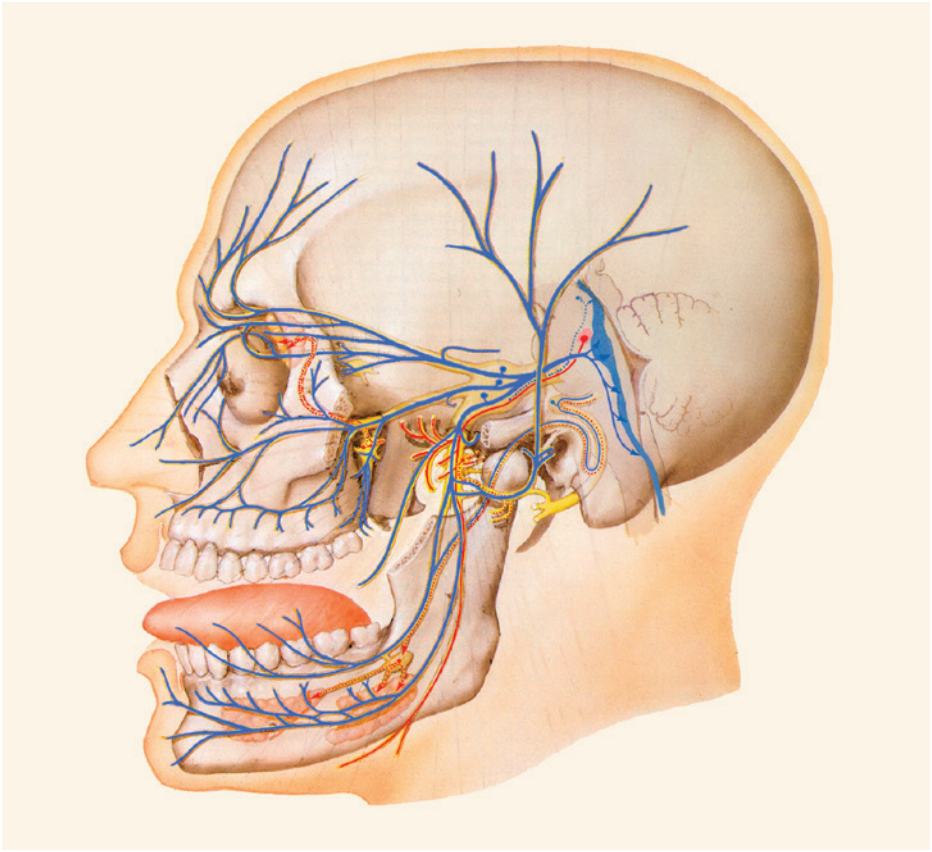
DM: What else don't we know about pain? What's still a mystery?

Simone: We know that acute pain is relatively easy to manage—even if you don't manage it well, it will go away in a relatively short time as tissue heals. Whereas we know very little about what accounts for chronic pain. We don't really know what goes on in the brain that causes pain to transition from an acute phase during injury and inflammation into chronic pain that persists months or years, even without any obvious signs of injury. We also don't understand the basics of that cell-to-cell communication—how all of those signals and receptors and pathways and synapses, etc. work together—and how the information that's shared gets processed.

Bereiter: We don't understand the role of gender differences. We know that certain painful disorders—fibromyalgia, temporomandibular dysfunction (TMD) and trigeminal neuralgia, for example—tend to affect women more frequently than men and, in the case of TMD, particularly premenopausal women. We have to believe that there must be some interaction between the role of stress and hormones, but we don't understand at what level in the brain that takes place or, at a molecular level, exactly how hormone status may influence brain synapses that control the pain response.

We don't even know what a normal brain looks like. We can image the brain of a person with chronic pain, but we don't know if we're seeing something that falls within a broad range of normal, or if there are differences that provide clues to the cause or treatment of their pain.

Olson: We also don't understand the role that our immune system and inflammatory response plays in neuropathic pain. So, for example, my research looks at the resident immune cells in the central nervous system (CNS)—called microglia—and their behavior during neurological diseases, or during neuropathic pain in the central nervous system. We know that when these immune cells are activated, they secrete several different factors, some of which promote cell survival growth and repair. It is possible that some of those secreted factors alter the neuron and trigger a pain response, which could set up a vicious loop that maintains neuropathic pain. The problem is that, once triggered, microglia cells remain active for a long time, maybe for years, even when the disease is in remission. And we do not know how to turn them off.



ADAPTED FROM *THE CIBA COLLECTION OF MEDICAL ILLUSTRATIONS, VOL. 1, NERVOUS SYSTEM,* BY FRANK H. NETTER, M.D.

The trigeminal nerve (in blue) is the largest of our 12 cranial nerves and supplies all tissues of the head and oral cavity. Sensory branches of the trigeminal nerve allow us to detect stimuli that cause touch, thermal and pain sensation.

DM: It sounds as if there are a lot of directions in which research can go. What's been the focus of the school's basic pain research?

Bereiter: In my lab, we're looking at the central nervous system and mechanisms of craniofacial pain, with particular emphasis on ocular pain and pain referred to the temporomandibular joint (TMJ) region. Our TMJ-related research looks at the influence of psychophysical stress and hormones on TMJ sensory processing at the second order neuron in the brain stem.

Head and face research is challenging because there's so much interaction from what seem to be very different tissues like the teeth, jaw and eye. However, when you look at these tissues you see they're all linked by three different branches of the trigeminal nerve, which is the body's largest cranial nerve. Head and neck pain situations are often complex because the trigeminal nerve branches converge onto a common, partially overlapping set of second order neurons in the brain. The research I'm involved in is conducted at the first stage of signal integration in the brain—at that first synaptic contact—before the information continues up to the brain.

"…our cells talk to each other.…When we study this complex communication system, we find that the cells in our immune system participate in the information exchange with neurons that results in neuropathic pain."

— JULIE OLSON

So, our dry eye syndrome research looks at the interaction between the retinal ganglion cells, the brain, and the increase in blood flow to the eye that's activated by bright light. Because there are trigeminal nerves on the blood vessels as well as in the cornea, an increase in blood flow may register as eye pain. Many trigeminal nerve fibers carrying input from the eye project onto neurons that also receive input from the dura (head)—so they may be related to headaches. And headache patients very often suffer from TMJ as referred pain.

We're also looking at the role of stress hormones in facial pain. Using a rat model, we've found that just putting

the animals into a stress condition can increase the activity of TMJ responsive neurons in the brain. We don't have to injure the joint. This fits very well with the notion of memory and cognition being an important factor in chronic pain because both elicit stress. But we don't know how much is hormonal…you can't separate hormones from brain function. They always work together.

DM: What about your research, Don?
Simone: We're studying the control systems within the brain and spinal cord that modulate pain. We also study the neural encoding of pain at the level of peripheral nerves and the spinal cord, which change after damage and inflammation to cells. We're interested in learning about the underlying mechanisms that cause hyperalgesia, which is enhanced sensitivity to pain after injury or inflammation. We have four ongoing projects, some within our lab and some with outside collaborators.

In one project, we're working with Virginia Seybold, Ph.D., in the University's Medical School, Department of Neuroscience. We're looking at how cannabinoids reduce pain by reducing the activity of the nerves that carry the pain signal from the periphery. After an injury, pain neurons are firing rapidly. And they're doing the same thing with chronic pain, too. We don't know all of the molecular biology, but we do know that cannabinoids actually work quite well to inhibit the hyperexcitability of the pain neurons and alleviate pain at the level of the periphery. We're looking at how they reduce acute normal pain, as well as pain after nerve damage or inflammation. We've been successful in alleviating cancer-related pain or pain from nerve damage caused by chemotherapy. If you can alleviate pain by putting a cannabinoid directly at the injury site, that's much better than taking a drug systemically because they can have many side effects. There's also evidence that cannabinoids may protect nerves, as well. We're not sure how that works, though.

> **"We know that hormones can both exacerbate and inhibit pain.…But hormones can also, themselves, elicit a pain response."**
>
> — DAVID BEREITER

In a separate study, we're working with William Kennedy, M.D., at the University of Minnesota Medical School (Department of Neurology) who's developing some novel devices for detecting nerve damage early in the disease process, with the idea that the earlier the identification, the better the chance of rescuing the nerves before they're permanently damaged, be that from diabetes or chemotherapy, etc.

DM: You mentioned other studies.
Simone: We have two additional studies. In one, we're trying to find out how our innate pain control systems can facilitate or make pain worse…specifically how the modulating neurons are turned on or off. To do that, we're studying the neurons in the spinal cord that become active after neurons in the medulla are turned on. The medulla is the lower half of the brainstem that's part of the pathways that inhibit or enhance pain after stress or injury.

We're able to turn those cells (neurons) on and off pharmacologically, and then we record their electrical activity. If we can learn more about that process, we might be able to activate these modulator cells ourselves…and 'turn off' the signal and reduce pain without using opioids, which right now are the best option we have for treating severe pain. But they have significant side effects. Maybe the findings could lead to the use of less toxic drugs.

Our other study is part of a multimillion dollar NIH grant to Kalpna Gupta, Ph.D., in the University's Medical School (Division of Hematology, Oncology and Transplantation), to look at the mechanisms of pain in sickle cell disease. Our studies (again) focus on the spinal cord and on peripheral nerves—in the arms, limbs, etc. What we've identified so far is that the pain neurons in the spinal cord of mice with sickle cell anemia seem to be hyperactive. And we're looking at some of the mechanisms that account for that. There's a lot more to do.

Olson: David and Don are neuroscientists, so they look at things like the brain and neurons, etc. I'm a neuroimmunologist. I study the interaction that takes place between cells within the CNS, specifically (again) between the immune cells and the neurons. We've already discussed one focus of my work. Another area of study looks at the development and progression of autoimmune disease in the CNS. We study a virus-induced model of multiple sclerosis (MS) in mice. We've demonstrated that the microglia play a critical role in the development and progression of this autoimmune disease that attacks the myelin, which is the nerve's protective covering, altering nerve impulses and promoting nerve damage. A focus of this project is to develop agents that can manipulate the microglia immune response and can be used as a therapeutic strategy for treatment of neurological diseases. An important aspect of microglia activation in MS is its possible involvement in neuropathic pain. Many MS patients experience neuropathic pain, which is often untreated.

> **"We've been successful in alleviating cancer-related pain or pain from nerve damage caused by chemotherapy."**
>
> — DON SIMONE

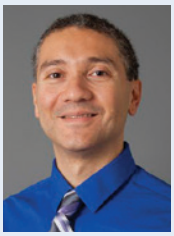
DM: There are some people who will question why this basic research goes on in a dental school?
Simone: It's not just at Minnesota. A lot of pain research is conducted at dental schools. And who's going to conduct research on pain, especially as it relates to the orofacial tissues, if it's not the dental profession?

Looking more broadly, an important reason we do basic science in a dental school is that dental education is University-based. Scientific discoveries don't typically take place in dramatic breakthroughs that have life altering impact. They take place at the day-to-day level of small insights that connect one discovery with the next. The opportunity to work in an environment that

In addition to basic science research, School of Dentistry scientists conduct translational and clinical research in the area of pain and pain management. In clinical and translational research, scientific discoveries are moved along a virtual path from the laboratory into real-world practice, leading to improved human health.

Definitions courtesy of University of Minnesota Clinical and Translational Science Institute.

Translational Research



Estephan J. Moana-Filho, D.D.S., M.S., Ph.D.
Clinical Assistant Professor
Department of Diagnostic and Biological Sciences
Division of TMD and Orofacial Pain

Clinical interests: Orofacial pain conditions, including TMD (jaw joint and/or masticatory muscle pain) trigeminal neuralgia and other neuropathic orofacial pain, atypical odontalgia, headache management; dental sleep medicine (obstructive sleep apnea, snoring, bruxism management).
Research interests: Investigation of pathophysiological mechanisms underlying orofacial pain conditions, including temporomandibular disorders, persistent dentoalveolar pain disorder (atypical odontalgia), trigeminal neuralgia; Multimodal MRI-based neuroimaging; Psychophysics; Systems neuroscience; Non-invasive brain stimulation.

Don Nixdorf, D.D.S., M.S.
Associate Professor
Director, Advanced Education Program in Orofacial Pain
Department of Diagnostic and Biological Sciences
Division of TMD and Orofacial Pain

Clinical interests: Neuropathic orofacial pain, such as trigeminal neuralgia and deafferentation pain (a.k.a. atypical odontalgia); Headache management, including tension-type, migraine, paroxysmal hemicrania, cluster and other autonomic cephalalgias; and TMD pain and jaw dysfunction.
Research interests: Investigations into the epidemiological aspects of tooth pain association with dental procedures, specifically root canal therapy; functional imaging of chronic orofacial pain conditions; classification of orofacial pain disorders; and dental MRI.

Clinical Research

Eric Schiffman, D.D.S., M.S.
Associate Professor and Division Director
Department of Diagnostic and Biological Sciences
Division of TMD and Orofacial Pain

Clinical interests: TMD and orofacial pain.
Research interests: Developing validated diagnostic criteria for the most common temporomandibular disorders (TMD), including disorders involving the temporomandibular joint (TMJ). His current funded research includes a multi-site study to determine whether progression of TMJ intra-articular disorders (disc displacements and osteoarthritis) is associated with the primary patient-reported outcomes of jaw pain, jaw functional limitation, and disability at 9-year follow-up.

brings together scientists from so many disciplines and areas of expertise allows for collaborations and shared resources that lead to those new insights and applications for our findings.

The University of Minnesota actually has a long-standing reputation for its pain research. That's one reason I came here from Oregon. My first appointment was in the Department of Psychiatry in the Medical School where I was collaborating with a dental school researcher. Eventually, I shifted my appointment to the dental school. Now, most of my research is conducted in collaboration with faculty in the dental school and medical school, both here at Minnesota and other institutions.

Olson: It's the opportunity for collaboration that helps facilitate discoveries. We all collaborate with others. I actually have a joint appointment in the College of Veterinary Medicine. When I was thinking about relocating to Minnesota with my family I liked the potential for that interaction and collaboration.

I think the research all of us do is relevant to dentistry and much more broadly, as well. We're talking about

"We study the influences and variables that make the pain experience happen. Once we understand that, the findings will have applications in the prevention and treatment of all sorts of pain conditions."

— JULIE OLSON

studying the influences and variables that make the pain experience happen. Once we understand that, the findings will have applications in the prevention and treatment of all sorts of painful conditions, orofacial conditions included.

Bereiter: I also was attracted to Minnesota by the opportunities to collaborate, in this case with the school's TMD and orofacial pain clinic.

But for another answer to your 'why in a dental school' question, I strongly

believe that a robust research program within dental schools is an important part of dental education. It demonstrates the continually evolving, evidence-based approach to teaching about how the human body works and applications of those insights to patient care. It's important, too, to provide students with the opportunity to conduct research in the dental school, or at least to gain insights into how new knowledge is generated. We do that here through the Student Summer Research Program, but I'm an advocate for even greater opportunities for all students. There are some significant scientific challenges, and we need to look to the next generation of scientists to help answer the great questions of how the human body works.

DM: Speaking of the need to develop the next generation of scientists, you all were once members of that Gen 'next.' How did you get into science? And why?

Olson: I was always interested in science. I was in fifth grade in a small town in Minnesota and told my parents I wanted to be a scientist. I'm sure they didn't quite know what to make of that, but I was just fascinated with how things worked. When I found out that there were things that I couldn't see—like viruses and bacteria—I was hooked. By the time I went to college, I knew I wanted to study microbiology, but not many universities offer microbiology degrees so I went to the University of Wisconsin, La Crosse. The program was traditionally 95% focused on bacteria, but I discovered my interest was in the other 5%…in virology and immunology. Viruses are fascinating. The virus I work with now in my MS research contains only five genes and yet it causes so much destruction.

While at LaCrosse, I had this amazing professor in the only formal immunology class I ever took. I then went on to study microbiology at the University of Iowa and found a good fit working in viral immunology, studying the chicken pox virus. The virus goes latent in the ganglia and I was intrigued about why—of all places in the body—would the virus choose to go latent in the neuron?

> **"A robust research program within a dental school is an important part of dental education. It demonstrates the continually evolving evidence-based approach to teaching about how the human body works and the application of those insights to patient care."**
>
> — DAVID BEREITER

And what is it about the immune system that would allow that to happen? So, that was the beginning of my neural interest and my fascination with the immune response.

Bereiter: I took a college course in animal physiology that intrigued me. I followed that interest into graduate work in physiology and biophysics at Illinois, which had a strong program in comparative physiology. I had great mentors, including one person who was interested in neurophysiology and environmental factors, and that's where I first thought about how sex hormones might influence sensory processing. The sensations I worked with were somatic—like touch and pain, etc. So, it held my interest and I'm still working in the field. I've always been interested in trying to understand how external neural signals lead to physiological and behavioral responses.

Simone: My experience was similar, though with a twist. I was in college, too—a psychology major at Northeastern University and was looking for a work-study job. I had my choice: I could work in the cafeteria or in a neuroscience lab. I picked the lab job and wound up studying eye movements and the parts of the brain that control them in different conditions. And that was my start. I thought anything having to do with the brain was fascinating. I came to Minnesota in 1992 and continue to investigate pain mechanisms and new approaches to relieve pain hypersensitivity.

DM: What's the next step for the school's pain research?

Don: David, Julie and I conduct what's known as 'basic' research, which can be defined as 'fundamental' or 'curiosity' research. We're investigating how things work. Ultimately, the goal is for findings to be translated and applied to patient care. There are scientists here at the School of Dentistry who are involved in these next step translational and clinical investigations. But for as much that we do know about the pain experience, there's so much more that we don't know. And I think we all share a common interest in unraveling those mysteries. ⊙

David Bereiter, Ph.D.

Professor, Department of Diagnostic and Biological Sciences, Division of Basic Sciences

Education: Doctorate–University of Illinois, Urbana in physiology with specialization in neurophysiology and postdoctoral training in neuroendocrinology at University of Geneva, Switzerland.

Julie Olson, Ph.D.

Associate Professor, Department of Diagnostic and Biological Sciences, Division of Basic Sciences

Additional appointment: College of Veterinary Medicine.

Education: Doctorate–University of Iowa College of Medicine, with fellowship in microbiology-immunology at Northwestern University.

Don Simone, Ph.D.

Professor and Chair, Department of Diagnostic and Biological Sciences, Division of Basic Sciences

Additional appointment: Department of Neuroscience.

Education: Doctorate–City University of New York. Post-doctoral training in psychophysics and neurophysiology, Yale Medical School.

Full Spectrum

There isn't a typical student at the dental school anymore.

BY RICHARD BRODERICK

Congratulations and welcome to the University of Minnesota School of Dentistry. Your hard work has paid off. Your time with us will be challenging but rewarding. You are in for an exciting journey.

Of the many milestones on the path to a career in dentistry, perhaps none is more memorable than that first day of school. An almost palpable feeling of nervousness and excitement is shared by all, including the faculty.

Although words such as intelligent, detail oriented, people-focused, caring, artistic and 'good manual dexterity skills' might be used to describe the 132 dental, dental therapy and dental hygiene students who joined the School of Dentistry's student body in September 2014, Sara Johnson knows that each student is unique. "They each have their own special story and experiences that they will bring to bear on their education and the educational experience of their fellow students, as well as on their careers and future patients," she says.

Johnson should know. For the past six years she has served as director of student affairs for the School of Dentistry. Over those half-dozen years she's seen lots of changes in the composition of this student body. As an example, she notes that among the incoming dental students, ages now range from 21 to 34. Many are in dual career marriages, some with children. They are well traveled. An increasing number of students are pursuing dentistry as their second career.

Says Johnson, "Our student body of dental, dental therapy and dental hygiene students includes record holders in Olympic-style weightlifting, competitive gymnasts and synchronized swimmers, plus aficionados of rowing, hip-hop dance, curling, biking, hiking, soccer, baseball, hockey and marathon competitions. There are students born on several different continents, and native-born students who have lived in India, England, Norway and Japan. Others have traveled around the globe. One incoming student is fluent in five languages, another spent 14 years in the military, still another is the only non-farming member of her family. There isn't a typical student at the dental school anymore."

Weston Schmidt

PHOTO BY RYAN RITCHIE

One thing that hasn't changed, though, is that the vast majority of students in all three programs come from Minnesota. Looking at just the first-year classes, 65 percent of the 100 incoming students in the doctor of dental surgery class were raised in the state. And if the past is prelude, more than 60 percent of the class—including nearly two thirds of those admitted from outside the state—will end up practicing dentistry in Minnesota.

Among the eight incoming students pursuing a degree in the relatively new profession of dental therapy, six come from Minnesota. For the incoming class of 24 dental hygiene students, 15 are from Minnesota (three are students from the region).

There are many aspects of dental education that attracts students to the School of Dentistry, but formal and informal surveys reveal that increasingly

they are interested in forming strong, supportive relationships with other students. And Johnson is quick to acknowledge that even though they are diverse in their experiences, racial and ethnic backgrounds, interests and talents, certain attributes can still be used to describe the school's students across the board. Says Johnson. "They are accomplished, goal-oriented, hard-working and extremely intelligent, but also compassionate and fun-loving."

Naty Lopez, assistant dean of the dental school's Office of Admissions and Diversity, also has seen changes in the makeup of incoming classes, including the fact that more than a third of the students are increasingly non-traditional—'traditional' meaning students right out of high school or undergraduate programs. In addition to an uptick in the number of students who are pursuing dentistry as a second career, "Many are also from families in which English is not the only language spoken," she says. And although most of the students in all three programs are Minnesotans, the school also attracts students from other states—Colorado, California, Arizona, Texas, Florida, the East Coast.

When it comes to students enrolled in the doctor of dental surgery program, especially, an increasing number are from underserved communities in Greater Minnesota—students who the school knows are likely to return to their roots after graduation and practice in their own home town or similar locations within the state. "The great majority of our students go on to practice in the state," says Lopez. Now well into the process of interviewing for the class that will matriculate in fall 2015, she notes that the School of Dentistry will increase the number of Minnesota applicants accepted to the doctor of dental surgery program with a special focus on enrolling students from rural communities.

While the majority of students accepted are biology and chemistry majors, students with non-science backgrounds—business, English, and fine arts—are also represented in the current classes.

Says Lopez, "Our admissions policies are focused on enrolling and graduating a diverse student body of thought, interest, background and intellect. Admissions decisions are based on an individualized, holistic review of each student's academic preparation and performance, DAT scores, and information provided in the application, such as community involvement and leadership experiences."

Yulianna Rodriguez

PHOTO BY SCOTT STREBLE

Although the strongest consideration is given to primary factors, no single factor is the deciding factor in the decision. This approach has resulted in students with broad interests who involve themselves in research, have strong commitments to community service and caring for the underserved, and who volunteer during their dental education programs in school, community, and student professional organizations and activities.

School of Dentistry Dean Leon Assael has been a faculty member at five dental schools. In his opinion, the student body at the University's School of Dentistry is "The most remarkable I've ever seen. What's happening today is that dentistry is morphing into a different kind of profession—and for the better," he says. "Today, it is filled with people who want to work with dental care teams. Our students are less focused on comparing themselves to others, less competitive about grades, and more oriented toward finding a rewarding balance between life and work. They are," he says, "self-motivated in the most positive way imaginable."

Weston Schmidt

Weston Schmidt, age 32, took an untraditional route to enrolling in the School of Dentistry and one of only two dental therapy education programs in the country. He studied wildlife biology and spent several years as a high school science teacher in Arizona. That's when his brother, a dentist who works in a community clinic in Ashland, Wisc., told Weston about the University's program. "So I applied and now I'm here," he declares.

"My dad worked with the DNR as a wildlife biologist," explains the native of rural Wisconsin of the decision. "So I started on that path early, worked on it quite a while and finished it early. I enjoyed doing that and teaching. But I felt I was not helping people as I wanted to do—not helping them as much as I could."

Like many dental school students, Schmidt is active in more than classes and career planning. Among other things, he is one of the student members of the school's strategic planning committee, charged with developing a five-year plan for the School of Dentistry. He also serves on a curriculum advisory committee for the dental hygiene program; dental therapy students take several classes required to become a dental hygienist.

After graduation, Schmidt intends to work somewhere in northern

Minnesota. He is enthusiastic about the key role he could play in a dental practice.

"Dentistry is about a team-based approach to care," he observes. "That places less responsibility on one person. The medical field has gone down this path and it has worked out well. Somebody like me can take on a lot of the technical work and open up time for a dentist to focus on more advanced procedures."

Erin Belling

PHOTO BY SCOTT STREBLE

Yulianna Rodriguez

"I always knew I wanted to work in health care," says Yulianna Rodriguez, a 25 year-old native of Chicago whose parents migrated to the United States from Mexico. Initially, Rodriguez considered taking a degree in nursing, but then decided that a career as a dental hygienist was right for her.

Back home, she received certification as a dental assistant. After working for awhile for a local dentist, she began to apply to dental hygiene programs in Chicago. "I always knew there was more to know and that additional learning would make it possible for me to provide patients with even better oral hygiene and preventive care," she says.

It turned out, however, that Chicago-area schools only offered associate degrees in dental hygiene. "When I saw that the University of Minnesota offers a bachelor's degree program and that the school is located in an urban area, I knew this was the place for me," she says.

At the moment, Rodriguez, who teaches Bible-study classes in her spare time and also has volunteered with Give Kids a Smile Day, isn't sure whether she will return to Chicago after she's done with her schooling or remain in Minnesota.

"My former employer wants me back so I have a job lined up if I return to Chicago," she says. If she stays in Minnesota, she plans to work as a dental hygienist while continuing her quest for knowledge and service.

"Eventually my goal is to teach," she says. "We'll just see how everything works out."

Erin Belling

On the one hand, Erin Belling is a kind of legacy dental student. Her father, Lyle Belling (D.D.S., 1970) is a University graduate and practiced dentistry in his daughter's hometown of Belgrade, Minn. for 40 years before retiring and selling his practice—the only one in that small community—to a husband-wife team of dentists, themselves graduates of the University. She is, therefore, exactly the kind of student you'd expect to choose dentistry as her career.

But there's another side to her story, one that reflects the diversity and wide-ranging interests of the school's student body. After obtaining two undergraduate degrees in 2005 and 2006, one from the Carlson School of Management, the other in visual art, she spent several years working in marketing, management, website development, and graphic design. Her passion for the health sciences drove her to pursue additional education, and she set her sights on becoming a medical illustrator. While working full time and taking evening courses in the biological sciences, she had a change of heart.

"The more I got into my health science coursework, the more I wanted to apply that knowledge clinically. It turned out that after a lot of exploration that dentistry was the perfect fit," recalls Belling, who, in addition to classwork, has also found time to serve on the school's strategic planning committee and as an officer of the Women's Dental Association.

"I see a real connection between art, design, business, and dentistry," she declares. "I love working with my hands and creating things, so the visual and tactile overlap is obvious. However, for me, the real line of continuity between all of these disciplines is communication. Presenting ideas in ways that are compelling, understandable, and compassionate—that will be my key to patient care."

Research opportunities at the University were another draw for Belling, a former participant in the dental school's summer research program, where her work focused on opioid abuse. She is also excited about the school's commitment to diversity.

"Our patient populations are diverse, and when I look at my classmates and colleagues, I know that our dental workforce will reflect that," she says. "Dentistry is an amazing profession, and I love seeing more and more people of different genders, cultures, ages, and backgrounds drawn to it."

And then there's that strong legacy connection she feels with her father. "Dentistry is an incredible thing to have in common. Both he and my mom are so happy for me. Even though I'm a bit older than the traditional dental student, love and support from my parents still makes all the difference." ⊙

Muriel Bebeau Receives Century Club Professor of the Year Award

PHOTO BY SCOTT STREBLE

Muriel Bebeau

Muriel Bebeau, Ph.D., (Primary Dental Care-Dental Public Health) was named the *2013 Century Club Professor of the Year*. The award is the school's highest honor, presented annually to recognize one faculty member's outstanding contributions in education, research and service.

Bebeau was recruited to the School of Dentistry in 1979 to direct a national Dental Quality Assurance Curriculum Project. As the project unfolded, so did the profession's interest in ethics instruction. Aware of the advances in moral psychology led by James Rest in the University's Department of Educational Psychology, Bebeau worked with dental faculty to secure funding that brought together psychologists, philosophers, community dentists and students to develop sophisticated tools to assess ethical sensitivity, ethical reasoning and judgment, moral motivation/identity formation, and moral implementation.

The resulting evidence-based approach to teaching and assessing ethical development in dentistry led to 25 years of continuous training for more than 2,000 University of Minnesota dental students who met one-on-one with American College of Dentists (ACD) fellows for feedback on ethical problem-solving in dental practice. ACD honored this work when she was inducted as an ACD honorary fellow (1986) and, in 2007, she accepted the national achievement award from the ACD on behalf of the Upper Midwest Section. The award recognized Minnesota's approach to ethics curriculum, including the long term involvement of Minnesota dentists in the validation of outcome measures and the longstanding collaboration with ACD fellows. Concurrently, she worked with the Minnesota Board of Dentistry, to mentor sanctioned professionals, gathering data to identify deficiencies in ethical abilities that could be remediated with lasting effects.

In addition to teaching, Bebeau also has advised doctoral students in educational psychology and numerous predoctoral and summer research students. With James Rest, she founded the Center for the Study of Ethical Development at the University of Minnesota (1982), serving as director from 2000-2008. She also was instrumental in establishing the University's Center for Bioethics (1985). She's served on numerous University and School of Dentistry committees, chairing the Academic Health Center (AHC) Faculty Consultative Committee (FCC) and serving on the University FCC and the AHC Research Ethics Planning Committee.

Her work also includes contributions to medicine, professional psychology, legal education, and integrity in scientific research. A highly regarded presenter both nationally and internationally and for both dental and non-dental audiences, her research on the teaching and assessment of ethical development is described in numerous publications, including the Institute of Medicine's 2002 report *Integrity in Scientific Research: Creating an Environment that Promotes Responsible Conduct* (RCR). Her work on RCR education was enriched by her experiences as Chair of the Ethics Committee for the American Association for Dental Research.

Bebeau's research and publication awards also include the prestigious Kuhmerker Lifetime Achievement Award from the Association for Moral Education (1989), the American Educational Research Association (AERA) Outstanding Research Publication Award (2000) for "Postconventional Moral Thinking: A Neo-Kohlbergian Approach" (with Rest, Narvaez and Thoma), and the U.S. Army's Meritorious Civilian Service Award (2003) for curriculum work on character and leadership development at West Point. Her work with James Rule on professional identity formation is summarized in her book *Dentists Who Care: Inspiring Stories of Professional Commitment*. Bebeau also served on an American Psychological Association task force on competence assessment (2005), on the Professionalism Committee of the Minnesota State Bar Association (for eight years), and she has been an invited contributor and presenter in legal publications and forums.

Her most prestigious award—Fellowship in the American Educational Research Association, awarded in 2011—places her among America's most influential educational researchers, recognized for exceptional scientific and scholarly contributions to educational research and development.

Bebeau earned both a master in education and a doctorate in educational psychology at Arizona State University.

It Was a Grand Turnout

The School of Dentistry celebrated its 125th anniversary with a Gala dinner and reception on Friday, October 24. More than 300 people joined Dean Leon Assael, School of Dentistry Alumni Society President Thomas Smyth, and University of Minnesota President Eric Kaler at the McNamara Alumni Center for the festivities. The evening featured a video highlighting 125 years of School of Dentistry accomplishments, plus comments by guest presenter American Dental Education Association President Richard Valachovic. The event also kicked off the *125th Anniversary Fund*, which will raise funds to support strategic initiatives identified by the dental school. *Visit our website at* ***www.dentistry.umn.edu*** *to see the video, hear the presentations, view photos, and/or to make a donation.* ⊙

PHOTOS BY RYAN RITCHIE



Research Publications


Sven-Ulrik Gorr

We recognize our colleagues for their contributions to the body of knowledge that forms the foundation for our profession.

The faculty, staff, students and research fellows of the School of Dentistry published 132 articles in scientific and professional journals between August 2013 and July 2014. These articles report on investigations—in areas of basic, clinical, and social and behavioral sciences, and public health—by collaborating authors from all departments within the dental school and a variety of academic and scientific institutions.

This breadth of scholarship is a testament to the vitality of the School of Dentistry's research programs and the extensive collaborations occurring within the school and with scientists around the world.

The publication list is organized by department and division. Publications co-authored by collaborators in several divisions are acknowledged in each participating division.

Sincerely,

SVEN-ULRIK GORR, PH.D.

Department of Developmental and Surgical Sciences

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AlumniNews

A Letter from the President

It's been a grand year. This fall, the University of Minnesota School of Dentistry brought to a close a celebratory year marking our 125th anniversary. I can't help but wonder about those first few years. It takes energy and commitment to re-envision the known and launch the future. Who was here to provide that energy? Who sacrificed? It is also natural for people to resist change—what arguments and efforts were made for and against creating this new school at the University?

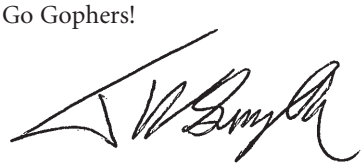
While reviewing aged dental journals, I found that the National Association of Dental Examiners held its Eighth Annual Session in 1989. It was the first time the association approved a program at the "College of Dentistry, Department of Medicine, University of Minnesota." This was one of only 28 U.S. dental education programs listed as "Recommended as Reputable by this Association." At the time, graduating from one of these 'reputable' schools showed a significant difference and legitimacy in the training of a dentist, as compared to those who had not attended such a program. On the same list of 28, two other dental training programs were recognized, but with an additional note that they were now 'defunct' or recently closed. These were the Minnesota Hospital College Dental Department, Minneapolis, and St. Paul Hospital College, Dental Department, St. Paul. These two programs closed at the same time the program at the University of Minnesota opened. Think of that—of the 28 accredited dental education programs in the entire United States at the time, three were from the Gopher State! The next year, 1890, saw the institution's faculty accepted into the National Association of Dental Faculties at its annual session in Excelsior Springs, Missouri. William Xavier Sudduth, M.A., M.D., D.D.S. accepted admission into the association on behalf of the college's educators in front of the greatest minds in dentistry at the time.

Dr. Sudduth was one of the driving forces of the new school. The Illinois native, who received his dental training in Philadelphia, had first served as secretary of the dental college. He went on to hold many positions in the early days of the institution, including that of the first chair of oral surgery (serving until 1894), and dean of the school from 1892-1895. When he passed away in 1915, the *Western Dental Journal* listed his obituary on the same page and above G.V. Black's, while noting the passing of major contributors to dentistry.

On behalf of your School of Dentistry Alumni Society, it is our hope that we make pioneers like Dr. Sudduth proud as we begin our *next* 125 years. Each day as we practice, research or teach our craft, let us remember and be grateful for those individuals who took a chance and poured their focus and their energy into this new idea of a University-based form of dental education. Let us also celebrate! We invite you back to campus for an evening session of Grand Rounds—where you will also see and have the chance to meet some of the current students. Always feel welcome to participate at state or ADA convention receptions, as well as Homecoming festivities. Our School of Dentistry Alumni Society is continuing its strategic planning initiative in our effort to provide an increasingly focused and strong society for our members. If you are interested in serving on the Board of Directors or know someone who would be a strong candidate, please contact Emily Best at **emilyj@umn.edu**. Also, don't forget there is the opportunity to aid our current students by participating in the Cap and Gown Graduation Fund every spring!

Thank you for your support of the University of Minnesota School of Dentistry.

Go Gophers!



THOMAS SMYTH, D.D.S. '00
President, School of Dentistry Alumni Society
www.dentistry.umn.edu/alumni

Time for a Class Reunion?

The Alumni Office can help. Contact Emily Best (612-625-6811 or emilyj@umn.edu) to request current mailing labels for your classmates, promote your reunion via email, and receive Gopher spirit items and prizes for your event.

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ON LINKEDIN AND FACEBOOK.

University of Minnesota
School of Dentistry

Alumni Society Golf Classic

The School of Dentistry Alumni Society's 20th Annual Golf Classic was held on July 25, 2014, at Majestic Oaks Golf Club in Ham Lake. Sixty alumni, students and sponsors spent the morning vying for top honors in this best-ball tournament. Many thanks to all of our sponsors, with a special thank you to Accelerated Practice Concepts and Baker Tilly Virchow Krause, LLP, who were *Tournament Sponsors*. Proceeds from the golf tournament will benefit alumni society-supported initiatives, including scholarships, *Give Kids a Smile Day,* student/alumni learning opportunities, and affordable continuing dental education. A very special thank you to this year's co-coordinators Mark Bachman ('00), Mike Sudit ('85) and Cindy Sundet ('85), without whom we could not have had such a successful tournament.

Congratulations to the following contest winners:

SPECIAL AWARDS:

Men's Long Drive: Kevin Liberko

Women's Long Drive: Mary Owen

Closest to the Pin: Charlie Hannon

Longest Putt: Marty Borchardt

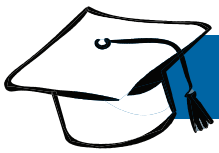
TOP THREE TEAMS:

Team 1: Joe Becker ('83), Ron Barthell, Bob Proebstle, Ron Szarzynski

Team 2: Andrew Bosworth (D3), Ted Dyste, Ben Englund (D3), Adam Erickson (D3)

Team 3: Travis Bjordahl (D3), Clayton Conroy (D3), Thomas Jordan (D3), Kevin Liberko (D3)

The Winning Foursome



Hats off to you!

Through the generous support of the donors listed below, the Class of 2014 once again received the gift of their caps and gowns in recognition of their graduation from the School of Dentistry. Underwriting the cost of caps and gowns has been a tradition of the School of Dentistry Alumni Society since 1997. Under the direction of alumni society board member Kim Johnson ('79), the request for support went out last spring and an overwhelming 211 people and practices responded. On behalf of the alumni society and the Class of 2014, thank you!

A. Richard Ballin, DDS
ABC Pediatric Dentistry
Ms. S. Kaye Adams
Dr. Laura A. Aeschlimann
Dr. William S. Akey
Albert Lea Dental Care
Mrs. Jeanne M. Anderson
Mrs. Roberta J. Anderson
Andrew De La Garza Jr., DDS, PA
Dr. Kirsten Andrews
Arnold Orthodontics, PA
Dr. Wendy Ziman Bach
Mark W. Bachman, DDS
Dr. Bashar Bakdash
Dr. Carl L. Bandt
Dr. Joseph S. and Ms. Sarah M. Basile
Ms. Marie A. Baudek
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Dr. William S. Becker
Dr. Bruce R. Beier
Drs. Stephen A. and Elizabeth R. Bejarano
Drs. William J. and Kathleen E. Bellamy
Dr. Michael A. Bender
Douglas T. Bengson, DDS
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Dr. David K. Dungey
Ms. Emily U. and Dr. Scott H. Durand
Dr. Frederick C. Eichmiller
Drs. Laura M. and Robert E. Eng
Dr. Jerome A. Erickson
Dr. Roger G. Ettel
Dr. Raymond W. and Mrs. Susan C. Evans
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Dr. Gerald L. Fields
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Mr. Ronald J. and Rita K. Garni
Dr. Joseph A. Gibilisco
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Dr. Thomas H. Inglis
Dr. Robert J. Isaacson
Dr. Ebun-Oluwa S. Isawumi
James Spitzmueller, DDS, MSD, Ltd.
Dr. Lisa D. Cashin Jernell
Dr. Lee D. and Mary J. Jess
Dr. Dennis A. Johnson
Dr. Owen W. Johnson
Ms. Kimberly S. Johnson
Johnson Family Dentistry
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Dr. Kristy Lappinga
Dr. Matthew E. Larson
Larson Orthodontic Specialists, LLC
Dr. Ignatius K. Lee
Ms. Patricia A. Lenton
Dr. Julie M. Lesher
David Linde, DDS
Dr. Kimberly A. Lindquist
Dr. Scott D. Lingle
Dr. David and Mrs. Betty Sue Lipschultz
Dr. Stephen F. Litton
Dr. Gloria E. Lopez Franco
Dr. Jerald H. Lyng
Dr. William C. Manke
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Drs. Candace Mensing and Robyn Loewen
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Dr. John L. Mike
Dr. Michael J. Monti
Drs. Randall D. and Julie A. Moseng
Dr. Gregory W. Nelson
New Art of Dentistry
New Horizons Dental, LLC
Nicholas C. Dorsher, DDS, Ltd.
Dr. James D. Nickman
Nicollet Station Dental, PA
Dr. George M. and Ms. Margaret L. Noesen
Dr. Frederick Nolting
Dr. John C. Ofstehage
Dr. Richard C. Oliver
Dr. Lynne M. Olson Rommesmo
Dr. David M. Oltmans
Drs. Jo Ann and Mark R. Omlie
Dr. Gina L. Pfeiffer
Dr. Thomas J. Pink
Ms. Maria R. Pintado
Pitzer and Kline Dentistry P. C.
Dr. Mercedes Lucerne Porter
Prairie Ridge Orthodontics
Range Family Dental
Dr. Kimberly A. Rauk
Dr. Carmen Conceicao Dias Real
Regional Dental
Roger G. Ettel, DDS and Associates, PA
Rogers Dental Center
Dr. Jeffrey A. Rohrer
Dr. Michael D. Rohrer
Dr. James D. Rostvold
Dr. William R. Sabes
Sandstone Dental Office, Ltd.
Dr. Alan F. Schneider
Dr. Stephen N. Schwartz
Dr. Robert C. and Mrs. Inez L. Schwegler
Dr. Thomas R. and Mrs. Julie D. Seidelmann
Dr. E. Kent Shirley
Dr. Stephen K. Shuman
Dr. Heather L. Skari
Smile Solutions PC
Dr. Drew F. Spencer
Dr. James E. Spitzmueller
St. Paul Dental Center, LLC
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Dr. Jerald A. Yoneji
Lisa Young, DDS
Dr. Darrell M. Yunk
Dr. Barbara L. Zajicek
James K. Zenk, DDS

Class Notes

Please submit brief notices about milestone events and activities to: U of M School of Dentistry, Alumni Relations (attn: Emily Best), 515 Delaware St. S.E., 15-136 Moos Tower, Minneapolis, MN 55455 or emilyj@umn.edu.

Dentistry is published two times a year. Deadlines for submission are: Spring issue: January 1; Fall issue: July 1. Please note: *Dentistry* cannot publish birth and marriage announcements.

1947

John Herseth (D.D.S.), Bellingham, Wash., died on July 18, 2014. After serving as a dentist in the military for seven years, Herseth began his dental practice in Bothell, Wash. in 1954.

1965

Robert May (D.D.S.), Plymouth, Minn., died on July 20, 2014. May was a former team dentist for the Minnesota North Stars from 1968-1983 and a head coach for the University of North Dakota men's hockey team, leading them to their first national title in 1958-59. He also invented the first custom-fit mouthpiece for hockey players.

1967

Frederick Groth (D.D.S.), Lakeville, Minn., died on April 28, 2014.

1970

William Greg Lawton (D.D.S.), Orono, Minn., died on May 24, 2014 at age 67. He practiced general dentistry in Wayzata, Minn., and was a contributing member of the Pankey Institute since 1979, a past-president of the Minneapolis District Dental Society (2007-08) and a board member of the School of Dentistry Alumni Society (2009-12).

1971

Dennis McGuire (D.D.S.), Waukegan, Ill., died on August 11, 2013. He served as a captain in the U.S. Navy Dental Corps for 35 years and retired in 2002.

John H. Warford (D.D.S.), Bismarck, N.D., was appointed dean of the Gary Tharaldson School of Business at the University of Mary (Bismarck) in January 2014.

1974

Kim Chart (D.D.S.), Duluth, Minn., retired in December 2013 after almost 39 years of private practice. He taught at the University of Minnesota School of Dentistry after graduation and before joining his father Marcuis Chart (1953) in private practice. Chart served on the Minnesota Dental Association Dental Education Committee and the Lake Superior College Healthcare Advisory Board.

1976

A literature review published by **Jill Stoltenberg**, B.S.D.H., M.A., R.F., Minneapolis, Minn., (with co-authors Sarah Graumann, M.D.H., and Michelle Sensat, R.D.H., M.S.), was published in the August 2013 issue of the *Journal of Dental Hygiene* and referenced three times as part of an international (U.S. and Canada) webinar held in June on new developments in air polishing. Stoltenberg is currently a faculty member at the School of Dentistry in the Department of Primary Dental Care, Division of Dental Hygiene.

Jill Stoltenberg

1980

Jan Jachimowicz (D.D.S.), Eden Prairie, Minn., was a Minnesota Cup semifinalist in the Energy/Clean Technology/Water Division for his work with AquaMedix LLC. The Minnesota Cup is the largest statewide new venture competition in the country. The semifinalists competed for a share of $300,000 in prizes, as well as the opportunity to make their entrepreneurial dream a reality.

1985

Kevin Dens (D.D.S.), Baxter, Minn., was named *2014 Brainerd Citizen of the Year*. With a long-time commitment to his community and profession, Dens is a member of the Kiwanis Club of Baxter, the Essentia Health-St. Joseph's Medical Center Board, and was formerly involved with Brainerd Jaycees, Camp Confidence, and Brainerd Community Action. He is currently the second vice president of the Minnesota Dental Association and will serve as the association's president during the 2016-2017 term. Dens joined his father-in-law Thomas Kotula (D.D.S. ('54) in dental practice in 1986. Kotula was the recipient of the same Brainerd Citizen of the Year Award in 2006.

Peter Jorgenson (D.D.S.), Willmar, Minn., was recognized as an associate fellow of the American Academy of Implant Dentistry at its 2010 Annual Meeting. Jorgenson is one of 514 members and one of just four dentists in Minnesota to be so recognized.

1992

Kimberly A. Lindquist (D.D.S.), Duluth, Minn., was appointed to the Board of Directors of the American Association of Endodontists for 2014-2015. As director for District VI, she represents Alaska, Colorado, Hawaii, Idaho, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming, and Guam. A diplomate of the American Board of Endodontists, Lindquist is president of the Northeastern District Dental Society and past president of the Minnesota Association of Endodontists. She completed her certificate in endodontics and master of science in dentistry from Case Western Reserve University.

1995

Class Reunion: Plans are underway for a class reunion on Friday, April 24 at 6:00 p.m. at Sally's Saloon. Contact Kirk DuLac for more information: kdulac@ealmn.com or 763-427-1720 or 952-250-8269.

1997

James Nickman (D.D.S.), Lino Lakes, Minn., was appointed secretary-treasurer of the American Academy of Pediatric Dentistry (AAPD) at its annual session in Boston on May 27, 2014. He has been a member of the AAPD since 1999 and a diplomate of the American Board of Pediatric Dentistry since 2002. Nickman currently serves as the public policy advocate for the Minnesota Academy of Pediatric Dentistry (MAPD). As a past-District IV Trustee of the AAPD, he served as liaison to the Council on Government Affairs, Council on Dental Benefit Programs, the Committee on the Adolescent and the Council on Membership, and he is an AAPD national spokesperson. Additionally, he is the past president of the Minneapolis District Dental Society and serves as the chair of the Minnesota Dental Association Barriers to Care Committee and as a member on the MINDENPAC Board. He also is the past-president of the North Central Society of Pediatric Dentistry, Minnesota Academy of Pediatric Dentistry, and the University of Minnesota School of Dentistry Alumni Society. He is a fellow of the AAPD, the American College of Dentists, the International College of Dentists and is a member of the Pierre Fauchard Academy. Nickman maintains a private practice in the Twin Cities and teaches part-time at the University of Minnesota. He completed his pediatric dentistry residency at the University of Minnesota School of Dentistry in 1999.

James Nickman

2000

Aaron Cruthers (D.D.S.), Racine, Wisc., was elected to the American Academy of Implant Dentistry as an associate fellow at the Academy's 2014 Annual Business Meeting in Orlando, Florida in November.

Sean Tarpenning (D.D.S.), Eau Claire, Wisc., is one of several local celebrities who participated in the sixth annual Dancing With the Eau Claire Stars event in September raising $34,000 for the Eau Claire Children's Theatre.

2001

Tanner McKenna (D.D.S.), Sun Prairie, Wisc., received the Academy of General Dentistry's (AGD) Fellowship Award during the AGD 2014 Annual Meeting and Exhibits in June 2014 in Detroit. The award required that McKenna complete a minimum of 500 hours of continuing dental education, pass a comprehensive written exam, and fulfill three years of continuous membership in the AGD.

2004

Melissa Drum (D.D.S.), Columbus, Ohio, received the American Association of Endodontists Edward M. Osetek Educator Award, which is presented to a full-time educator with fewer than 10 years of teaching experience who has earned the esteem and respect of students and faculty associates. Drum received her Certificate in Endodontics from The Ohio State University in 2006. She is currently a tenure-track faculty member and director of the pre-doctoral endodontic program at The Ohio State University.

A literature review published by **Sarah Graumann** (D.H.), Minneapolis, Minn., with co-authors Michelle Sensat, R.D.H. M.S., and School of Dentistry faculty member Jill Stoltenberg , B.S.D.H., M.A., R.F. (Dept. of Primary Dental Care, Division of Dental Hygiene), was published in the August 2013 issue of the Journal of Dental Hygiene (2013) and referenced three times as part of an international (U.S. and Canada) webinar held in June on new developments in air polishing. She received her Master of Dental Hygiene degree from the University of Minnesota in 2011.

2011

Zachary Lechner (D.D.S.), Stewartville, Minn., recently opened Root River Dental in Stewartville. Lechner purchased the practice from Lee Weinhold '73 (D.D.S.) who retired after practicing for 41 years.

2014

Christopher Dens (D.D.S.) practices dentistry at Cosmetic & Family Dentistry in Baxter, Minn.

Tricia Marheine (D.D.S.) practices at Advanced Family Dental in Albert Lea, Minn.

Bronson Schelling (D.D.S.) has joined Dentists of Owatonna in Owatonna, Minn.

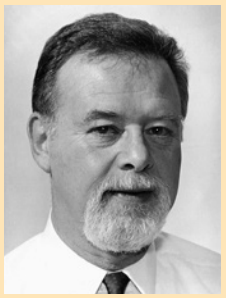
Remembering Our Faculty

We share this news of the passing of a former faculty member. Obituaries of faculty who are alumni of the University of Minnesota School of Dentistry are included in Class Notes.

Harvey L. Colman

Harvey L. Colman, (D.D.S., M.S.D.), Shelburne, Vt., died on May 22, 2014. Colman joined the University of Minnesota School of Dentistry faculty in 1978 as associate dean for clinical affairs and professor in fixed prosthodontics, and continued in these roles until 1988. He also was acting chair of the Department of Oral Diagnosis and Oral Radiology (1979-80) and acting chair of fixed prosthodontics (1983-7).

Known as a superb clinical dentist and a productive lecturer and contributor to the literature, he was instrumental in introducing the group-clinic system to the school's clinical education program and made impressive contributions to clinical dentistry, organized dentistry, and the American Association of Dental Schools (AADS). He was active in the AADS as chairman and/or program chair of section committees related to clinic administration and fixed prosthodontics, and was member of the Council of Faculties (1974). He also was a consultant on clinical sciences for the Commission on Dental Accreditation (1980-1986), a member of the Editorial Review Board of the *Journal of Dental Education* (1981-84), the Grant Application Review Panel for the American Fund for Dental Health (1982-88), and was a fellow of the International College of Dentists and the American College of Dentists. Colman earned his D.D.S. from the University of Southern California and an M.S.D. from the University of Washington, with a certificate in restorative dentistry/fixed prosthodontics. He also earned a certificate in periodontics from USC in 1968, where he chaired the Department of Fixed Prosthodontics (1968-74) and served as assistant dean for student affairs (1971-74) and associate dean for clinical affairs (1974-77).



Burton L. Shapiro

Burton L. Shapiro, (D.D.S., M.S.D., Ph.D.), St. Paul, Minn., died on August 9, 2014 from complications of amyotrophic lateral sclerosis (ALS, Lou Gherig's Disease). He was 80 years old.

A dedicated teacher and scientist, Shapiro came to the University of Minnesota on an American Cancer Society fellowship, the second ever given to a dentist at that time. In 1964 he joined the School of Dentistry faculty as an instructor in the Division of Oral Pathology, and was named associate professor of the division in 1966. He directed the Oral Biology Program in 1968, and was named professor and chair of the newly formed Division of Oral Biology in May 1970.

While on faculty, he created the first required medical genetics course in a dental school that he taught annually from 1963-2003. He mentored more than 30 dental students and post-doctoral students in his laboratory and served on numerous University of Minnesota committees, including two terms on the University Senate. The dental school honored him with its *Century Club Professor of the Year* award in 1987.

But Shapiro was first and foremost a scientist, with research interests in the areas of cleft palate, cystic fibrosis and down syndrome. He was the first to demonstrate that programmed cell death was involved in cleft palate, and was senior author on a book about cystic fibrosis in 1989. He also was the first to identify 'amplified developmental instability' as the cause of down syndrome. His theory has influenced environmental biology since that time and his article has been cited in more than 500 scientific papers and used to describe a basis for carcinogensis. A dedicated researcher who challenged conventional dogma and searched for the truth, he wrote 118 scientific manuscripts and served as visiting faculty member internationally, most notably in Japan, Russia, China, Greece and Israel.

Shapiro graduated from Tufts College with a degree in psychology and earned his doctor of dental science degree from New York University. He then served as an endodontist in the Navy. At the University of Minnesota, he received a M.S.D. in oral pathology and a doctorate in genetics.

In his memory, Dr. Shapiro's family established the Dr. Burton L. Shapiro Memorial Lectureship in the School of Dentistry.

EventsCalendar

JANUARY 2015

January 22
School of Dentistry Alumni Society (SODAS) Board Meeting
School of Dentistry
University of Minnesota
Minneapolis Campus
Minneapolis, Minn.

For information:
(612) 625-6811

FEBRUARY 2015

February 7
School of Dentistry Give Kids a Smile Day
University of Minnesota
School of Dentistry
Minneapolis, Minn.

February 27
11th Annual Dental Research Updates from the U of M
Great Hall
Coffman Memorial Union
University of Minnesota
Minneapolis Campus

February 28
University of Minnesota Day in Arizona
The McCormick Scottsdale
Phoenix, Ariz.

MARCH 2015

March 1
School of Dentistry in Arizona—Alumni Brunch
Location: To be determined

For information:
(612) 625-6811

March 11-14
International & American & Canadian Associations for Dental Research (IADR/AADR/CADR) Annual Session
Location: Boston, Mass.
Reception: TBA

March 27-28
25th Annual Daniel E. Waite Lecture

For information:
(612) 624-7133

APRIL 2015

April 16
School of Dentistry Alumni Society (SODAS) Board Meeting
School of Dentistry
University of Minnesota
Minneapolis Campus
Minneapolis, Minn.

For information:
(612) 625-6164

April 24
Dean's Reception
Star of the North Meeting
5:00 p.m. to 7:00 p.m.
Saint Paul Hotel
Saint Paul, Minn.

April 23-25
Star of the North Meeting
Saint Paul RiverCenter
Saint Paul, Minn.

For information:
(612) 767-8400
(800) 950-3368

MAY 2015

May 14
Senior Banquet
(By invitation only)

May 14-16
South Dakota Dental Association Annual Session
Sheraton and
Convention Center
Sioux Falls, S.D.

Alumni Reception:
Sheraton and
Convention Center
May 15
Time: TBD

May 15
School of Dentistry Graduation
10:00 a.m.
Northrop Auditorium
University of Minnesota
Minneapolis Campus
Minneapolis, Minn.

For information:
(612) 625-8947

Receptions and Reunions

Dental Hygiene Alumni Luncheon
April 24, 2015, 12:30 p.m.
317 on Rice Park
Contact: Emily Best, (612) 625-6164

American Association of Endodontics Annual Session
May 6-9, 2015
Alumni Reception: To be announced
Contact: Dr. Scott McClanahan

American Association of Orthodontists Annual Session
May 15-19, 2015, San Francisco, Calif.
Alumni Reception: May 16, Moscone Center, West Building
Contact: Dr. Steve Litton

American Academy of Pediatric Dentistry Annual Session
May 21-24, 2015, Seattle, Wash.
Alumni Reception: To be announced
Contact: Dr. Soraya Beiraghi

For more information

Except where noted, you can obtain further information on the events listed and/or request disability accommodations by contacting:

Emily Best
Alumni Relations
(612) 625-6811
emilyj@umn.edu

To stay informed about events at the University of Minnesota, see the Twin Cities Campus Event Calendar at www.events.tc.umn.edu

CDE Courses

Discount Available

School of Dentistry Alumni Society members are eligible for discounted continuing education. Members may receive a 10 percent discount for "lecture only" courses offered through the University of Minnesota School of Dentistry. (This discount applies to School of Dentistry Alumni Society members only and not their employees.)

JANUARY 2015

Advanced Composite Restorations: Course Two—Postgraduate Program in Contemporary & Esthetic Dentistry: Level II
January 9-11, 2015

Protocols in Panoramic Radiographic Interpretation
January 16, 2015

Current Concepts in the Restoration of Endodontically Treated Teeth: A Lecture & Hands-on Workshop
January 17, 2015

What's New in Dentistry
January 23, 2015

Research Design—Postgraduate Program in Contemporary & Esthetic Dentistry: Level III
January 23-24, 2015

Successful Endodontics: Foundations and New Treatment Avenues
January 30, 2015

Dental Equipment Maintenance, Repair & Safety: A Hands-on Workshop for the Dental Team
January 31, 2015

FEBRUARY 2015

TMD and Orofacial Pain Miniresidency
February 2-4, 2015

Clinical Grand Rounds for the Dental Team: Sleep Apnea
February 5, 2015

20th Annual Ski & Learn: Steamboat Springs, Colorado
February 5-7, 2015

Interpreting Cone Beam CT Images: An Interactive Workshop
February 6, 2015

Winter Dental Hygiene Seminar: Contemporary Caries Assessment and Management of OTC Product Review
February 20, 2015

Updates in Ultrasonic Hand Instruments: A Workshop for the Dental Hygienist
February 21, 2015

Removal of Bond Material with Rotary Instrumentation: A Hands-on Program
February 26, 2015

11th Annual Dental Research Updates from the U of M
February 27, 2015

MARCH 2015

Clinical Grand Rounds for the Dental Team
March 5, 2015

Mastering Digital Full-mouth & Panoramic Radiographic Technique: A Hands-on Program
March 7, 2015

Everyday Endodontics: A Hands-on Program for General Dentists
March 13-14, 2015

How to Avoid Regulatory Implosion: 2015
March 20, 2015

Miniresidency in Pediatric Dentistry
March 20-22, 2015

Connecting Periodontal Health with Systemic Well-Being: What does this mean to your practice?
March 27, 2015

Endoesthetics—Postgraduate Program in Contemporary & Esthetic Dentistry: Level III
March 27-28, 2015

APRIL 2015

Clinical Grand Rounds for the Dental Team
April 2, 2015

Spring Recordkeeping Workshop for the Dental Team
April 16, 2015

Implant Supported Prosthesis: Hands-On Program
April 17-18, 2015

Advanced Occlusion & TMD—Postgraduate Program in Contemporary & Esthetic Dentistry: Level III
April 30-May 2, 2015

MAY 2015

Dental Hygiene Refresher: A Hands-on Program
May 4-8, 2015

Spring Core Competency Day for the Dental Team
May 8, 2015

Local Anesthesia: A Hands-on Training Program
May 11-13, 2015

Local Anesthesia Refresher: A Hands-on Review
May 29, 2015

For more information

For more information, to register for classes and/or to request disability accommodations, contact:

Continuing Dental Education
6-406 Moos HS Tower
515 Delaware Street SE
University of Minnesota
Minneapolis, MN 55455

Phone:
(612) 625-1418
or (800) 685-1418

Fax:
(612) 624-8159

Website:
www.dentalce.umn.edu

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University of Minnesota
15-209 Moos Tower
515 Delaware Street S.E.
Minneapolis, Minnesota 55455

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