Transformations



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MISSION

...to improve oral health and quality of life through the education of oral health professionals and scientists, the conduct of research, the promotion of health and disease prevention, and the delivery of oral health care to communities throughout the state and beyond.

A MESSAGE FROM THE DEAN

From 2600 BC—when Egyptian scribe Hesy-Ra was documented as the world's first dentist—until today's digital age, our profession has undergone a nearly infinite amount of changes.

But the goal remains the same: to transform the lives of our patients in ways that are sometimes subtle, sometimes dramatic. Our students and faculty make a difference, whether we're encouraging Essex County grade schoolers to brush and floss, extracting a decayed tooth in our Newark clinics, providing implants at our faculty practice in New Brunswick, or surgically correcting a patient's cleft lip in Bangladesh.

At the same time, our profession is transforming itself. We're moving further into the high-tech world, but the transition is not yet complete. While digital dentistry has changed the landscape of oral health care,



traditional methods haven't faded. Our students are incredibly fortunate to learn at a time when they can benefit from the best of old and new. Last year, we began a three-part effort to expand our digital dentistry curriculum, adding new software, equipment and lab space.

It's exciting to be part of another health care transformation as well: interprofessional care. We've long known that patients benefit when all of their needs are considered and

providers communicate with each other rather than working in silos. At Rutgers School of Dental Medicine (RSDM), our students are part of this evolution. In our federally funded Special Populations Interprofessional Care Experiences (SPICE) program, they work with Rutgers students from other health care fields to treat underserved patients at a nurse-run clinic in Newark. The collaboration underscores the important connection between oral health and overall health.

The work of our researchers also shows how oral health is linked to systemic health, often in surprising ways. Our researchers have received major funding from the National Institutes of Health (NIH) and the U.S. Military to explore how bacteria found in the oral cavity can yield potential treatments for cancer, autoimmune disease and drug-resistant bacteria. We are nearly finished a \$16 million renovation of our lab space, which will advance our research mission.

This past year has been a time of transition and transformation at RSDM. But we never lose sight of the smaller changes that happen each and every day, and we welcome the change that lies ahead.

Sincerely,

Cecile A. Feldman, DMD, MBA *Dean, Rutgers School of Dental Medicine*

A MESSAGE FROM THE CHANCELLOR

At Rutgers Biomedical and Health Sciences (RBHS), we play a leading role in the many changes transforming health care. We are at the forefront of advances in digital technology, interdisciplinary care, and research that will shape the health care landscape of tomorrow.

Transformation, the theme of the 2017–2018 Rutgers School of Dental Medicine Annual Report, perfectly encapsulates, not only how Rutgers is reshaping health care on a broad scale, but the difference we can make in the life of each patient.

Both kinds of change—sweeping shifts that take us beyond the status quo, and the life-altering encounters that happen every day between provider and patient—are intertwined at Rutgers. One would not be possible without the other.

The Rutgers School of Dental Medicine has transformed lives in ways big and small, in New Jersey and around the globe. Its visionary research in oral biology has the potential to change the way we treat systemic illnesses, as well as diseases of the oral cavity. With funding from the National Institute of Health (NIH) and the Defense Advanced Research Projects Agency (DARPA) of the U.S. Department

of Defense, RSDM researchers are developing treatments for cancer and drug-resistant pathogens. They've also received NIH funding to explore new ways to diagnose and treat dental caries, gum disease and periodontal disease.

RSDM has created innovative academic programs that enable students from different health care disciplines at Rutgers, such as the Schools of Nursing and Pharmacy, to help underserved communities through an interprofessional model of care.



When students and faculty work together at RSDM, they transform lives—easing the physical pain of dental disease and facial trauma and the psychological effects of disfiguring conditions and illnesses. They are an integral part of Rutgers' mission to create a better, healthier world for us all.

Sincerely,

Brian L. Strom, MD, MPH Chancellor, Rutgers Biomedical and Health Sciences



Education

JOINING THE EVOLUTION

At RSDM, we stay one step ahead of changes that are transforming oral health care. In the classroom and on the clinic floor, we embrace new technology, revolutionary treatment philosophies and the latest evidence-based research. We cultivate the value of national and local demographic shifts among patients, providers, students and faculty.

In the past year, we've greatly expanded our digital dentistry curriculum, providing more opportunities for students to master technological tools. In our clinics, they have broader access to updated digital equipment that helps diagnose and treat patients. In preclinic and in the dental arts studio, cutting-edge software measures the quality and precision of their work.

Another change transforming dentistry, and America, has been invaluable to RSDM: diversity. We are one of the most diverse dental schools in the nation and have been greatly enriched by the RSDM community's many cultures and ethnicities. Our diversity and inclusion programs have become national models. Last year, RSDM received an \$85,000 grant from the ADEAGies Foundation to help underrepresented students and recent graduates nationwide become leaders in the field of academic dentistry.

The program is designed to encourage students who are underrepresented, including LGBTQ students, to become faculty and administrators at dental schools and institutions that educate dental hygienists. RSDM presented seminars at the Greater New York Dental Meeting in conjunction with New York University's College of Dentistry, UCLA School of Dentistry and Hostos Community College School of Hygiene. This year, the program will travel to Puerto Rico and RSDM will host national webinars on the topic in association with ADEAGies and the American Dental Association (ADA). The principal investigator of the grant is Dr. Rosa Chaviano, Associate Dean for Admissions, who worked with co-principal investigator Dr. Herminio Perez, Director of Student Affairs, Diversity and Inclusion.

As the medical world moves toward an interprofessional model, RSDM students and faculty have collaborated with other Rutgers schools to improve the future of patient care. We've exchanged ideas and expertise with students from Rutgers New Jersey Medical School and Robert Wood Johnson Medical School, and those training to be social workers, nurses, physical therapists, pharmacists, dental hygienists and nutritionists, among others. After working on hypothetical cases together, we have begun treating patients as a team. Patients benefit greatly when their oral health needs are part of a holistic form of care, and our work across disciplines has helped other providers realize that oral health impacts overall health.

(continued on page 4)

Broader access to digital equipment and cutting-edge software provide students with opportunities to master technological tools.



First-time pass rates for the National Board Dental Examinations were 99 percent for Part One and 95 percent for Part Two.

99|95

Students use sophisticated digital programs to track patients' prescription history, making it easier to determine who may be at greater risk for opioid addiction.







"THIS IS THE FUTURE, AND IF YOU DON'T LEARN NEW SKILLS, YOU'LL BE LEFT BEHIND."

- DR. HEBA ELKASSABY

(continued from page 3)

We continued our interprofessional work at the Rutgers FOCUS Community Health Center in our home base of Newark, where RSDM students provide oral health screenings while working with nursing students and others. The program was funded with a \$2 million grant awarded in 2016.

Both trends—technology and interprofessionalism—are even more critical as providers struggle with a deadly public health crisis: the opioid epidemic. Opioid abuse, which often begins with a prescription for painkillers, is transforming the medical profession, especially oral health care, since providers often treat chronic and acute pain. Increasingly sophisticated digital programs, used by our students, track patients' prescription history and make it easier for dentists to consult with other providers.

This year, New Jersey passed stringent laws that limit prescriptions for opioids and require continuing education for providers. RSDM Dean Cecile A. Feldman spoke out about the epidemic in *NJ Spotlight*, an influential journal on public policy, calling upon providers to go above and beyond new regulations by seeking alternatives to opioids. She predicted that today's dental school students, with their awareness of opioid abuse, will be less likely to prescribe the drugs.

In 2017 and 2018, we continued our rigorous competency-based clinical program, which is lauded by residency directors and other professionals, who report that our students' skill and experience level is far above their peers. Our first-time pass rate for the National Board Dental Examinations was 99 percent for Part One of the test and 95 percent for Part Two. Eighty-nine percent of our graduating students who sought placement through our Match Program were placed, compared to 66 percent nationally.

As we adapt to an ever-evolving profession, an RSDM education is rooted in tradition. Students acquire essential knowledge and techniques, enabling them to become tomorrow's change makers. And always, they develop the timeless values of integrity, compassion, discovery and hard work.

Beyond Analog

Dentistry is being revolutionized by CAD/ CAM technology, but traditional techniques are just as important. That means RSDM students are in the unique position of drawing from the best of both worlds: analog and digital dentistry.

Problems associated with conventional methods—messy impressions, discrepancies between patients' teeth and dental models, tedious lab procedures—can be avoided with optical impressions.

But it's critical for students to learn both high—and low-tech patient management. "Digital dentistry makes no sense if you don't know the other methods. Conventional techniques reinforce basic dental skills," says Dr. Heba Elkassaby, chair of RSDM's advanced digital technology committee and assistant professor in the Department of Restorative Dentistry.

In the past year, RSDM has made great strides in keeping up with a rapidly changing profession.

The school is in the midst of a three-phase effort to add new digital dentistry resources on the clinic floor and in the classroom. Students now work with intra-oral scanners, which can duplicate a patient's dentition within minutes onscreen. Preclinical computerized self-assesment technology helps them learn by precisely measuring student tooth preparations against an ideal preparation.

"You can't imagine how excited the students are to use this technology," says Elkassaby. "It's an interactive and fun way of learning. It has engaged them and improved their understanding of basic principles."

Last year, RSDM began a project to greatly develop its digital programs, purchasing preclinical oral scanners, clinical scanners, computerized assessment laboratories, and 3D printers donated by Stone Glass Industries.

Keeping up with innovations in digital dentistry ensures that students are wellequipped to succeed. "We'll be graduating dentists who are highly competitive in a private-practice setting as well as in academia. They're learning how chair time can be more efficient, how a new business model can be integrated into their daily workflow and how to enhance interdisciplinary communication and referrals between dental specialists," said Elkassaby.



Making the Connection

One of dentistry's most basic procedures—a teeth cleaning—prompted a profound realization for Sunaina Belgrave. "I didn't think anything much about it, it was just a regular prophy. But when I gave the patient a mirror and she looked at herself, she was blown away. It removed a stain she had on her tooth, and she was so shocked and happy, just from a cleaning," said Belgrave, who graduated in May of this year.

The experience changed her approach to patient care. "I learned that most of dentistry isn't about the procedure itself but how the patient feels when they leave the chair," she added. "It made me think about my patients more, what they want and what makes them happy."

As a student in RSDM's Community Oriented Dental Education (CODE) program in South Jersey, Belgrave treated many patients who were medically compromised, including those who were HIV-positive. The experience helped her realize that making the time and effort to develop relationships with patients can dramatically improve how they respond to treatment. "If they're not talking much and having a bad day, always take a few moments to talk to them. Even if I'm not a psychologist, I get to know them and it helps to make them more comfortable," explains Belgrave, who joined the Navy as an officer after graduation.

Her journey to dental school began in RSDM's Gateway to Dentistry, one of the nation's first pre-dental immersion programs, which offers hands-on experience in preclinic. "I learned how diverse dentistry is, that it doesn't stop in the operatory but can include research, forensics, teaching, many things," said Belgrave.

It's a lesson that has stayed with her today. "Dentistry expands beyond the clinic, into the community," she said.

Joining the Evolution

SUNAINA BELGRAVE

A routine teeth cleaning prompted an epiphany for graduate Sunaina Belgrave.

Joining the Evolution
AHMED NAGY

Ahmed Nagy is changing the way international students navigate dental school.



After graduating from dental school in Egypt, Ahmed Nagy knew he wanted to practice dentistry in the U.S. "I felt like there were better opportunities for me to learn more," he said. "So I gave it a try and came here and tried to see how the dental field worked."

Nagy worked for a year in California as a dental assistant, then began looking at schools so he could earn his DMD. But navigating the process of finding international programs, and adjusting to dental school in America, wasn't easy.

"It's hard to know what different schools are looking for," he said. "Some want people with more experience, some look for other things."

He was accepted into RSDM's International Dentistry Program, which helps dentists educated outside the U.S. or Canada earn a degree that will allow them to practice in America. But he longed to help other international students cope with some of the confusion and uncertainty he faced. Nagy was lucky enough to find a mentor early on who guided him through the process of building his profile, completing applications and mastering the interview process. Nagy wanted to fill that role, too.

This year, he found a way to create change. In February, the American Student Dental



Association (ASDA) appointed him to the International Student Advisory Committee. One of a handful of dental students chosen nationwide, he hopes to transform the often solitary experience of becoming an international student so that networking, and collaboration, are the norm.

Nagy and his ASDA team have been reaching out to international students across the northeast to determine what they should know and how ASDA can help them use social media and other channels to link with mentors. "Being part of organized dentistry through ASDA can really help. You get to meet people from all over. It makes your life easier when you know how everything works."

Students work on mannequin heads, known as typodonts, in preclinic.

7

Patient Care

In 2017, 6,148 patients visited the pediatric clinic.



Total number of patient visits in 2017

126,986



Rutgers Health University Dental Associates' New Brunswick office celebrated its first full year of treating patients in 2017.

METAMORPHOSIS

At RSDM, we transform the lives of patients every day. Oral and maxillofacial surgeons heal disfiguring injuries and correct congenital abnormalities. Maxillofacial prosthodontists make artificial ears and other facial parts for those who've lost them to trauma or disease, in addition to more commonplace creations, like dentures.

Orthodontists straighten teeth and work with surgeons to ensure that jaws don't severely recede or extend too far forward. Chipped teeth are fixed, stains are removed, missing teeth are replaced with bridges, implants and crowns.

Other changes are less noticeable. We stop the pain of cavities, gum disease and infected pulp. We screen for oral cancer. We prevent dental disease through cleanings, fluoride treatments for children and education about oral health care. For those with chronic orofacial pain, we provide relief.

RSDM is the state's largest provider of oral health care, and we improve public health in the communities we serve by making care more accessible to thousands who couldn't otherwise afford it.

In 2017 we logged 126,986 patient visits, including 6,148 visits to our pediatric clinic. There were 4,757 visits to our Delta Dental of New Jersey Special Care Center, which treats patients with physical disabilities and mental illness. It is one of the only facilities of its kind in the region.

Our state-of-the-art Dental Specialty Center, which opened two years ago, provides advanced training to postgraduate students. Its interdisciplinary approach changes the model of oral health care in New Jersey, improving convenience and comfort for patients, who can be seen by different specialists in the same clinic. Students and faculty benefit from an atmosphere of close collaboration.

The center includes surgical suites for teaching advanced implantology, periodontal surgery, endodontic surgery and maxillofacial prosthetic treatment. It also houses an orthodontic clinic and a general practice clinic for residents.

Providers at RSDM's Center for Temporomandibular Disorders and Orofacial Pain include some of the world's leading authorities in the field, specializing in patients who often have rare disorders that were misdiagnosed by other providers.



RSDM'S NEW DENTAL SPECIALTY CENTER OFFERS COLLABORATIVE CARE FROM A VARIETY OF TOP-NOTCH SPECIALISTS, INCLUDING ORTHODONTISTS.

(continued from page 8)

In 2017, we celebrated our first full year of treating patients at Rutgers Health University Dental Associates' New Brunswick office, our new faculty practice. In the private-practice setting of our Newark and New Brunswick offices, expert doctors and dentists who teach at RSDM provide world-class care. The practice, and all school clinics, are part of the Rutgers Health brand, which encompasses clinical components of Rutgers-wide schools, institutes and centers.

At our clinics and faculty practice, we take pride in offering compassionate, personalized care. Our students are educated to consider cultural differences and the best way to help patients who are anxious about dental visits. As we train the next generation of dentists, specialists and surgeons, we are doing our part to transform health care.



A New Start

After her daughter Amy was born with a cleft palate, Zaida Morocho of Newark feared she wouldn't thrive. For children born with the condition, eating and swallowing are difficult and patients often have issues with loss of hearing.

A cleft palate is a congenital abnormality that occurs when tissue in the roof of the mouth doesn't join completely during a child's prenatal development. Unlike deformities that result from a cleft lip, cleft palates aren't noticeable to most onlookers. But they can have a great impact, affecting speech development, hearing and the ability to eat, even after infants receive bottles outfitted with special nipples designed for their mouths. In some cultures overseas, people believe that cleft lips and palates are the result of a curse.

For parents, the condition is often a source of deep anxiety—particularly if they didn't have access to prenatal care that allows doctors to detect signs of cleft palate in utero.

"Unless you received regular prenatal care and an ultrasound, you probably wouldn't know," said RSDM's Dr.Vincent Ziccardi, Chair of the Oral and Maxillofacial Surgery Department, who treats many cleft lip and palate patients.

Luckily, despite her cleft palate, Amy's infant development had few complications. When she was 15 months old, Dr. Ziccardi performed corrective surgery, which typically occurs when cleft palate patients are between 12 and 18 months.

Since some patients need further treatment later in childhood and adolescence, Dr. Ziccardi, who is part of Rutgers Health University Dental Associates, RSDM's faculty practice, will monitor her over time to make sure her jaw and facial development are on course.

For now, her treatment is going well and Amy's mother is grateful. It's much easier for her baby to eat, and even the sound of Amy's cries are a relief. "Before when she cried, she didn't sound much like a baby because of the sound of her voice. And now she does," said Zaida Morocho.

Finding her Smile

As a child, Gemma Boyer loved to pose for pictures, flashing her wide toothy grin.

But because she has Sjögren's syndrome which dries moisture from the eyes and mouth—her teeth became badly decayed. By her late teens, she no longer wanted to show off her smile. Boyer lost confidence and felt uncomfortable going out with friends. Consigned to a diet of soft foods, it was difficult for her to eat what she liked.

"I didn't want to go anywhere or be seen by anyone," says Boyer, 23. "I didn't even want to be around my family at holiday parties."

Last year, she sought treatment from providers at RSDM, where she had a full-mouth extraction and began the process of regaining her smile with help from Dr. Mohamed Kamel, an RSDM associate professor who also practices with Rutgers Health University Dental Associates.

Ultimately, Kamel will create prosthetic crowns for dental implants that will replace Boyer's missing teeth. But in the meantime, he made dentures that are so dazzling and perfectly fitted, no one can believe they're not Boyer's real teeth. "We went through the process together, we choose the shape of her teeth, the gum shape and the gum color," he explains. "She had the dentures the same day as her extractions. Not every dentist knows how to do that, but we were able to accomplish it."

The results have been life-changing. These days, Boyer loves socializing. She no longer hesitates to speak or covers her mouth when she laughs. And once again, she is unafraid of the camera. "I take a lot of selfies now," she admits with a laugh.

Metamorphosis GEMMA BOYER

Gemma Boyer suffered from badly decayed teeth at a young age. Dentures transformed her life.



Cutting-edge technology in our Dental Specialty Center

Resting Easy

It's estimated that 22 million Americans suffer from sleep apnea, which can cause high blood pressure, acid reflux disease and increase the risk of stroke. But 80 percent of cases go undiagnosed. For lower income patients, lack of affordable health care makes it even harder to get properly diagnosed and treated.

"There's a problem with access. We wanted to address that," said Dr. Sowmya Ananthan, a faculty member who treats patients at RSDM's Center for Temporomandibular Disorders and Orofacial Pain. She has also been involved in clinical research of obstructive sleep apnea.

Last year, RSDM began working with Horizon Medicaid HMO on a plan that will allow Medicaid coverage for a newer form of sleep apnea treatment. Patients who have healthy teeth and jaws can be fitted with a mandibular advancement device (MAD), similar to a retainer, which pulls the lower jaw forward so that the airway is cleared.

The MAD negates the need for a Continuous Positive Airway Pressure (CPAP) machine, which requires patients to place an apparatus over the face during sleep. Many find it uncomfortable and don't use it consistently.

Dentists can often detect symptoms of sleep apnea, such as teeth grinding and a larger-thanusual tongue, which can block air passages in the mouth. When RSDM providers suspect patients have the condition, they can refer them to the Rutgers New Jersey Medical School's sleep laboratory for a diagnosis. If they have sleep apnea, they can receive a custom-made MAD at RSDM.

The arrangement with Horizon will transform sleep apnea treatment in New Jersey, making it accessible to thousands of patients who otherwise wouldn't receive care. "As far as I know, no one outside of RSDM offers this," says Ananthan. "People from all over the state can come here."



an alternative treatment for patien

Dr. Sowmya Ananthan holds a mandibular advancement device, an alternative treatment for patients with sleep apnea.



Research

Dr. Daniel Kadouri is working to halt a global epidemic of drug-resistant pathogens.

GAME CHANGERS

RSDM researchers have achieved milestone breakthroughs with work that is inherently transformative. They use microbes found in the oral cavity as the basis for treating cancer, HIV, multiple sclerosis, drugresistant bacteria and other illnesses.

Others use stem cells to regenerate dental pulp in hopes of restoring health to dead tissue, which could someday transform the root canal procedure.

Their work fighting caries and periodontal disease could lead to transfigurative new methods of diagnosis and treatment. Industrial research for Colgate Palmolive and other companies supports the creation of oral hygiene products that have a global impact on public health. Our Department of Oral Biology, where this work takes place, is one of the most well-funded basic science departments at Rutgers University.

As part of research that explores links between systemic illnesses and the microbiology of the mouth, we are studying the connection between heart disease and oral bacteria, in addition to the genetic origins of diseases of the oral cavity.

Researchers from our Center for Temporomandibular Disorders and Orofacial Pain include internationally recognized faculty who explore how the body perceives and processes pain. They also collaborate with researchers worldwide to create new diagnostic standards for the treatment of chronic pain. Many of their patients suffer from conditions that were repeatedly misdiagnosed before they were treated at RSDM. These include extremely rare nerve disorders and syndromes affecting the mouth and face.

This year and last, we received funding from the NIH, the U.S. Military and private industry. Our funding totalled \$5.3 million, including multi-year grants.

But one of our most significant transformations has been the \$16 million state-funded construction of new labs and research offices, which began in 2016 and is expected to be completed this year.





Dr. Daniel Fine is exploring the connection between bacteria in the mouth and heart disease.





Game Changers **DR. SCOTT KACHLANY**

Dr. Scott Kachlany received \$4.4 million in venture capital to develop a potential therapy for cancer and autoimmune disorders.

Investing in the Future

Dr. Scott Kachlany received a \$4.4 million commitment in venture capital last year to bring a potential therapy for cancer and autoimmune diseases closer to human clinical trials.

Kachlany's company, Actinobac Biomed Inc., is slated for funding from the California-based Kairos Ventures, which will pay for the final stages of preclinical development before his therapeutic technology, called Leukothera, is tested on humans.

Leukothera is based on Kachlany's discovery that an oral bacterium that causes periodontal disease can produce a protein that can be used to kill leukemia cells in animals. It's also a potential therapy for autoimmune and inflammatory diseases, including rheumatoid arthritis, multiple sclerosis, Crohn's disease, and HIV infection.

Toxicity tests on animals so far indicate that Leukothera is very well tolerated. "Even at very high doses of the drug, there are no side effects," said Kachlany, a Department of Oral Biology associate professor.

He plans to use the \$4.4 million from Kairos to seek matching NIH funding that will enable Leukothera to be tested on humans with leukemia and lymphoma within the next three years.

Armed with Knowledge

For nearly a decade, Dr. Daniel Kadouri's research has mined the potential of predatory bacteria—microbes that devour germs immune to antibiotics.

He works to halt a global epidemic of drug-resistant bacteria that has led to a sharp rise in untreatable illnesses.

His research, a collaboration with Dr. Nancy Connell of Rutgers New Jersey Medical School, is funded by a \$7.2 million cooperative agreement between Rutgers University, the U.S. Military's Defense Advanced Research Projects Agency (DARPA) Pathogen Predators program and the Army Research Office (ARO).

Kadouri's research revolves around two types of bacteria: *Bdellovibrio bacteriovorus*, which penetrates prey and kills from within, and *Micavibrio aeruginosavorus*, which consumes germs from the outside.

They can eradicate bacteria that causes lung disease and germs found in wounds and burns,

in addition to foodborne pathogens like *E. coli* and *Salmonella*. He is continuing to build upon a research breakthrough two years ago, when he and Connell discovered evidence that predatory bacteria can kill pneumonia in a rat animal model.

Breakthrough Discoveries

Dr. Daniel Fine, chair of RSDM's Department of Oral Biology, is known for his visionary work within the field.

Funded by a \$3.2 million in NIH grant he received in 2014, Fine is continuing a multiyear study of local aggressive periodontitis (LAP), a rare form of gum disease that affects two percent of African-American children ages 11 to 17.

For more than 10 years, Fine and his team have worked with over 2,000 adolescent subjects in Newark. At six-month intervals, they are monitored for LAP, which only affects central incisors and molars, resulting in disfiguring tooth loss and difficulty eating.

Since the study began, he discovered a marker in the saliva of subjects with LAP that can be used to detect the disease up to nine months before bone loss appears in x-rays. He is working on developing it as a tool for early diagnosis and treatment of the disease.

This year, Fine's team also began finalizing preliminary studies on the link between dental plaque and heart disease. Dental plaque has been found within the walls of clogged arteries because oral bacteria can travel from the bloodstream to the heart.

Fine believes that people who have more permeable tissue around the gum are also more likely to have heart disease because it allows bacteria to more easily travel through the bloodstream.

To prove it, his team has been conducting clinical studies in which subjects bite an apple before tests measure their levels of bacteremia, the term for the presence of bacteria in the bloodstream.

His goal is to determine if subjects with heart disease have a higher level of bacteremia than those with healthier hearts. "Then that would suggest there's a connection," explains Fine.

Previous RSDM studies performed in partnership with Colgate showed that Total toothpaste reduced the level of bacteremia for





people who bit the apple and then brushed their teeth. If Fine further establishes a connection between oral bacteria and heart disease, Total could be an important means of prevention. Fine plans to apply for an NIH grant to pursue additional studies.

Room for Change

Built in the 1970s and early 1980s, RSDM's labs had grown antiquated and cumbersome to use.

In 2016, a \$16 million state-funded renovation began, a project that's expected to be completed this year. It adds new facilities for RSDM's Center for Oral Infectious Diseases, as well as the center for microbiology and immunology.

The old laboratories will be renovated to house facilities for researching biomaterials, pain research and behavioral science.

"It's going to be a model for the future," said Daniel Fine, Chair of the Department of Oral Biology. "It will increase the breadth of our research in the dental school and parallel the university's expansion of research in general."

Game Changers

DR. DANIEL KADOURI

Dr. Daniel Kadouri's research on predatory bacteria could help create an alternative to antibiotics.

Community Service

Patients screened at Rutgers FOCUS Community Health Center, which has received \$17 million in federal funding

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Since 2002, we have received federal Ryan White funding for patient in underserved regions.

MAKING A DIFFERENCE

RSDM is an invaluable public health resource, improving the lives of underserved patients around the globe and in our own backyard. We help those who've never visited a dentist or used a toothbrush because they couldn't afford one. We relieve pain and restore smiles for patients with little or no access to oral health care.

In turn, our students are transformed by working to equalize local and international health care disparities. All are required to complete a four-hour minimum of community service. RSDM students and faculty make annual trips to Haiti, the Dominican Republic, Bangladesh and Sri Lanka. Since 2004, they've also travelled to a Native American reservation in Arizona to staff a federally run dental clinic while dentists there are on vacation. To prepare, students learn about Native American culture so they can offer the best treatment.

At home in our Newark and South Jersey clinics, students and faculty see daily evidence that they're improving the lives of patients and their communities. RSDM is one of the few oral health care providers in New Jersey that accepts Medicaid, which covers many of our patients. A large number of patients live in Newark, where 30 percent of residents live below the poverty level. At our Community Oriented Dental Education program (CODE) in South Jersey, fourth-year students also treat many disadvantaged patients. For more than 20 years, we've been leaders in dental treatment for HIV/AIDS patients. Since 2002, we've received federal Ryan White funding for patients in underserved regions.

Each year, we participate in Give Kids a Smile Day (GKAS), when we offer free screenings, dental sealants and oral health tips to Essex County children, many of whom are underserved. In 2017, the American Dental Association marked the anniversary of GKAS, a nationwide event, by choosing RSDM to host the celebration.

In 2016, we received nearly \$2 million in federal funding for an interdisciplinary program that enables students to provide oral health screening at Rutgers FOCUS Community Health Center in Newark. They work with student nurses, pharmacists, social workers and others. Last year, the program, in its third year, served 74 patients, including 47 who were referred to RSDM's dental clinics.

Nearly 90 percent of the 116 students who completed the program last academic year said they gained a new understanding of the roles played by providers from other fields.



Left, A pediatric patient in the Dominican Republic shows off his smile. Right, A burn victim in Sri Lanka after surgery.

No Longer Scarred for Life

After her husband threw hot oil on her in a fit of rage, the patient, from Sri Lanka, suffered neck and facial scarring so severe she couldn't turn her head. Another burn victim couldn't lift her arm due to a webbing of scars that surrounded it.

Movement was restored by a team of RSDM surgeons on a mission to Sri Lanka, where they set up their first reconstructive surgery clinic in 2017. This year, they returned.

"The fact that they could move those parts of their bodies again, they were very happy," said Dr. Shahid Aziz, a professor of Oral and Maxillofacial Surgery, who headed the effort.

The clinic was established in the city of Jaffna, a central location during Sri Lanka's six-year civil war, which ended in 2008. Many residents sustained burns on their face and body, facial fractures and mutilated ears and noses, the result of shrapnel and other attacks. The RSDM surgeons were able to treat about 30 patients within five days, and they plan on returning next year.

Aziz also continued Smile Bangladesh, an annual mission he founded in 2006 to help citizens disfigured by cleft lips and palates. In the U.S., cleft palate surgery, which takes only an hour to complete, is commonly performed on infants. But in Bangladesh, there are many older children and adults who have lived with the deformity all their lives, according to Aziz, who was born in Bangladesh. Because there is a shortage of skilled surgeons there, RSDM held its first symposium on orthognathic surgery during the trip. The surgery, which corrects misalignment of the jaw and face, is often used to repair cleft lips and palates.

"They've never had proper training and adequate resources to support this work," Aziz explains. "Part of my goal is to help bring this type of surgery to Bangladesh."

Both Sides Now

Since 2011, RSDM volunteers have embarked on an annual dental mission serving patients from Haiti and the Dominican Republic. That first year, they worked in one clinic on



Students screen patients on a dental mission to Haiti.



the border of both nations, treating nearly 200 patients. This year, they set up two clinics—one in each country—and treated more than 900 Haitian and Dominican patients.

They also brought new treatment and diagnostic methods: digital x-rays, and silver diamine fluoride to stop tooth decay.

Over the years, volunteers have seen the long-term success of their preventive efforts, such as fluoride sealant applications and oral hygiene giveaways to citizens who can't afford toothpaste and a toothbrush.

"We've sealed so many teeth that we're starting to see them come back with less decay, or no decay at all," said RSDM faculty Dr. Pam Alberto, who heads the effort, funded by the Cheerful Heart Mission, a humanitarian organization focusing on health, education and economic development in Haiti and the Dominican Republic.

Student Greg Ramirez was touched by the short-term results of his mission work. "There were kids who had chipped teeth, who just wanted them fixed so they could smile again," he said. He was also glad for the chance to hone his skills. "We had more autonomy than we do at school and after the first couple patients, I felt more comfortable and confident," he said. "I'm not hesitant to drill into a tooth anymore."

Special Thanks

Before they return home from their mission to La Romana, a Dominican town where residents work harvesting sugar cane, RSDM volunteers receive a batch of crayoned thank you cards.

They were made by children from the local school and orphanage who visited the clinic for screenings and treatment.

In four days, the RSDM team provided dental services to 111 patients ranging from ages 6 to 17, and performed a total of 170 dental procedures. Last year, on the mission's inaugural trip, students performed mostly fillings but this time around, they had the chance to do everything from surgical extractions to root canals and preventive care.

For RSDM students, it was a revelatory experience. "Seeing the level of oral health needs there, and being able to have an impact, helped them find a larger sense of purpose," said Dr. Herminio Perez, Director of Student Affairs, Diversity and Inclusion, who led the trip. "It's not the same as, 'I just want to be a dentist.' Our reality is, you go and have



patients where people hardly ever see a dentist. It helps them understand the meaning of why we're doing this."

The outreach program was a collaborative effort between World of Smiles, and Fundacion Mir, with the support of 3M, the International College of Dentists and the New York Academy of Dentistry.

Floss Boss

It seems like an impossible goal, but Stephanie Gomez is determined. "I'm trying to make flossing seem cool," she declares.

To that end, she created the "Floss Boss" challenge, which offered flavored floss and other oral hygiene giveaways to people who commit to flossing 21 days straight.

Gomez, a third-year student, tested her program at a fall community health fair in the Bronx, her hometown.

It was one of many outreach efforts she has organized in her quest to transform communities where residents have limited access to oral health care and education. Gomez has been helping others since high school, when her work to aid homeless residents earned her a \$100,000 college scholarship from McDonald's, awarded to only four Hispanic students nationwide.

The daughter of Dominican immigrants, Gomez identifies with the struggles and strengths of her patients in Newark, the Bronx and overseas. As a girl, she watched a run of bad luck push her family to the brink of homelessness. She saw her parents forgo their own health needs so they could afford doctor and dental visits for Gomez and her siblings. "I lived through that, so I know what it's like," she says.

She also knows what's possible. "I wanted an education and skills where I could give back to and my community. This is why I'm here. This is what I want for my future."

Making a Difference

STEPHANIE GOMEZ

Student Stephanie Gomez creates educational programs like "Floss Boss," which she launched in her hometown of the Bronx.



Alumni

There are 4,802 RSDM alumni worldwide.

FORWARD TOGETHER

From its 1956 origin as the Seton Hall College of Dentistry until today, alumni and other supporters have played a key role in RSDM's growth and development.

They share their time, financial support and knowledge with students and faculty. Others show the world how an RSDM education can transform lives and the future of the profession. They inspire others with their compassion, innovation and commitment to improving lives.

By endowing scholarships, funding new state-of-the-art clinics and donating equipment and new technology, they help RSDM remain steadfast in its commitment to quality patient care and student education.

Our supporters gave more than \$300,000 to fund student scholarships, including one very generous donation for a new endowed scholarship. The gift was from alumnus and long-time supporter Dr. Anthony R.Volpe, Class of '60, and his wife, Marlene M.Volpe. Called the Anthony R.Volpe, DDS, MS Endowed Scholarship, it will be given annually to a third-year pre-doctoral student who ranks in the top 25 percent of his or her class and is in need of financial aid.

As New Jersey's only dental school, we have also been instrumental in ensuring that the

state's practicing dentists, including many of our alumni, keep pace with a rapidly changing profession through our Continuing Dental Education programs.

In 2018, we held our third biennial symposium: "Interdisciplinary Treatment—The Key to Success." World-class authorities from multiple specialties shared their expertise, along with information on evidenced-based techniques and treatment philosophies.

Thanks to our Continuing Dental Education Department, we are also one of only a handful of institutions world-wide that offer the American Academy of Implant Dentistry's Implant Dentistry Maxicourse, which annually shares the field's newest advances. Last year, 100 percent of our participants passed the written portion of the exam.

Together, the many alumni, donors and professionals who work with us are dedicated to the same mission: harnessing our collective resources and passion to move health care into the future.



Alumni who graduated in a year ending in "7" showed their school spirit at last year's reunion.



Our supporters donated more than \$300,000 to fund student scholarships in 2017.





"ANYTHING THAT CHANGES THE PERCEPTION OF DENTISTRY FROM SOMETHING TO BE AFRAID OF TO SOMETHING POSITIVE IS GOOD." —DR. EYAL SIMCHI

Making Cavities Disappear

Dr. Eyal Simchi isn't quitting his job for show biz—even after a video of him performing magic tricks for an awestruck toddler went viral.

Despite the hocus pocus—and his internet stardom—Simchi has no illusions.

"I'm not a magician at all. I'm a dentist," he says firmly. "The magic tricks are just something I do to help patients."

But Simchi, who graduated in 2007, was impressive enough to wow his audience in the video: a two-year-old boy who gasps in wonder and delight as Simchi plucks balls of light from thin air and begins a game of catch. The video, posted in May of this year, wracked up more than 30 million views on social media.

According to Simchi, the patient, not his showmanship, accounts for the clip's mass appeal. "He's a really cute and expressive kid," explains Simchi, whose Elmwood Park practice, Riverfront Pediatric Dentistry, also focuses on special needs patients.

The magic tricks distract children and help them relax, which makes his job easier. It's especially good for kids who've had traumatic dental visits in the past, he said.

But Simchi's strategy to make dental visits more fun may have backfired. Recently, when he urged one child to brush her teeth, she refused. "She wanted to get cavities so she could come back," he says with a laugh. After his video went viral, Simchi was inundated with media requests from around the world. He squeezed interviews between dental appointments and stayed on message. "Anything that changes the perception of dentistry from something to be afraid of to something positive is good," he says.

Meeting the Challenge

RSDM's Department of Periodontics received over \$103,000 in donations and pledges, thanks to Dr. Howard Drew, vice chair of the department. He created the "Dr. Drew Challenge" by giving \$50,000, which raised more than \$50,000 in matching funds.

After faculty and alumni became donors and completed the match, he and his wife, Ina Drew, contributed an additional \$50,000.

Drew issued the challenge to draw attention to the department's work and reputation. In recent years, it has grown to become a leading-edge training ground for periodontal, implant and laser surgery, as well as regenerative and esthetic surgical procedures. "The objective was to bring in our alumni and make them aware of some of our achievements," said Drew. "The most significant goal of the match was to enlighten them."

Drew ticked off a list of department accomplishments. "We've excelled in our clinical and didactic programs; we are doing



Dr. Howard Drew and his wife, Ina Drew.

great research and we have numerous publications in peer-reviewed journals," said Drew. "Last year, we performed a record number of implant surgeries."

Drew and others are also proud of the Dental Specialty Center, where periodontal residents perform clinical work alongside providers in endodontics, orthodontics, prosthodontics and other specialties. "The design of the facility lends itself to interdisciplinary therapy, communication and camaraderie," he explains. "Years ago, you had to go to another floor in the building to get a consultation with a dentist from another specialty. But now, the patients, faculty and everyone benefits."

In addition to raising money for the periodontal department, the campaign has increased attendance for department symposiums and continuing education courses, along with RSDM alumni events, according to Drew.

Since the 1980s, Drew has been a generous donor to the school, contributing to other projects and also creating the Ina and Howard Drew Maxillofacial Imaging Center.

Supply and Demand

Without top-notch technology and equipment, RSDM couldn't offer the caliber of patient care and education we provide each day.

Since 2008, Nobel Biocare has been supplying RSDM with annual funding and gifts-in-kind worth more than \$2 million, including digital dentistry technology, surgical instruments, dental implant screws and implant restorative components.

Some resources are donated to support our Continuing Dental Education programs, while others are used in clinics. "We believe partnering with a university like Rutgers is only going to aid RSDM in educating the

dentists of tomorrow," said John Casciano, New Customer Development Specialist for Nobel.

Nobel has also offered support for our digital dentistry program through innovations such as the Procera System, CAD/CAM technology that allows RSDM to fabricate custom



componentries for patients. "We want to further the next wave of digital dentistry. That's the transformation that's happening in the industry now," said Casciano.

The investment has been worth it, he says. "The wonderful thing about RSDM is that the clinical professors are truly passionate about dentistry and education. There's a high level of commitment and engagement. We want to see people performing well and treating patients better, and that's what's happening at the school."

Nurturing a Dream

Dr. George Jenkins doesn't remember the name of the RSDM orthodontist who fixed his teeth when he was 13. But he'll never forget how the student—completing his residency in the school's ortho clinic—inspired him to become a dentist.

Until that moment, it never occurred to Jenkins—who grew up across the street from Newark's Stella Wright housing projects and

didn't know anyone who'd been to college—that this could be a career path for him.

> "He knew I was curious, so he would tell me what tools he was using and later he'd quiz me on what I remembered and he told me how smart I was. He made me feel so empowered, like I could do this," recalls Jenkins. "It

helped me realize that the world was bigger than the block where I grew up. It made my dreams bigger."

After graduating from Seton Hall, Jenkins enrolled in RSDM, graduating in 1999. He went on to co-found The Three Doctors Foundation, based on a pact formed with two University High School classmates as a result of his ortho visits. Together, he and the other members—Drs. Sampson Davis and Rameck Hunt—vowed they would support each other to realize their dream of completing medical school and dental school. Since its founding, the foundation has provided support and encouragement to thousands of kids growing up in neighborhoods like their own.

Jenkins has a long history with RSDM. He completed a General Practice Residency here and received a certificate in Oral Medicine. From 2002 to 2006, he was a faculty member and also served as director of Multicultural Affairs.

Presently, he's a faculty member at Columbia University College of Dental Medicine but still maintains ties to RSDM, inviting students to participate in Three Doctors programs in Newark and speaking at events hosted by RSDM's student clubs and associations.

When working with patients, he still tries to follow the example of his original mentor—the resident who gave him braces in the late 1980s. "I use the dental chair to inspire students whenever they come. I try to mimic what he did."

Nobel Biocare donates equipment, like this dental kit, to RSDM.

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We're greatly indebted to **Dr. Anthony R. Volpe,** a member of RSDM's first graduating class, circa 1960. One of his most recent gifts is an endowed scholarship for economically disadvantaged students.

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TIMELINE 2017

JANUARY Oral Radiology students visited the Camden Street School in Newark to stress the importance of oral hygiene during

> pregnancy and infant/ toddler tooth decay caused by baby bottles. Ten RSDM students were part of the community health fair. It's one of several outreach efforts in the city of Newark, RSDM's home base.

FEBRUARY RSDM served as the nationwide site of Give Kids a Smile's (GKAS) 15th anniversary celebration. Nearly 400 children from Essex County grade schools received free examinations, fluoride treatments and oral hygiene tips. RSDM has been holding the event, sponsored by the American Dental Association (ADA), since it began.





MARCH The Balbo Day exposition showcases students' best research projects, from fascinating case studies to research on cancer treatment and chronic pain. They learn that communication skills, and good poster graphics, can be just as important as their hypotheses.

APRIL The School of Dental Medicine and New Jersey Medical School battled each other on ice for a worthy cause: Smiles Across Bangladesh. Funded by the Rutgers



Foundation, the trip allows medical and dental students to collaborate on cleft lip and palate surgery for patients overseas. They raised nearly \$9,000 for the mission. MAY The Class of 2017 said goodbye to the title "student doctor" and embarked upon their professional journey. At a convocation ceremony held at NJPAC in Newark, 117 graduates became DMDs. The eclectic class included a firefighter, a radio disc jockey, a Bollywood dancer and a grad who once operated the scoreboard at Yankee Stadium.

JUNE RSDM published its first research journal, the Rutgers Journal of Dentistry, created by a team of students who peerreviewed, selected, and edited articles written by colleagues. Topics included new treatments for trigeminal neuropathy and diagnosing developmental tooth anomalies with cone beam computed tomography.



JULY RSDM welcomed undergraduate students interested in dentistry for the Summer Health Professions Education Program (SHPEP). It's designed to boost the number of underrepresented minority students enrolling in a health professions school but also includes students from a range of ethnicities and socioeconomic backgrounds.



AUGUST Students spent a week treating Native American patients at the federally run clinic in Arizona, a tradition that dates back to 2004. Before they arrived, students learned about Native American culture to help them understand the best ways to offer treatment.



SEPTEMBER The Class of 2021 took a symbolic step from students to student doctors at the annual White Coat Ceremony, which represents the responsibilities and rewards of caring for patients.

OCTOBER RSDM proves there's nothing scary about a Halloween visit to the dentist. In our pediatric clinic, student doctors, faculty and staff dressed up as everyone from Snow White and the Little Mermaid to characters from "Frozen."



NOVEMBER RSDM faculty Drs. Harry Zohn and Larry Dobrin, both forensic dentists, were part of a federal team that travelled to Puerto Rico in the aftermath of Hurricane Maria. As citizens struggled without power and electricity, they helped identify victims and bring closure to families.



DECEMBER Students celebrated Cultural Night, hosted by RSDM's eight culture clubs, which reflect its status as one of the most diverse dental schools in the nation. More than 100 students turned out for a potluck that included Korean fried pancakes from the Asian Student Dental Society, chicken and plantains from the Hispanic Student Dental Association, and many more.

FINANCIALS



	\mathbf{h}	2017 ACTUAL	PERCENT
	Salaries and Wages	\$36,231	47.9%
	Housestaff Salaries	\$1,383	1.8%
	Fringe Benefits	\$10,571	14.0%
	Non-Salary	\$12,919	17.1%
	Other Operating Expenses	\$1,922	2.5%
	Interunit Transfers	\$240	0.3%
	Central Administration Cost Pools	\$12,385	16.4%
	Total Expenses	\$75,650	100.0%

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