

Crossing Borders to Fight Noma

Disease has no borders, and as a World Health Organization (WHO) Collaborating Center for Oral Infectious Disease, the School of Dental Medicine's research and educational resources cross many. In the past year, such efforts have taken Dr. Peter Berthold, Associate Dean of International Relations and Chair of Dental Care Systems, to sub-Saharan Africa, as part of a WHO and National Institutes of Dental and Craniofacial Research (NIDCR) team working to help fight noma, an acute gangrenous disease of the oral cavity affecting Africa's children.

In November 2000, Dr. Berthold and Dr. David Barmes, a specialist in international health issues from Geneva, traveled to Niger in Northwest Africa to evaluate the present status of the country's noma prevention project.

"We traveled to very remote areas and spoke to the people who have set up noma houses for care and education," explains Dr. Berthold. "In Niger, several nongovernmental organizations are supporting noma projects, and in conjunction with WHO, the government has also increased its involvement in the fight against the disease."

While such efforts are beginning to have a positive impact in Niger, WHO reports that the prevalence of noma is increasing in countries throughout the sub-Saharan region. Though reliable statistics are difficult to gather, the incidence in this region is estimated to be between 100,000 and 140,000 new cases each year with a prevalence of between 700,000 and 1 million cases.

Noma, or cancrum oris, is a necrotizing disease that most often affects children under the age of 6. Derived from the Greek "nomein," which means "to devour," noma starts in the oral cavity as the periodontal infection acute necrotizing gingivitis (ANG) or, when at a more advanced stage, acute necrotizing ulcerative gingivitis (ANUG). If a child with ANG/ANUG is left untreated, the localized periodontal disease can rapidly progress to noma, which can eat away both hard and soft facial tissue with devastating speed and outcomes. The noma mortality rate is as high as 80 to 90% and death often occurs within a few weeks after the onset of the disease; the children die from the infection, sepsis, and/or a collapse of the system. For unknown reasons, the disease does sometimes stop at varying stages and the child may recover, but often with

serious tissue damage, including disfigurement and poor oral function affecting both speech and eating.

If diagnosed at an early stage, progression can be stopped with the use of antibiotics, such as amoxicillin. Immediate nutritional intervention is also needed. Unfortunately, most cases are not receiving any treatment.

"It is believed that less than one child in ten will get treatment that may prevent massive tissue destruction or death," notes Dr. Berthold. "The reluctance to bring the child to a health care station is often based in superstition, misinformation, or no information at all."

Consequently, much of the current work being done in the fight against noma involves public education. In Niger, for example, Dr. Berthold explains that Western medicine groups are trying to work with traditional healers, so once the disease is identified, they will help to get the children to the nearest primary care station for antibiotic treatment. Parental education to the signs and causes of noma is another paramount goal of the prevention program.

"The awareness program in the area is very difficult, because you are dealing with very rural communities with extremely limited access to health care," notes Dr. Berthold. "In addition, many times when a child gets the disease, it is looked on as a curse that has been cast on the family or the entire village, so parents will often hide the child and he or she will consequently die."

While noma is an ancient disease – probably described first by the ancient Greeks and later in the 16th century and documented on every continent – it remains a relative mystery. The precise pathogens of noma have not been identified, and it is not clear if the disease is purely a bacterial infection or if there is a viral component in the initial stages, explains Dr. Berthold. He adds, however, that some NIDH/WHO research, led by Dr. C. Enwonwu from the University of Maryland in Baltimore, has pointed to *Prevotella intermedia* as the predominant isolate in the malnourished children as compared to the healthy children and *Fusobacterium necrophorum* as a likely cause of the noma necrosis.

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"Noma is mainly a disease of poverty and malnutrition, with a number of other environmental and behavioral factors also playing a role," says Dr. Berthold. "Etiological factors include, but may not be limited to, immune suppression, poor hygienic situations, measles, and living in close proximity to domestic animals."

In its efforts to address noma, WHO has established a five-point strategy that involves prevention, epidemiology and surveillance, etiological research, primary health care, and surgery and rehabilitation.

In addition to Dr. Berthold's site visit to Niger, his work to date on this project has involved participating in a WHO working conference on noma, held in April 2001 in Harare, Zimbabwe. He and a group of investigators including Dr. Naty Lopez, Assistant Dean of International Relations, and others from SDM, Penn, and collaborating Universities have also

conducted a prevalence survey in remote areas near Phalombe, Malawi, and Dr. Francis Mante, Associate Professor of Restorative Dentistry, conducted an evaluation of hospital records in Accra, Ghana.

The project has suffered a temporary setback with the sudden death of Dr. Barmes in January of 2001. Dr. Berthold is tentatively scheduled to return to Africa this November to continue the work. This trip would involve a visit to a northern Nigeria hospital that is dedicated to noma children, and a possible return to Niger.

"While preventable, noma is a multifaceted disease that requires investigation across many boundaries," adds Dr. Berthold. "One of our key goals is to draw attention to noma and inspire the commitment of resources and research to a devastating illness that has typically received little attention from Western medical institutions." ■

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AEGD Program Implements Changes to Enhance Depth, Breadth

The School's Advanced Education in General Dentistry Program is being reviewed and enhanced under the direction of Dr. Richard Cassie, who recently joined SDM as the program's new coordinator. Dr. Cassie, who assumed this post in March 2001, brings extensive experience in postdoctoral training to this role, along with 35 years of experience in private practice. A past chairman of the Dental Department at Morristown Memorial Hospital, Morristown, NJ, he helped to establish a general dentistry residency there nearly 25 years ago and was active in its ongoing growth and development. Dr. Cassie is a 1961 graduate of SDM.

"The School's AEGD program is unique in that residents work within the group practices of the Dental Care Network, gaining extensive clinical experience in a true practice setting," says Dr. Cassie. "It already is a very strong program that I hope to help build upon." Dr. Cassie has directed much of his efforts thus far on reviewing and developing the seminar/didactic element to enhance the depth and breadth of topics covered with an eye for practical application in private practice. "The general dentist by definition needs to have a strong foundation in all areas – from implants and esthetic dentistry to endodontics and periodontics," explains Dr. Cassie. "So, one of our goals is to reinforce their knowledge and skills in such areas and align the coursework to support and supplement their clinical dentistry. A main focus overall is on patient management – diagnosis and treatment planning – to ensure they are prepared to provide comprehensive patient care."

The 2001-2002 seminar schedule for the class of AEGD residents that started in July reflects some these new initiatives. (continued on page 3)

SDM Hosts Hispanic Dental Association Student Meeting

On Sunday, October 7, the School of Dental Medicine hosted the student/new professionals portion of the 9th Annual Meeting of the Hispanic Dental Association, held in Philadelphia October 5 through 7.

"All SDM students were invited to participate in the three-day conference with registration being subsidized by the School. The program being held at Penn allowed students not able to attend all three days of the meeting to take advantage of the student-specific component," notes Susan Schwartz, Director of Student Affairs. "With the meeting being held in Philadelphia this year, we also had the opportunity to showcase our School by hosting this part of the program."

Featured among the day's program was a presentation by Melissa Lopez (D'02) and James Morrison (D'03), who reported on the diversity symposium they organized at SDM in April 2001. With the goal of stimulating dialogue and a plan of action on how to increase the number of minority students in dental schools, that symposium drew 32 representatives from eight dental schools in the mid-Atlantic region. Ms. Lopez and Mr. Morrison shared (continued on page 3)



Bridging the Gaps Interns Learn from, Support the West Philadelphia Community

This summer, SDM students helped to build oral health awareness throughout the West Philadelphia community as part of Bridging the Gaps, a seven-week, multidisciplinary internship program that places students from different schools and fields of study in a diverse group of community-based organizations.

The program brings together students of dentistry, medicine, law, nursing, social work, and the allied health professions to provide health-related education that supports the programs and services of the participating organizations. Along with the University of Pennsylvania, other participating schools include Bryn Mawr College, La Salle University, MCP Hahnemann University, Philadelphia College of Osteopathic Medicine, Temple University, Thomas Jefferson University, and University of the Sciences in Philadelphia. This is the tenth year that SDM has been involved in Bridging the Gaps.

“SDM had a strong presence in this year’s program,” notes Dr. Joan Gluch, Director of Community Health. “Fifteen students participated, which was nearly double that of last year. In addition, we increased the oral health component of the program, providing an orientation to all the participating schools on oral health issues and adding another faculty member to advise students on completing their oral health promotional activities.” This added support of the oral health element of Bridging the Gaps was made possible by a grant from the Commonwealth of Pennsylvania.

Throughout the internship, students work four days a week at their community site and meet as a group for discussions on public health issues and related topics each Wednesday. In developing their specific program activities, they work with a faculty member and site preceptor to target the most appropriate health promotion activities and services for their respective organizations. This year, there was a particular emphasis on the issue of violence in communities – students and faculty members had required readings on the topic and incorporated related issues into the program of activities presented at the community sites.

“The main goal of our student team was to increase the children’s awareness of the importance of health and safety, and to provide them with the knowledge, skills, resources, and motivation they need to improve their health,” explains Lee-Ann Shiroma, a Bridging the Gaps intern at the Southeast Asian Mutual Assistance Associations Coalition, Inc. (SEAMAAC). SEAMAAC is a non-profit organization, comprised of five member agencies, which serves the Southeast Asian refugee and immigrant community. Ms. Shiroma, teamed with a Penn nursing student and a medical student and physical therapy student from Thomas Jefferson University, worked at the two summer day camps operated by SEAMAAC, providing

instruction to children between the ages of 5 and 12 on various health and safety topics.

“Bridging the Gaps taught me that dentists play an integral part in community health. Oral health and hygiene are far too often neglected, especially in low-income communities, but the children showed a strong desire to improve their oral health once they were provided with dental supplies and instructions,” notes Ms. Shiroma. “By simply participating in health education programs, dentists can dramatically improve the oral health of a community. As professionals, dentists have the responsibility to reach out into their communities and help those in need.”

For Alika Crew (D’04), getting to know the people of the West Philadelphia community was one of the greatest rewards of her Bridging the Gaps experience. “I loved it. I would definitely recommend the program to others,” she notes. “It gave me a new perspective on the West Philadelphia community, and helped me to appreciate the people in it more. I think that anyone in the health professions or any other profession that will be working with people from this community would benefit from getting to know them and what they need before working with them in a clinical setting.”

Ms. Crew worked with a Penn medical student at the Injury Free Coalition of Philadelphia, based out of Children’s Hospital of Philadelphia. The main focus of the Coalition is to help reduce preventable injury in West Philadelphia, which is very high among children. Ms. Crew and her partner presented home safety workshops at various community centers and also helped to distribute bike helmets to children in the community. “In planning activities, our key goals were not only to teach the participants about home or bike safety, but also to encourage them to tell others about what they learned,” explains Ms. Crew.

The immersion in the community and the opportunity for interdisciplinary contact with students and professionals in other fields are the hallmarks of the Bridging the Gaps program that participating students continue to value, stresses Dr. Gluch. The other students participating this past summer included Matthew Applebaum and Erika Johnston at Pepper Playground, Sarah Sibbach at Drew Summer Camp, Jonathan Johnson at the Health Annex at Myers Recreation Center, Jessica Lorusso at Spectrum Health Services, Stanley Montee at Manna, Tracey Rubinsohn at Haddington Townhomes Camp, Elizabeth Scala at Horizon House, Carol Testa at Kids Come First, Andrea Woods at Mitchell Family Center, Sara Rashedi at the Philadelphia School District, Michelle Yong at Covenant House, and Aimee Hersh at McMichael Family Center. ■

Hispanic Dental Association *(continued from page 1)*

the outcomes of the symposium, including attendees’ views on the role of dental students in recruitment and retention and the recommendations that can be made to dental school admissions committees to strengthen minority representation.

“Many great ideas came from our dialogue and were pleased to have the opportunity to share those ideas with others to affect change,” says Ms. Lopez. “We hope that, with the information that we provided to the Annual sessions’ participants to take home with them, they might begin implementing these initiatives.” In follow-up to the SDM diversity symposium, a second one is scheduled for this spring and will be hosted by the students of the University of Medicine and Dentistry of New Jersey.

“The meeting organizers were very impressed with Melissa and Jimmy’s initiative and eager to have them be part of the program,” says Ms. Schwartz. “The hope is that their findings will be a springboard to a national effort among dental students to organize and participate in efforts to increase minority representation in dental schools and the profession at large.”

Dean Raymond Fonseca presented the opening remarks for the day’s program, and as the day’s host, SDM provided attendees with breakfast as well as bus transportation from the Crowne Plaza Hotel, where the rest of the meeting was held. ■

AEGD Program *(continued from page 1)*

Among the new courses are Preclinical Endodontics, a proficiency lecture, and Implant Treatment Planning with SIM/PLANT Software. Dr. Cassie notes that by inviting company representatives to talk about their products, whether they are implants or impression materials, students are able to see and handle items, ask direct questions about their application, and build their understanding of them on a first-hand basis.

To strengthen practice management skills, Dr. Cassie has also added Business Planning

and the Legal ABC’s of Dental Practice to the seminar schedule.

Also new to this year’s academic schedule is the reestablishment of the AEGD Journal Club. In it, residents review articles from the leading dental journals on a wide range of topics, providing a forum for discussion and analysis of the current issues affecting and guiding dentistry. A number of the residents’ reviews are also being posted on InteliHealth Dental Professional (<http://www.dentalpro.intelihealth.com>), the professional informational and educational web site the School

James Morrison Elected to National Post

James Morrison (’03) has been named president elect of the national chapter of the Student National Dental Association’s (SNDA), the student arm of the National Dental Association, the nation’s largest and oldest organization of minority oral health care professionals. Mr. Morrison’s post begins three years of service with the SNDA, including one year as president elect, one as president, and a third as immediate past president.

Mr. Morrison notes that he has identified three key priorities he plans to pursue in his role with SNDA – community outreach to minority children, minority recruitment, and professional transition.

“With respect to my participation on the national level, one of the things I am eager to do is to form a partnership with Head Start,” explains Mr. Morrison. “I am excited about pushing this into action because I think it is important to reach minority children at a very young age, so they understand the importance of dental health.” He will work with SNDA chapters throughout the country to establish oral health promotion activities with their local Head Start programs.

In looking at minority recruitment to dental schools – the focus of a diversity symposium Mr. Morrison and Melissa Lopez (’02) organized at SDM last April – Mr. Morrison notes that one issue that needs to be addressed is the black community’s perspective on oral health, and thus, the profession of dentistry. “We have found that there are limited avenues for young people to explore dentistry as a profession,” he notes. He hopes to work with SDNA to develop awareness and educational programs.

Mr. Morrison also commented that believes the SNDA can strengthen its ties with practicing minority dentists through mentorship programs and better support graduates as they transition to their professional lives. ■

has established through its partnership with InteliHealth.

“I am delighted to be working with the School in this new capacity and very appreciative of everyone’s support as we work together to strengthen and enhance our program,” adds Dr. Cassie. “The bottom line is that we want to make this the best program in the country. We want to ensure our students leave here June 30 with the confidence, skills, and knowledge they need for effective patient care and successful practice management.” ■

Summer Research Program Gives Hands-On Experience

This summer, SDM’s long-standing Summer Research Program gave 19 students a unique opportunity to gain hands-on research experience. “Now in existence for over 20 years, the program owes much of its ongoing success to the tireless efforts of the faculty who continue to support it through their participation as preceptors,” says Dr. Joseph DiRienzo, Assistant Dean of Student Research and Associate Professor of Microbiology. “As in prior years, some faculty members carried more than one student.”

Such was the case with Dr. Linda Otis, Associate Professor of Oral Medicine and Director of Oral and Maxillofacial Radiology, who was a preceptor for the first time this summer, her first summer with SDM. “I think it is important to involve students in research so they see that we make clinical decisions based on science,” notes Dr. Otis. Carlos Huerta (’04) worked with Dr. Otis on a project entitled “Inter-rater reliability in the assessment of radiographic indicators of alveolar bone destruction” and Anthony Liberatore (D’04) worked on “A validation study of quantitative LASER fluorescence for diagnosis of pit and fissure caries.” Both Mr. Huerta and Mr. Liberatore have submitted abstracts of their work for possible presentation at the International Association of Dental Research Meeting, being held March 6 through 9 in San Diego.

Rene Lukasiewicz (D’03), who participated in the research program both this summer and last, found the chance to gain a comprehensive understanding of the research process among the most valuable parts the program. “I learned a lot,” says Ms. Lukasiewicz. “I designed my own experiment and what I thought would happen, didn’t, so it really gave me a realistic view of research.” Her project was entitled “Analysis of the response of human oral cells to the cytolethal distending toxin of *Actinobacillus*

actinomycetemcomitans” (Dr. Joseph DiRienzo and Dr. Jonathan Korostoff, preceptors). Her work this summer was a continuation of the same project from the previous year.

Strongly recommending the research program to other SDM students, Shawn Miller (’04) was impressed with the depth and breadth of research options. Ultimately, he chose to work with Dr. Richard Doty of the Hospital of the University of Pennsylvania Smell and Taste Center on a project entitled “The effects of tongue area on electrical taste thresholds.”

“The program gave me a wonderful opportunity to select from an extensive collection of research topics,” says Mr. Miller. “It gave me a chance to work in a hospital environment and interact with professionals in other fields, such as neuropsychology and otorhinolaryngology. It was a very rewarding experience, and also a very intellectually challenging one.” Mr. Miller has submitted a manuscript on his research project to the journal *Physiology and Behavior*.

Following is a list of the other SDM students in this year’s program:

- Boris Babiner (D’04), *Using function-blocking antibodies to evaluate integrin roles in cell attachment and osteogenesis*, Dr. Phoebe Leboy, preceptor
- Jennifer Beaudin (D’04), *Onset of temporomandibular disorders (TMD) in the human female during pregnancy*, Dr. Scott DeRossi and Dr. Thomas Sollecito, preceptors
- Vinamra Bhasin (D’02), *Effect of eugenol-containing and eugenol-free temporary cements on microleakage in resin bonded restorations*, Dr. Zahra Afsharzand, preceptor
- Thuylinh Huynh (D’04), *The role of matrix vesicle collagenase in matrix vesicle-mediated calcification of the matrix*, Dr. Ellis Golub, preceptor
- Stella Cheung (D’04), *Purification of*

MG2 for anti-HIV study, Dr. Daniel Malamud, preceptor

- Bridget Chow (D’04), *Identification of anti-HIV components of salivary agglutinin*, Dr. Daniel Malamud, preceptor
- Robert Christy (D’04), *Research proposal for investigating the function of the protein ORF-3 derived from an alternative transcript of the type III collagen gene*, Dr. Sherrill Adams, preceptor
- David Dieu (D’04), *The promising role of F18-FDG PET in detecting periodontal disease*, Dr. Abass Alavi, preceptor
- Deborah Gortler (D’04), *Evaluation of quality assurance of a predoctoral endodontic program*, Dr. Yi-Tai Jou, preceptor
- David Herman (D’03), *A continuation of a prospective study evaluating the presence of temporomandibular disorders in a cohort of patients referred to a neurology clinic for evaluation and treatment of headache*, Dr. Scott DeRossi, preceptor
- Daniel King (D’03), *Prevalence of oral infection among adult HIV/AIDS patients in the age of protease inhibitors as compared to NON-HIV patients*, Dr. Michael Glick, preceptor
- Ari Krug (D’03), *Mechanisms of chemokine gene expression in leukocytes*, Dr. Hydar Ali, preceptor
- Joseph Lamendella (D’04), *The effects of implant materials on integrin expression*, Dr. Mamle Mante and Dr. Phoebe Leboy, preceptors
- Jane Lu (D’04), *Effects of retinoic acid on chondrocyte maturation*, Dr. Sherrill Adams, preceptor
- Aaron Miller (D’04), *Management of mucositis in bone marrow transplant patients*, Dr. Martin Greenberg, preceptor

SDM funds much of the Summer Research Program through its Office of Student Research. The NIH also provides support of the program. Additional information on the program is posted under the Student Research section of the School’s web site. ■