

NORTH DAKOTA MEDICINE

THE UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE & HEALTH SCIENCES

Stemming the Tide

UND's Women in Science group
aims to patch the leaks in the
STEM workforce pipeline.

Golden Opportunity

Penguin Revolution

Setting Research Roots

Charting the Undiscovered Country

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UNIVERSITY OF NORTH DAKOTA
SCHOOL OF MEDICINE AND HEALTH SCIENCES

ROBERT O. KELLEY, President, University of North Dakota

JOSHUA WYNNE, Vice President for Health Affairs and
Dean, School of Medicine and Health Sciences

EDITOR Denis MacLeod
WRITERS Kristine Henke, Denise M. Korniewicz,
 Denis MacLeod, Aaron Ortiz,
 Juan Pedraza, David Relling,
 Mark Romanick, Jessica Sobolik
CONTRIBUTORS Kristen Peterson
GRAPHIC DESIGN Laura Cory, John Lee, Victoria Swift
PHOTOGRAPHY Aaron Ortiz, Jessica Sobolik,
 Wanda Weber
COVER ART Wanda Weber

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WEBMASTER Eric Walter

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UND School of Medicine and Health Sciences

Office of Alumni and Community Relations, Attn: Kristen Peterson
 501 North Columbia Rd. Stop 9037, Grand Forks, ND 58202-9037

E-mail: kristen.peterson@med.und.edu

Phone: 701-777-4305

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On the Move!



Much is happening at the School as we prepare to train the next generation of health care providers for North Dakota and the region. Exciting new programs are being developed, and there is positive energy throughout the four campuses of the School and at our regional sites throughout the state. Here's an update on some of the activities at the School grouped by people, programs, and facilities.

People

We have been able to successfully recruit four basic science faculty members to join us this year. Interestingly enough, all of the finalist candidates have spouses who are also biomedical scientists! This certainly is a strong trend around the country—families composed of professional spouses, both of whom require good jobs. Congratulations are in order to the Basic Science Search Committee, chaired by Dr. Ann Flower, for its excellent work in coordinating the recruitment efforts.

The search firm of Witt/Kieffer is assisting the SMHS in four important searches: chair of the basic science department; associate dean for Student Affairs and Admissions; director of the Master of Public Health program; and the Eva Gilbertson MD chair of geriatrics. The Witt/Kieffer team has already met with a wide spectrum of faculty members and will meet with others as the process proceeds. We hope to have initial visits with potential candidates by late fall.

The School has been involved in a variety of programs designed to help fill the health professions workforce pipeline. For example, forty-six undergraduates obtained research experience this past summer at the School through four programs: two funded by the National Institutes of Health, one by the National Science Foundation, and one by the

School. In addition, the Research Experiences for Medical Students program is flourishing, with the largest group ever (14) participating in research this past summer.

Graduate and medical student research was the highlight of the 31st Annual Frank Low Research Day. Participation at this annual celebration of the research accomplishments of trainees has nearly doubled over the past three years. There was strong attendance from UND's College of Nursing and the School of Engineering and Mines, the Grand Forks Human Nutrition Research Center, the Department of Biochemistry at North Dakota State University, and others.

We continue to work closely with the UND College of Nursing on both practical and strategic levels. I am proud to note that Denise M. Korniewicz, PhD, RN, FAAN, the new dean of the College of Nursing, has prepared an interesting article as our guest author for this issue of *North Dakota Medicine*.

Programs

Planning for the new Master of Public Health program is well underway. Since the program is a joint one with NDSU, we have constituted an executive committee and five subcommittees that are made up of representatives from UND, NDSU, and the ND Department of Health. We hope to welcome the first cohort of students in the fall of 2012.

The School's research enterprise continues to grow and expand. Two faculty members have received notification that their grants have been funded by the National Institutes of Health (NIH), which is particularly noteworthy in the currently very tight funding environment. Dr. Catherine Brissette, assistant professor of microbiology and immunology, has been awarded a K-22 grant, which is an award designed to facilitate the

transition from a postdoctoral to an independent research position. Dr. Brij Singh, associate professor of biochemistry and molecular biology, renewed his R01 grant in the amount of \$1.73 million over five years! An R01 grant is the original and oldest of the NIH's funding mechanisms, and is arguably the most prestigious. With this grant, Dr. Singh will continue his studies of the control mechanisms involved in the movement of the element calcium across the cell membrane. Calcium is essential for proper cellular function in various tissues, and derangements in its movement may be involved in neurodegenerative disorders such as Parkinson's and Alzheimer's disease.

Facilities

The Center for Family Medicine clinic building in Bismarck is nearing completion, with the project continuing under budget. The opening of the building is now scheduled sometime during this coming winter (what a time for a grand opening!), but the building will be a marvelous addition to the downtown Bismarck medical campus.

During the last legislative session, a space study of the School was authorized and funded. Through a competitive bidding process, the firm of JLG Architects was hired to evaluate the facility needs of the School, particularly in view of the class size expansion that is underway. We have long maintained that we need another building to accommodate our growth, and we look forward to the conclusions of the JLG space study.

If you are in the area, please stop by. I'd love to show you around our beautiful campuses here in Grand Forks and elsewhere in the state.



Joshua Wynne, MD, MBA, MPH
UND Vice President for Health Affairs
and Dean



Catherine Brissette



Brij Singh

Jackson picked for national medical education post

Jon Jackson, PhD, assistant professor in the Department of Anatomy and Cell Biology at the University of North Dakota School of Medicine and Health Sciences, has been elected to a three-year term on the Educational Affairs Committee of the American Association of Anatomists. He was nominated by AAA President Jeffrey Laitman. Members of the Educational Affairs Committee are responsible for planning the education and teaching content for the AAA's annual meeting, provide content for the AAA's Education & Teaching Tools website, and carry out other education-related projects.

Members of the American Association of Anatomists are the principal educators of medical students in their first year of medical school and work in imaging, cell biology, genetics, molecular development, endocrinology, histology, neuroscience, forensics, microscopy, and physical anthropology. Founded in 1888 for the "advancement of anatomical science," the AAA, via research, education, and professional development activities, is the professional home for an international community of biomedical researchers and educators focusing on anatomical form and function.

Jackson, a member of the School of Medicine and Health Sciences faculty since 1998, has served in a leadership capacity with all three major North American anatomical science organizations: the American Association of Anatomists, the Human Anatomy & Physiology Society, and the American Association of Clinical Anatomists. He currently teaches human anatomy to undergraduate, graduate and medical students, as well as courses in scientific writing, responsible conduct of research and the history of science.

Jackson earned bachelor's degrees in chemistry and biology from Luther College, Decorah, Iowa, and master's and doctoral degrees from UND. He did a postdoctoral fellowship in cell biology and biochemistry at Vanderbilt University, where he served on the medical faculty.

Mitchell cited in new study of bariatric surgery, and he is a member of international scientific team studying the genetics of eating disorders

James E. Mitchell, MD, Chester Fritz Distinguished Professor and chair of the Department of Clinical Neuroscience at the University of North Dakota School of Medicine and Health Sciences, was cited by the American Society for Metabolic and Bariatric Surgery in its announcement of a new study on the effects of depression and anxiety on weight



Jon Jackson

loss after bariatric surgery. Read more at <http://bit.ly/lAt5QB>

In addition, Mitchell is a member of an international team of scientists, led by researchers at the University of California, San Diego School of Medicine and the Scripps Translational Science Institute in La Jolla, Calif., who have identified possible genetic variations that could influence a patient's recovery from an eating disorder such as anorexia or bulimia. Read more at <http://bit.ly/r6WGRB>

SMHS inducts Gold Humanism Honor Society members

Eight senior medical students from the Class of 2012 at the University of North Dakota School of Medicine and Health Sciences were inducted into the Gold Humanism Honor Society on Thursday, June 16. Keynote speaker Rolf Paulson, MD, clinical professor of Internal Medicine and Family and Community Medicine, provided an inspiring commentary on the importance of community to the humanistic physician.

In 2009, the UND chapter joined seventy-two other medical school chapters across the country in recognizing senior medical students who demonstrate exemplary humanism and professionalism throughout their medical education. Creation of the chapter was made possible by a grant from the Arnold P. Gold Foundation.

The Class of 2012 inductees were selected through a process that included peer nomination and subsequent confirmation by the School's Gold Humanism Honor Society Oversight Committee. Each student's clinical performance and record of community service was considered.

Inductees from the Class of 2012 include

- Elizabeth Blixt
- Mark Detwiller
- Chris Irmen
- Robert Marshall
- James Miles
- Rochelle Palmiscno
- Meredith Reisenauer
- John Wagener

"We are very pleased that our medical school formally recognizes the importance of humanism in delivering quality medical care," said Nicholas Neumann, MD, MMM, interim associate dean for Student Affairs and Admissions. "We congratulate these students on their commitment to patient care and dedication to the medical profession."

UND's INMED program featured in AAMC Reporter

Reporter Whitney L. J. Howell featured UND's INMED program in her article titled "Medical Schools Reach Out to Native American Groups" in the Association of American Medical Colleges' July *AAMC Reporter*. Read more at <http://bit.ly/nhX0wG>



James E. Mitchell

Understanding the antiepileptic benefits of a ketogenic diet

Jonathan Geiger, PhD, Chester Fritz Distinguished Professor and chair of the Department of Pharmacology, Physiology, and Therapeutics at the UND School of Medicine and Health Sciences, is a member of the research team that has identified the molecular mechanism responsible for the antiepileptic effects of a ketogenic diet, a high-fat, low-carbohydrate diet similar to that commonly referred to as "Atkins." Read more at <http://bit.ly/iNeuqX>



Jonathan Geiger

North Dakota Quality Network supports rural hospitals to attend national conference

Three health professional leaders from rural hospitals in North Dakota took part in the National Rural Quality and Clinical Conference with funds provided by the North Dakota Rural Hospital Medicare Flexibility (Flex) program, administered by the Center for Rural Health at the University of North Dakota School of Medicine and Health Sciences.

Shawn Smothers, CEO, Kenmare Community Hospital, Kenmare; Paula Brown, quality improvement coordinator, McKenzie County Healthcare System, Watford City; and Stacy Chadwick, quality assurance and medical staff coordinator, West River Health Services, Hettinger attended the national conference on behalf of the ND Critical Access Hospital Quality Network.

As recipients of the scholarships for the Rural Quality and Clinical Conference, these individuals interacted with professionals from other critical access hospitals (CAHs) around the nation. Brown, Chadwick, and Smothers shared the information they learned from this conference with the other CAHs in North Dakota.

SMHS departments collaborate on retinal degeneration research

SMHS researchers Othman Ghribi, PhD, and Brij B. Singh, PhD, were among the authors of an article in the journal *BMC Ophthalmology* that describes the effects of a cholesterol-enriched diet on age-related macular degeneration in the retina.

Ghribi, who was the lead author and formulated the hypothesis for the research, is an associate professor in the Department of Pharmacology, Physiology, and Therapeutics; and Singh is an associate professor in the Department of Biochemistry and Molecular Biology. Bhanu Dasari, a doctoral student mentored by Ghribi, conducted most of the bench work. Ghribi also had Jaya R. P. Prasanthi, a post-doctoral student, and Gurdeep Marwarha, a doctoral student, contribute to the research effort.

New UND forensic clinical practice facility will help educate more students and better serve the region

The UND School of Medicine and Health Sciences opened its new forensic science clinical practice facility for its Department of Pathology on July 6.

Mary Ann Sens, MD, PhD, Chester Fritz Distinguished Professor and chair of the Department of Pathology at the SMHS, said the new clinical site will enable all medical and health sciences students to rotate through in groups of six to ten students daily. The former clinical site could accommodate only one or two students.

"We had outgrown the former clinical site at Altru Hospital," Sens said. "Altru has been a long-standing partner and will continue to be a partner of the Department of Pathology; they have been very generous in providing clinical space for our clinical practice and education of our students."

Tim Weiland, MD, of Altru's Pathology department said, "There is a nationwide shortage of clinical laboratory professionals. We are proud to support UND and its students in their interest in the field. The new forensic science clinical practice facility will be a benefit to our community and encourage more professionals in the field, and we look forward to a continuing partnership."

Sens said the new facility meets NAME inspection and accreditation standards. NAME is the national professional organization of physician medical examiners, medical death investigators and death investigation system administrators who perform the official duties of the medicolegal investigation of deaths of public interest in the United States. Moreover, the new morgue in the facility will enable staff to work with transplant and donation agencies to honor any family wishes.

In addition to serving more students, the new facility will benefit Altru and other hospitals throughout the region by relieving the burden of performing autopsies, which will free assets at those hospitals to meet other health care needs. The facility has the capacity for performing medical, legal and forensic investigations throughout the Red River Valley and currently provides services to Kittson, Mahnomen, Marshall, Red Lake, and Norman counties in Minnesota in addition to Grand Forks County. The new location and local provision of these services will provide a quicker turnaround for police and other investigative agencies and, most importantly, serve North Dakota families at a time of need.

Mark Koponen, MD, a forensic pathologist, Minot native, and alumnus of both NDSU and the UND SMHS, will serve as co-director for the clinical facility. Koponen completed his pathology residency in New Mexico; he then went to work for the Georgia Bureau of Investigation.

"Without a new facility, we couldn't have recruited Dr. Koponen and his family back to North Dakota," Sens said.

SMHS research paper among the top in biological and medical sciences

Faculty of 1000 (F1000) has identified a paper produced by the faculty in the Department of Pharmacology, Physiology, and Therapeutics at the University of North Dakota School of Medicine and Health Sciences as being within the top 2 percent of all published articles in the biological and medical sciences. Saobo Lei, MD, PhD, an associate professor, was the lead author.

Lei's work at the SMHS focuses on how individual neurons behave at the cellular level, work that eventually could lead to a better understanding of brain problems, such as memory loss, learning disabilities, anxiety, Alzheimer's and epilepsy. He and his coauthors explored a neural receptor's tight control over spatial learning. The article was originally published in the peer-reviewed journal *Neuron* at <http://bit.ly/qfsuWa>.

F1000 identifies the most important articles and trends across biology and medicine. Articles are selected from those in over 3,000 peer-reviewed scientific journals, which are then rated and evaluated by F1000's peer-nominated faculty of over 10,000 expert clinicians and researchers who explain why the papers they recommend are essential reading.



Saobo Lei

Intellectual harvest: UND summer undergraduate biomedical researchers present findings

The 2011 Summer Undergraduate Biology Research poster session took place at the School of Medicine and Health Sciences on August 11 in the Vennes Atrium of the School. For the previous 10 weeks, students from UND, as well as rural and tribal colleges, had conducted research and participated in a number of related educational opportunities. Faculty from the School's departments of Anatomy and Cell Biology; Biochemistry and Molecular Biology; Pathology; Pharmacology, Physiology and Therapeutics; as well as the UND departments of Biology and Atmospheric Sciences mentored the undergraduate researchers.

Funding for the students came from a variety of organizations, including the National Institutes of Health and the National Science Foundation.

One of the goals of the summer research program is to provide students with the opportunity to work side-by-side with an established research scientist. An additional goal is to recruit students from rural and tribal colleges for future participation in UND undergraduate and graduate programs. The summer research program is designed ultimately to bolster the workforce pipeline of biomedical research scientists and health care professionals.

In addition to the University of North Dakota, this year's

participants were from Concordia College (Minn.); Hamilton College (N.Y.); Lycoming College (Pa.); Sitting Bull College (N.D.); Southwestern Baptist (Mo.); Turtle Mountain Community College (N.D.); University of Minnesota, Twin Cities and Morris Campuses; Wartburg College (Iowa); and Waynesburg University (Pa.).

MD Class of 2015 takes Hippocratic Oath

The UND School of Medicine and Health Sciences welcomed the incoming Class of 2015 with the traditional White Coat Ceremony on Friday, Aug. 5, at the Alerus Center in Grand Forks.

The students were given many wise pieces of advice by the speakers at the event. Guest speaker Darrell Kirch, president and CEO of the Association of American Medical Colleges, reminded students that there are four ethical principles that all doctors should live by: (1) do good, (2) do no harm, (3) respect the patient's decision, and (4) practice social justice. The last principle was a particular reference to the nation's health care law, which addresses an issue that Kirch said may not be a problem Congress can fix. "We (doctors) can work to put justice in the health care system," he told the students. "It's how we'll always be judged. It's what makes our white coats real."

Nick Neumann, interim associate dean of Student Affairs and Admissions, told students that the White Coat Ceremony is an auspicious event, foretelling great success. "You do belong here," he told the students, noting that 300 applications were received and 149 students were interviewed before the Class of 2015 was selected. "You can feel the hope and expectations in this room. This is the first act in a series of acts that is going to occupy your lives over the next seven to ten years or so. This process will definitely be hard work, but also enriching fun, as well."

Kim Krohn, president of the North Dakota Medical Association, pointed out that a white coat can symbolize a barrier—good and bad. It can serve as a barrier to infectious organisms (good), but sometimes it can be a barrier to communication with a patient (bad). She encouraged the students to stuff the pockets of their white coats with resources—reference cards, notecards, pens, and paper. The NDMA provides the white coats to each incoming SMHS class. Krohn's son Turner Fishpaw happens to be part of the Class of 2015. She is also the director of the Center for Family Medicine in Minot.

Dean Wynne concluded the event by reminding the students that society expects those wearing white coats to act as professionals. "Think about your responsibilities each time you put on the white coat," he said. "I hope you make a silent commitment to become the best physician you can be."

View the video at <http://bit.ly/mOxBWz>.



Darrell Kirch

Sen. Conrad receives rural health award



The National Rural Health Association presented Sen. Kent Conrad with the Lifetime Legislative Achievement Award on the UND campus Aug. 11. The award, presented by Brad Gibbens, deputy director of the Center for Rural Health, was given in recognition of Conrad's work to protect and improve access to rural health care in North Dakota and across the nation.

In accepting the award and reflecting on his experience with rural health, Conrad told the roughly 60 in attendance that when he first came into office, North Dakota was near the bottom in terms of Medicare reimbursement for the state's hospitals and physicians. The formulas for reimbursement were based on historical costs, which were very low in North Dakota. As the state became more efficient compared to others around the country, reimbursements were even lower. So with the Medicare Modernization Act passed in 2003, Conrad attached amendments to the act that gave approximately \$177 million in reimbursements over a number of years to North Dakota health care providers.

In the Affordable Care Act passed in 2010, Conrad and fellow legislators Sen. Byron Dorgan and Rep. Earl Pomeroy attached the Frontier Amendment, providing \$52 million per year to North Dakota hospitals and more than \$16 million per year to the state's doctors. North Dakota is now at the average level of Medicare reimbursements, according to Conrad. "Those (accomplishments) are things I'll always carry with me," he said. "It meant a lot to me to get those changes adopted into law."

He noted that some members of the U.S. House of Representatives want to eliminate the Frontier Amendment. "That cannot be permitted to happen," he said. "It would be a grievous injustice and a serious blow to the quality of medicine in North Dakota."

In response to concerns he was hearing about the difficulties in enticing doctors to practice in rural areas of North Dakota, he created the Conrad State 20 Program in 1994, a J-1 visa waiver program that allows doctors, nurses and other health care providers from abroad who are trained in the United States to stay and practice in underserved areas

of the country. The program later grew into the Conrad State 30 Program. Since 1994, the program has brought more than 10,000 doctors to serve in America, he said, including more than 100 in North Dakota. "It's really one of the things I'm most proud of," he said. "In later years, I had doctors—earnest and bright-eyed—come up to me and say, 'I'm here because of the Conrad State 30 Program.'" Recently Conrad secured an extension of the program through October 2012.

Conrad pointed out that the United States has the most advanced medicine in the world, but also the most expensive. In fact, \$1 of every \$6 in the U.S. economy goes to health care, he said, and in the not-to-distant future, it could be \$1 of every \$3. "That can't be permitted to happen," he said. "That won't work. We've got to change."

Conrad plans to re-introduce his Rural Hospital and Provider Equity Act (R-HoPE) legislation later this year, which would further improve Medicare reimbursement formulas for rural health care providers, extend expiring rural health provisions, and create a new loan program to assist rural hospitals in repairing and replacing aging buildings and infrastructure.

View the video at <http://bit.ly/nvARZB>.

Joggin' with Josh



Joshua Wynne, MD, MBA, MPH, University of North Dakota vice president for health affairs and dean of the School of Medicine and Health Sciences participated with the School's students, faculty, and staff to advocate healthful lifestyles by Joggin' with Josh, an informal 5K or 10K walk, jog or run on August 11 and September 8.

"The UND School of Medicine and Health Sciences wants to continue to practice what it preaches, which includes healthful lifestyles for better health," Wynne said. "I will be walking the 5K this year as I continue to recover from back surgery, but hope to be back jogging by next year."

See more pictures at <http://bit.ly/mYzMUB>.

Stemming^{the}Tide

UND's Women in Science group aims to patch the leaks in the STEM workforce pipeline.

By Juan Pedraza

Reality check: of the more than 840 Nobel Prize winners, including the sciences, from 1901 through 2010, only 41 have been women, including Marie Curie twice. That's about 5 percent of the total, even though women account for half the world's population and about half the workforce.

And check out the number of women among the 2,200 current members of the U.S. National Academy of Sciences: it's less than 10 percent of the total.

At the University of North Dakota School of Medicine and Health Sciences, the barriers have been falling, and women now account for roughly half the entering medical school class and have for several years. Women compose roughly one-fourth, or 11, of the 42 full-time tenured faculty at the School, although they make up 40 percent of the total faculty.

Maybe things are different across campus.

Not really, says Dr. Gretchen Mullendore, an atmospheric scientist in the UND Department of Atmospheric Sciences, at the John D. Odegard School of Aerospace Sciences.

"There are indeed more women in science, technology, engineering, and mathematics than there used to be," said Mullendore, who helped to launch the Women in Science group at UND earlier this year (the group includes several SMHS researchers). But, she cautioned, there still are many challenges, stereotypes, and questions that impede young women's choices regarding careers in those professions.

According to Mullendore, the faculty advisor for UND Women in Science, many barriers have fallen, and there's less hostility to women in the so-called STEM (science, technology, engineering, and math) professions.

"Yes, we've made great progress, but many barriers remain, and many of them are invisible," Mullendore said.

"I can say I've been fortunate, but I note that there are added difficulties for women in science," said Dr. Ann Flower who went to Colorado State University to be a

veterinarian and now is associate professor in the SMHS Department of Microbiology and Immunology. "I've seen out-and-out examples of discrimination—sadly, it does still exist."

"I also see that women are falling out along the way. You look at the percentage of women coming into graduate school. Through post-doc and at every level, women are dropping off," said Flower, who was contacted by Mullendore as the UND Women in Science group was getting off the ground and now sits on its faculty board. "Really, it's all about lingering discrimination."

As noted in literature published by the national Association for Women in Science (AWIS), an organization that UND's Women in Science group hopes to affiliate with in the near future, women in STEM professions—both in the academy and in industry—have had to overcome serious job discrimination, lower pay, and professional isolation. AWIS and similar groups across the country have spent decades fighting for equity and career advancement for women—"from the bench to the board room."

"We envision a day when women of all ages will participate fully in science, technology, engineering, and mathematics as manifested through equal opportunity, pay equity and recognition commensurate with their accomplishments," AWIS says in its mission statement.

AWIS reports that there's still a largely unfavorable climate for women in research settings, with most institutional policies inadequate to varying degrees in accommodating the needs of modern working families.

Contrary to the common belief that women "drop out" of the STEM workforce as a result of family commitments, lack of interest in the work, or inability to compete, the main reason women leave careers in STEM is the psychological impact of "stereotype threat," according to AWIS, in which a minority group feels inferior either implicitly or explicitly by virtue of being in the minority.





Ann Flower

Again, an item in a recent AWIS online newsletter: a report by McKinsey & Co.—the global business consulting firm—notes that only 11 chief executives of *Fortune* magazine’s listing of the top 500 companies are women. Marcia Reynolds of the *Huffington Post* pointedly explains, “Although the report includes a suggestion for leaders to work on the limiting mindsets that create the barriers for women, the recommendations focus primarily on ‘fixing the women’ instead of on fixing the system that created the problem.”

Unconscious gender bias or social stereotypes that lead to favoritism within a majority cohort (such as white men in the world of CEOs) have been rigorously demonstrated to disadvantage women in the workplace, particularly in STEM fields, according to the AWIS newsletter.

Mary Ann Mason et al. at the University of California–Berkeley wrote a report on “Keeping Women in the Science Pipeline”; they find that the majority of barriers to women in the STEM workplace have to do with systematic inequities such as lack of child care support, flexible tenure schedules, and other policies that disadvantage women.

Things apparently haven’t changed much since Marie Curie’s time early in the previous century.

“I have frequently been questioned, especially by women, of how I could reconcile family life with a scientific career. Well, it has not been easy,” said Marie Curie, who with her husband Pierre Curie and Antoine Henri Becquerel shared the 1903 Nobel Prize in Physics for the discovery of radioactivity—one half to Becquerel and one half to Marie and Pierre. She was the first woman to teach at the Sorbonne.

“The reason the Association for Women in Science exists is because science is still a boys’ club,” said Dr. Joan Herbers, AWIS president and professor of evolution, ecology, and organismal biology at The Ohio State University. “The emphasis has still shifted, but we are not over sexism. It is definitely not like when I went through school and early in my career,” Herbers said. “Sexual harassment has gone underground, but it is not a thing of the past yet.”

In “Why So Few? Women in Science, Technology, Engineering and Mathematics,” funded in part by the National Science Foundation, three American Association of University

Women researchers collected the findings of dozens of other studies to produce a report on challenges that girls and women face at every step of the way in studying and working in STEM fields. The report also catalogs programs and attitudes that have been found to be successful in attracting and keeping women in STEM.

In examining hundreds of studies, the AAUW researchers found eight major factors that helped depress the numbers of girls and women in STEM: beliefs about intelligence, stereotypes, self-assessment, spatial skills, the college student experience, university and college faculty, implicit bias, and workplace bias. Though women made up the majority of U.S. undergraduates in 2007, colleges and universities awarded 138,874 STEM bachelor's degrees to men and just 88,371 to women, the report notes, citing 2009 NSF statistics. More than half of STEM degrees awarded to women were in the biological sciences, where women make up the majority of students overall. (Women earned 48,001 bachelor's degrees in the field, while men earned 31,347 in 2007.) Totals were substantially smaller for women than for men in physics, engineering and computer science.

An 11-page report, "Women in STEM: A Gender Gap to Innovation," was the first analysis of women working in STEM fields by the U.S. Department of Commerce Economics and Statistics Administration (ESA). The study is based on data from the 2009 American Community Survey, an ongoing questionnaire by the U.S. Census Bureau that supplements the decennial census.

The report's overall conclusion that women are underrepresented in the U.S. STEM workforce—holding 24 percent of all STEM jobs while composing 48 percent of all workers—won't be a surprise to anyone who follows the issue. But they may find the lack of progress depressing: "Over the past decade, this underrepresentation has remained fairly constant, even as women's share of the college educated workforce has increased," explains a departmental press release on the report.

And, the report notes, even though

women in STEM professions outearned their sisters in other fields by about 30 percent—\$31.11 per hour—men in STEM jobs average \$36.34 per year.

For SMHS researcher Joyce Ohm, PhD, who started out wanting to be a physician, science for women is, indeed, challenging—but it's a challenge she's tackled successfully.

"I was lucky. While I have seen some overt discrimination along the way, no one ever told me I couldn't become a scientist," said Ohm. "I thought I wanted to be a physician, but I didn't know much about the opportunities in the research world until the end of my college years. Based on the questions I was asking, a professor I was working with told me that I was headed down the wrong road, and that what I really wanted to do was go into research."

"The biggest challenge I see (for women) is lack of role models in the hierarchy," Ohm said. "While I didn't see implicit barriers, I also didn't have very many women to emulate, and I can count on one hand the number of women that I know who have managed to juggle a successful science career and a family."

"At one university I worked at on the East Coast, it's still very much an 'old boys' network'—girls didn't fit in very well there," Ohm said. "Things are considerably better for women faculty members at UND."

"All this reminds you that to be a really successful scientist, science has to be your biggest priority," Ohm said. "We still work 80- to 100-hour weeks; when we're not at the bench, we're teaching, sitting on committees, writing grants, and reading papers. It's full immersion. Science can be very intense and very demanding."

"A lot of people recognize that it's very hard to do when you have a family," Ohm said. "If both mom and dad are scientists and working 90 hours a week, who is going to take care of the kids? It's usually the woman who drops out. Those societal norms still exist, and they still exist for very intelligent, very talented women."



We envision a day when women of all ages will participate fully in **science, technology, engineering, and mathematics**

as manifested through equal opportunity, pay equity, and recognition commensurate with their accomplishments.

Golden Opportunity

Undergraduates find summer research at the School of Medicine and Health Sciences to be an illuminating experience.

By Juan Pedraza



Anna Fossen in Dr. Doze's laboratory.

Erin Holdman worked this summer in Dr. John Shabb's laboratory.

What's remarkable about this otherwise everyday story is that Holdman, a transfer student from Northwest Community & Technical College, is an undergraduate. Her summer job involved participating in biomedical research as part of a team of scientists, post-docs, and grad students, doing work that traditionally has been thought of as strictly post-baccalaureate.

Shabb's lab is in the Department of Biochemistry and Molecular Biology at the University of North Dakota School of Medicine and Health Sciences (SMHS). Other faculty from the department, as well as the Departments of Anatomy and Cell Biology; Pathology; and Pharmacology, Physiology, and Therapeutics also welcome these undergraduates into their labs for the summer. For Shabb and other UND SMHS researchers who participate in these programs, research is at the heart of the everyday experience for students.

Holdman, a native of Kenora, Ontario, was one of several students who received support from

REFUNDU—Research Experiences for UND Undergraduates—one of several funding sources coordinated by North Dakota INBRE (IDeA [Institutional Development Award] Network of Biomedical Research Excellence) that provided biomedical research experiences for about two dozen undergraduates at UND this summer.

REFUNDU is funded by the SMHS Office of the Dean. The goal of the program is to enhance the ND INBRE initiative to attract talented basic and behavioral science undergraduates to professional careers in the health sciences. The program provides a 10-week summer research experience under the direction of Don Sens, PhD, in Pathology and Van Doze, PhD, in Pharmacology, Physiology, and Therapeutics. A number of faculty members, including Dr. Shabb, participate in the program, mentoring the undergraduates, integrating them into their lab teams. As Van Doze points out, "In addition to the hands-on lab experience, this program gives the undergraduates an opportunity to interact with others

who are committed to biological research, including post-docs and graduate students. We have found this to be important in ensuring a good lab experience. They form networks that can really support and help them in deciding on career directions."

The research themes this year included opportunities in the basic, behavioral, and translational sciences. Additionally, weekly faculty research talks introduce students to areas outside their own labs, and seminar programs cover topics such as career decision making, MD–PhD route, ethics, use of animals in research, and scientific writing for poster and manuscript preparation.

The REFUNDU program funded 13 positions for the summer of 2011 for rising sophomores, juniors, and seniors. Participants received a small salary based on a 10-week, 40-hour-per-week research experience. Interested participants completed an application process, including an autobiographical sketch, and had to submit it along with their college

transcripts and two letters of recommendation. The program ran from June 6 through August 12.

Encouraging undergraduates to participate in research is part of the long-term strategy of the North Dakota INBRE. INBRE aims to build biomedical research capacity by serving research universities, baccalaureate institutions, and tribal colleges within the state. Among the program's key goals is to initiate competitive, sustainable research programs at the predominantly undergraduate institutions in North Dakota: Cankdeska Cikana Community College, Dickinson State University, Mayville State University, Minot State University, Turtle Mountain Community College, and Valley City State University.

In its mission statement, the ND INBRE Office of Undergraduate Research says it's all about enriching the academic experience of all undergraduates in North Dakota by providing research and scholarly experiences in their chosen fields. This office promotes inquiry, discovery, and creativity in all disciplines through faculty–student mentoring relationships and the integration of instruction with research, scholarship, and creative activities.

Learning how to effectively marshal important resources in a researcher's professional life is integrated into the program. At the Harley E. French Library of the Health Sciences, a part of the School, reference librarian Dawn Hackman played a vital role in that mission.


"We like to tell students that if you haven't found anything after 15 minutes, it's time to call a librarian," said Hackman, who is a special resource for the students participating in REFUNDU and the other summer research programs. "I helped these students learn how to use our electronic databases" and tools such as RefWorks, which helps students organize citations and format their bibliographies. Likewise, the Medical Media staff provide a workshop, then a lot of patience, as they assist students in preparing their research posters for the

end of summer poster session.

REFUNDU is just one of several special programs that aim to open the magical doors for undergrads to the wider world of research. Running simultaneously in the summer, REFUNDU and these programs support approximately 40 undergraduates for a research experience:

- STEER—Short-Term Educational Experiences for Research is funded by the National Institute of Environmental Health Sciences, a part of the National Institutes of Health.
- REU—The University of North Dakota also hosts a summer Research Experience in Neuroscience for Undergraduates from Rural and Tribal Colleges, which is funded by the National Science Foundation.

ND INBRE's Office of Undergraduate Research emphasizes that it's not an "employment agency." The ND INBRE's primary goal is to provide undergraduate students with laboratory experience. While pay is available for some summer and academic-year positions, most are voluntary or for credit only. The research experience and training the students receive has been shown to directly benefit their education and helps prepare them for future success in their careers.

Many careers are opened up to undergraduates who take advantage of programs such as REFUNDU. In addition to preparing students for medical school or a career as a physician, students also pursue research careers in anatomy, biochemistry, bioinformatics, biomedical engineering, genomics, nutrition, pharmacology, and psychology. 

In addition to the hands-on lab experience,

this program gives the undergraduates an opportunity to interact with others who are committed to biological research, including post-docs and graduate students.

Women in the Sciences: Out with the Past, In with the New



By Denise M. Korniewicz,
PhD, RN, FAAN,
Dean, UND College of
Nursing

Often when reviewing the literature associated with women in the sciences, the majority of the articles have focused on the themes of gender bias, family matters, discrimination, or “gatekeeping” issues surrounding admission to the sciences or technology fields. In fact, most editorials nationally and internationally dwell on similar themes when discussing the ability to increase the opportunities for women in the sciences.

Perhaps it is time to look into the future and think about a world in which these traditional views have been removed and focus on new themes that promote women in the sciences. A few suggested new themes would include creativity, originality, quality of work, outcomes associated with the scientific discipline, and the ability to communicate within and outside of the discipline. These ideas are not new; rather, it is the “actions” associated with these principles that would change the face of each scientific discipline. For example, the characteristics new applicants into science would have to demonstrate are the ability to “think” outside the box, critically think, and, most importantly, be able to disseminate new knowledge through effective oral and written communication.

In order to transform institutional structures to adapt to these suggested nontraditional methods for new and current scientists, it means changes in roles, functions, policies, operations, and leadership. The creation of different work environments that promote flexibility, multidisciplinary cross-training, team education, and excellence are new ideas that need to be embraced by scientific leaders. A future model of science education incorporating these themes would remove the traditional issues (gender, family, inequality) associated with women in the sciences

and provide future scientific leaders who have competed based on clearly established outcomes thus eliminating the obstacles of the past.

Women in the health sciences, medicine, and nursing have demonstrated dynamic capabilities and have led the way in providing new leadership models that may be of use to other basic science disciplines. Perhaps one reason that the health sciences have evolved may be due to the increased number of women entering careers in medicine and men entering careers in nursing. These nontraditional applicants are becoming the leaders of the future and provide new ways of thinking to both professions. For example, 47 percent of medical school graduates have been women (American Medical Association, 2011) and 6.2 percent of the nurse workforce has been men (189,916 men; American Association of Colleges of Nursing, 2011), which reflects a steady increase in gender changes in a once female-dominated profession. Thus the issue of gender as a contributing factor for self-sufficiency in the health sciences has been decreased. More and more health science disciplines have transformed into institutions that embrace interprofessional education. However, what remains a challenge are the leaders in the traditional science and technology disciplines who remain wedded to traditional beliefs that perpetuate the “same old” thinking. As more and more of the national dollars for science education and research decrease, institutional leaders will have to provide evidence-based approaches that link the educational backgrounds of their graduates to the scientific needs of the nation. We should highlight the new attributes associated with outcomes-based research methods regardless of the traditional values and beliefs of the past.

Putting Research into Motion

Faculty and students walk the talk by investigating evidence-based treatments.

By Mark Romanick, PT, PhD, ATC, and David Relling, PT, PhD

ACL Research

In many sports, tears of the anterior cruciate ligament (ACL) of the knee continue to be problematic for athletes. With discrepancy in neuromuscular function a likely factor in injury predisposition, research is currently being directed at the prevention of this injury. Physical therapy students Casey Darling, Marissa Laddusaw, Elizabeth Kornkven, and Hayley Letvin are examining the muscle activity/foot position relationship as a possible means to identify those at risk for ACL injuries. Their research at UND investigates whether the position of the foot influences the muscles of the lower extremity and therefore increases or decreases knee injury risk, depending on the nature of the foot-ground interface. The students utilize advanced motion-analysis equipment to assess joint-specific movement and electrical activity of the muscles during activity. The Vicon Motion Analysis equipment, specialized cameras, and software allow the students to capture the movements of the human body at over 100 frames per second. Analysis at this level of detail provides the students with an opportunity to objectively assess differences between the various experimental conditions of the study. The research project utilizes a single-leg squat on a stable



Dr. David Relling conducts ACL research by using motion analysis equipment.

surface with five varying inclination angles. If foot position demonstrates a significant influence on joint biomechanics and muscle activity, then foot support through orthotic devices could be an answer to decreasing the risk of injury.

Muscle Research

Skeletal muscle loses strength and size with age (sarcopenia), playing a significant role in the increased frailty of humans as they age. The Ames dwarf mouse is known in research circles for its delayed aging and increased life span. Holly Brown-Borg, PhD, Chester Fritz Distinguished Professor in the Department of Pharmacology, Physiology, and Therapeutics, has provided mice, lab space, and supplies to allow physical therapy students Kristine Dahlheimer and David Farder to investigate the muscle architecture and muscle fiber types in dwarf and normal mice to determine whether the Ames dwarf mouse retains better muscle health as it ages compared to normal mice. These students are comparing muscle fiber number and fiber size as well as muscle fiber type composition between these mice across their life span. Certain muscle fiber types are better suited for strength while others are better for endurance. If the Ames dwarf mouse is found to retain size, number, and certain fiber types in its skeletal muscle, it would serve as a model for continued study of the nature of sarcopenia and its influence on frailty.



Kristine Dahlheimer and David Farder study the effects of aging on muscle strength and size in Dr. Holly Brown-Borg's laboratory.

A Call to Arms

The School and UND's infectious disease research group bolsters its expertise.

By Denis MacLeod



Jyotika Sharma

On August 1, another piece of the infectious disease research group came into place at the School of Medicine and Health Sciences when Assistant Professor Jyotika Sharma, PhD, joined the Department of Microbiology and Immunology. She possesses master's degrees in both botany and microbiology, and a PhD in Microbiology. From 2001 to 2006, Sharma was a postdoctoral fellow at the University of Texas Health Center–San Antonio. She comes to the SMHS from the Biology Department at the University of Texas–San Antonio, where she was a research assistant professor since 2006.

Sharma's research focuses on host immune responses to *Francisella tularensis*, the bacterium that causes tularemia and is on the Centers for Disease Control and Prevention's National Select Agent Registry. Tularemia is characterized by a high fever, acute septicemia, and toxemia, and spreads to humans through several routes, including insect bites and direct exposure to an infected animal.

More broadly, her work encompasses human innate immune responses to infectious agents, neuroinflammation, and cancers. Her research fits into the general focus of the infectious disease research group at the SMHS and UND, who study vector-borne diseases, illnesses caused by bacteria or viruses that hitchhike their way to humans by thumbing a ride with insects or other pests like rats.

Sharma's research will catalyze the work of the group, "allowing for increased collaboration and research from both sides of the host–pathogen intersection," said David Bradley, PhD, associate professor and chair of the department.

She joins the following elite group of internationally recognized researchers at the SMHS and UND studying host–pathogen interactions:


- David Bradley, PhD, (chair and associate professor) researches host responses and potential avian-derived therapeutics for West Nile virus and other

flaviviruses—for example, dengue virus. West Nile virus infection results in a potentially serious illness transmitted by mosquitoes. Seasonal epidemics of West Nile virus flare up in the summer, continue into the fall, and occur around the world, with the Dakotas seeing a particularly high incidence. Although many of the flavivirus cause diseases that are lethal or debilitating, most lack a vaccine or effective treatment. Collaborative work with Avianax, LLC, has resulted in a goose-derived therapeutic for West Nile virus infection that is close to clinical trials.

- Catherine Brissette, PhD, (assistant professor, Microbiology and Immunology) studies the pathogenesis of the bacterium *Borrelia burgdorferi*, the cause of Lyme disease. This disease is the most frequently reported tick-borne disease of humans in the United States. The incidence of this disease has been steadily on the rise since first described in the late 1970s, having moved into the Dakotas in the past couple of years.
- Ann Flower, PhD, (associate professor, Microbiology and Immunology) investigates molecular and genetic regulation in Gram negative bacteria such as *Escherichia coli*. In particular, her lab is interested in the ability of bacteria to respond rapidly and effectively to changing environmental conditions, including adaptation to a host. Understanding the molecular mechanisms underlying these responses may provide potential therapies to eliminate these bacteria and the associated infections.
- Matthew Nilles, PhD, (associate professor, Microbiology and Immunology) investigates the pathogenesis of and potential vaccine candidates to the plague bacillus *Yersinia pestis*, the cause of bubonic and pneumonic

plague. Bubonic plague is transmitted between rodents or to humans by the bite of infected fleas. Swollen, blackened lymph nodes (buboes) develop, followed by septicemia and hemorrhagic pneumonia and death. The pneumonic form can spread directly from human to human via respiratory droplets. Outbreaks are explosive in nature, often with high mortalities.

- Clint Schmidt, PhD, (adjunct assistant professor, Microbiology and Immunology) is the director of Operations at NovaDigm Therapeutics, Inc., leading research to develop a vaccine to *Candida albicans* and methicillin-resistant *Staphylococcus aureus* (MRSA). These studies are currently in level 1 clinical trials.
- Jefferson Vaughan, PhD, (professor, Biology) is the department's expert in medical entomology, exploring mosquito and tick-borne diseases such as Lyme disease, malaria, and West Nile virus.
- Min Wu, PhD (associate professor, Biochemistry and Molecular Biology), investigates the molecular mechanisms of *Pseudomonas aeruginosa* infection-induced lung inflammation and injury, with particular focus on how lung macrophages (a type of white blood cell) eradicate *P. aeruginosa* and the cell signaling that results in phagosome formation (a phagosome is an organelle within a macrophage). The long-term goal is to develop novel vaccines and therapeutics to prevent or treat the bacterial infection by further manipulating the regulation of phagocytosis and cytokine production (cytokines act as intercellular chemical messengers).

Bradley said, "The addition of Sharma strengthens the infectious disease group and will allow the School and UND to be more competitive for large, multidisciplinary grants." 

Penguin Revolution

UND's Scrubs Academy helps students take flight toward a career in health care.

By Kristine Henke



Second-year medical student Jerdan Ruff and Dean Joshua Wynne teach the anatomy of a pig heart to Scrubs Academy participants.

It might have been awhile since you've heard the classic seventies tune, "Stayin' Alive" by the Bee Gees, but you know how it goes. (And now you may have it stuck in your head for the rest of the day—my apologies). You may associate this song with a number of things: big hair, disco pants, or *Saturday Night Fever*. If you're in health care,

you might have learned somewhere along the way that this catchy tune is the pace you should keep while giving compressions for CPR. This rhythm is a part of the numerous health-care related facts learned by 38 students, from rural and urban North Dakota communities, who attended the R-COOL-Health Scrubs Academy.

The Rural Collaborative Opportunities for Occupational Learning in Health, or R-COOL-Health Scrubs Academy, was a four-day, three-night experience where students just finishing Grades 6, 7, or 8 were able to come to the University of North Dakota campus June 19–22, 2011. The Academy’s goal was to provide a platform for the students to learn about a variety of options for careers in health care in an engaging, interactive, and fun environment.

The Center for Rural Health (CRH) has made mini-grants available for community-based health career activities since 2005. These well-received and successful activities were further developed into the Scrubs Camp program, which was modeled after a similar program developed by the South Dakota State Office of Rural Health. The CRH has given 24 grants (2010–2011) to rural communities within the state for one-day Scrubs Camps, where communities had to collaborate with their local health care system, school, or job or economic development authority to put on a daylong event for students to learn about health careers from their local providers.

After seeing how successful the Scrubs camps in rural communities were, the CRH decided to take it a step further by bringing the Scrubs program to the UND campus. Starting with support from the University of North Dakota Summer Program Events Council, the CRH pulled together resources from all over the campus, Grand Forks, and surrounding communities.

The need for a health care workforce in North Dakota was definitely the impetus in starting the Scrubs program. According to the School of Medicine and Health Sciences Advisory Council’s *First Biennial Report* and based on conservative estimates, North Dakota will need an additional 210 physicians at a minimum within the next 15 years. However, this shortage doesn’t stop with physicians. Allied health providers from nurses to physician assistants to

medical laboratory specialists will be needed to ensure that effective, efficient, and appropriate health care is available to all North Dakotans.

“In addition to being fun and energizing for all involved, we witnessed the enthusiasm, interest, and curiosity the students shared about traditional health careers as well as other careers they weren’t as aware of,” said Lynette Dickson, program director for the North Dakota State Office of Rural Health. “A firsthand testament that the time and funds expended for an on-campus experience such as this was worthwhile for the students, as well as the UND and other professionals who volunteered to teach about the vast opportunities in health care. This was yet another activity in our effort to ‘grow our own’ health care workforce.”

While at the Academy, students were exposed to as many health care professions and professionals as time permitted. The following topics were highlighted:

- Brain In-A-Box by Brianna Goldenstein and Katie Collette, UND SMHS
- Medical Laboratory Science by Peter Knopick, UND Medical Laboratory Science Department
- CPR by Terry Wynne
- Dentistry by Scott Amundson and Roger M. Amundson, DDS, FAGD
- Ears In-A-Box (Audiology, Physician Assistant) by Jeanie McHugo, program director, UND Physician Assistant Program
- Emergency Medical Services by Caleb Behm, EMT, Larimore Ambulance Service
- Eyes In-A-Box (Optometry) by Valley Vision Clinic
- Guts In-A-Box (Nutrition) by Karina Wittmann, UND Wellness Center
- Mental Health by Myron Veenstra, UND Counseling Center
- Nursing by Jodi Olson, Southwest District Health Unit
- Occupational Therapy by Anne Haskins, UND Occupational Therapy Department

This was yet
another activity
in our effort to

‘Grow our own’
health care workforce.



Terry Wynne (center) teaches CPR to Scrubs Academy students.

- Pig Heart Dissection by Dean Joshua Wynne, UND SMHS
- Pharmacy by Jana Hanson, Altru Family Medicine Residency Pharmacy
- Physical Therapy by Mark Romanick, UND Physical Therapy Department
- Public Health by Mandy Burbank, Grand Forks Public Health
- Radiology by Deb King, Northland Community and Technical College
- UND Human Simulation Lab by Cheryl Stauffenecker, UND College of Nursing

For the Human Simulation Lab session, students trekked to the UND Human Simulation Lab to visit Data, a simulator with some respiratory problems, and Noelle, a simulator of an expectant mother. One student in each group had the responsibility of helping Noelle with her birthing experience, and everyone got to practice their new CPR skills on Data to help him feel

better when he was having some extreme problems in breathing. During the pig heart dissection session led by Dean Joshua Wynne and some medical students, the Academy campers were paired up and performed dissections of pig hearts to learn about the anatomy and physiology of the organ, and some basics in dissection. This was definitely a favorite for the students.

In the Occupational Therapy (OT) session, students got the chance to become the patient and participate in different situations occupational therapists experience with their patients. You can imagine how funny it is to challenge a junior high student to spit out apple sauce while another student tries to feed them. Along with sampling food (in an educational manner), students tried on some assistive tools and went through an obstacle course OTs use with children.

Myron Veenstra, director of the UND Counseling Center, led students through a “tour of the mind” by having them work in teams to make decisions and solve problems. Through this, Veenstra helped the students realize who was comfortable leading and following. Using this knowledge, the students had to help themselves and each other figure out other tests commonly introduced in the psychology field.

These are a few of the many sessions students got to experience during the Academy. Student evaluations about the Academy indicated 100 percent of students who participated planned to attend college, and 89 percent are considering a career in health care. Students also indicated that the Academy helped them to understand their health care career options better and that they are currently enrolled or have plans to enroll in their school’s health or medical occupations class.

The second R-COOL-Health Scrubs Academy will be next June on the UND campus. If you have a student who will be finishing Grade 6, 7, or 8 who would like to learn more about how they can be a part of the “penguin revolution,” please visit ruralhealth.und.edu/topics/workforce/scrubsacademy/

Setting Research Roots

Dr. Jacque Gray cultivates the growth of American Indian researchers.

By Kristine Henke



Jacque Gray, PhD, an assistant professor at the University of North Dakota's Center for Rural Health, is the leader of the Native Health Research Team. This eclectic group of students, ranging from undergraduate to doctoral level, have come together to form the NHRT in order to meet a need that has been prevalent in Indian Country for far too long.

Gray is a Choctaw and Cherokee descendant, and has worked with tribes throughout Indian Country over the past thirty years. She has research experience with American Indians in the areas of health, depression, anxiety, veterans' health services, spirituality, suicide, career counseling, and nutrition.

To Gray, the importance of having a Native Health Research Team is as simple as "growing our own." The

Team is about building a support network to help American Indian students in many ways, and teaching these students how to be researchers. For undergraduate students, it might be about finding a niche at the University to help them along in their studies, or it might be about learning how to do graduate-level research. For post-graduate students, the Team can provide resources to help with research, scholarships, funding, and networking, which can be invaluable.

"Teaching Native students to work with Native populations in health care is important because most of the research in the past has been done by non-Native researchers who may have exploited the communities or not understood the data they collected

Native Health Research Team
Front row, left to right: WanmdiWi Rose; Paula Carter; Jacque Gray; Sarita Eastman
Back row: Colleen Kagan; Melissa Wheeler; Kyle Hill; Michael Mudgett; Jason Champagne; Julii Green

within the cultural context,” Gray said. The work of the Native Health Research Team has gained national recognition.

- For the American Psychological Association’s annual conference in Washington, D.C., this year, Gray’s students submitted nine research posters. All nine were selected. In addition, Melissa Wheeler, an undergraduate student at UND, received an award for the Outstanding Poster for Psychologists in Indian Country at the Psychologists in Public Service meeting.
- Three NHRT students were invited to attend the Center for American Indian Health 2011 Winter Institute at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland.
- Eight members of the Team attended the Northwest Portland Area Indian Health Board Summer Institute held in conjunction with Oregon Health Sciences University. Along with Gray, attendees from the National Resource Center on Native American Aging at UND included Paula Carter, PhD, (Turtle Mountain Band of Chippewa), Patty Lambert (Spirit Lake Dacotah), and Jacob Davis (Turtle Mountain Band of Chippewa). Attendees from the undergraduate research program were Jason Champagne (Red Lake Band of Chippewa), Melissa Wheeler (Diné), Sarita Eastman (Sisseton-Wahpeton Oyate), and Sierra Davis (Mandan, Hidatsa, Arikara Nation).

“I understand research much better because of being with the Team,” said Michael Mudgett, an undergraduate student. “I can look at things and add my own suggestions. Now, we don’t need as much help ‘holding our hand’ as we did when we first started [with the Team].”

Students are learning to become researchers, but they are also getting life experience by being on the Native Health Research Team. “We talk about

careers, and ask students what they want to be doing in the future to help them make decisions about their education,” Gray said. She spends time learning about the students’ interests and where they might fit in. If students are interested in research, having the experience and networking opportunities Gray can offer can be invaluable. For one student, the contacts he was able to make through Gray helped him to gain a prestigious spot in the School of Public Health at the University of Minnesota, with scholarships to cover most of his schooling and living expenses.

Gray teaches more than just the analytical side of research. “If you’re working with me, you need to know what you have to do, and how it has to be done,” she said. “It’s important the students are not exploiting tribes with the research they are doing and that they get to know the tribes before they ask to do research. I have had students volunteer in a number of ways on reservations.” These include working in classes on domestic violence, parenting, and behavioral health, as well as learning some tribal heritage if the students aren’t familiar with the tribe. The relationships the students build are as important as the data they hope to collect. Many students do research with their own reservations. The hope is that they will do research on the health needs of the people in their home communities and return to apply that research when they finish school. The greatest health concerns in Indian Country are diabetes, heart disease, cancer, youth suicide, depression, and anxiety. American Indians serve in the armed forces at the highest rate of any ethnic group, but are served at the lowest rate by the Veterans Health Administration hospitals and clinics. Part of what the Team does is to look into why this is so and how the barriers they find can be reduced.

The Team works in partnership with the community to address critical health issues. It is important the community have a part in the interpretation of the data; they receive and approve the publications that come

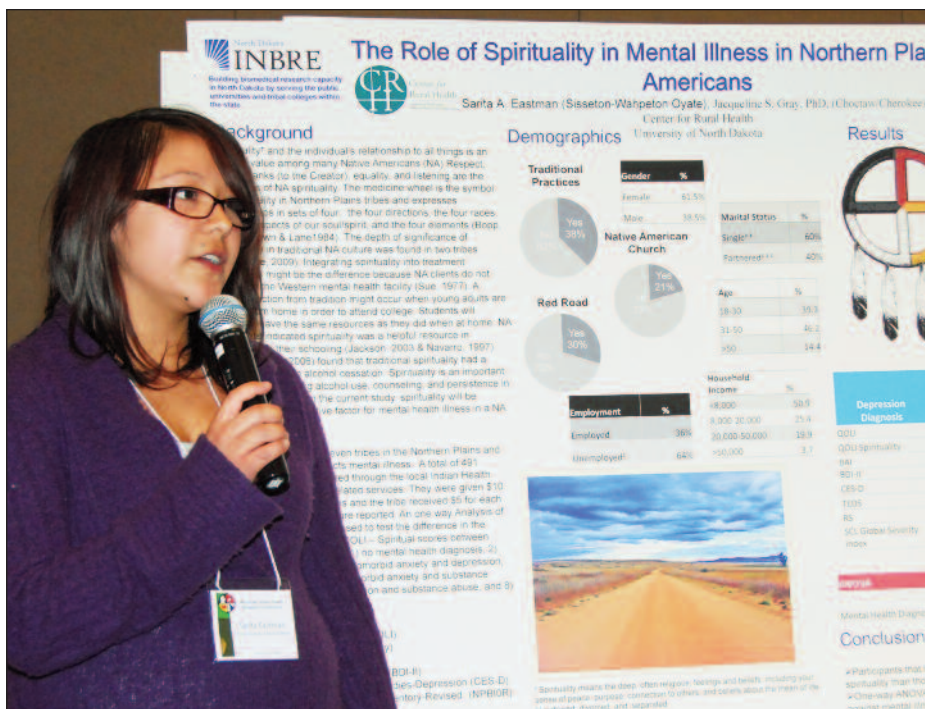
about from that research, and the community understands how they will benefit from the research. Conducting ethical research is a very important part of what students learn on the NHRT. Members of the NHRT learn that their responsibility is to the tribe first not the research.

Much like the relationships the students build with the communities they hope to help, Gray and her students have built strong ties with each other. So much so that their group is like a home away from home.

“Sometimes, I feel like I’m raising twenty-five children,” Gray states, “It’s more than just talking with the students a few hours each week. It becomes like a family.”

Starting with just one graduate student four years ago, the Native Health Research Team has grown and flourished, graduating Native students at the undergraduate, graduate, and doctorate levels. Initial support for the Native Health Research Team came from the Garrett Lee Smith Campus Suicide Prevention Grant and the Native American Research Centers for Health Mood Disorder Assessment Validation Study supported by the National Institute on Drug Abuse. In addition, Donald Sens, PhD, professor in the Department of Pathology, working through the North Dakota IDEa Network on Biomedical Research Excellence has helped to support the students and their research through the UND Indians Into Medicine program and Research Experiences for UND Undergraduates, which is funded through the National Center on Research Resources at the National Institutes of Health. Students also have Marilyn Klug, PhD, associate professor at the Center for Rural Health, assisting as a biostatistician for the group, and Sandi Bates, MLIS, head of reference and user education with the Harley E. French Library of the Health Sciences, providing support in finding and using literature for research.

“[When I was going to school] I didn’t have anyone to help me, so I can get them a start so they can do better



and are offered more opportunities,” Gray said. “I learned more about my Native heritage as an adult, so I’m not as well versed, but I can be a person with a foot in each world. I want the students to survive the academic world to return to their own world to make things better.”

What is the one thing that Gray would want to share with others about her Team? “We grow Native researchers who know how to do ethical research in Native communities.”

Sarita Eastman, a member of the Native Health Research Team, presents her findings at the American Indian Health Research Conference.



Convergence

Faculty mentors connect students to research.

By Juan Pedraza



Bethany Davis

A career in science wasn't the first thing on the horizon for Bethany Davis, an enrolled member of the Turtle Mountain Band of Chippewa who grew up in Belcourt, N.D.

"When I first started looking at career choices, I had no idea what I wanted to do, but I knew that I wanted to give back to the reservation," said Davis, a senior at the University of North Dakota majoring in biology and pre-med studies.

"Then I thought about becoming a physician, and that's why I went into biology," Davis said.

But it wasn't until her sophomore year at UND that Davis discovered the joys of research.

"I heard from a friend about Dr. Van Doze in the School of Medicine and Health Sciences and that he offered undergraduates research experience," said Davis, whose mother is a special education teacher on her home reservation. "I still work with him—this is my third summer working in his lab. It's a terrific experience."

In Doze's lab, Davis is working on her own project.

"I'm doing research in Alzheimer's disease, working with this overexpressed receptor in the brain," said Davis, whose father is a farmer. "We're going through the trials, seeing exactly what's going on. I didn't pick the project, but Dr. Doze talked to me about it, and I found it interesting and wanted to be part of it."

This is a big leap for a young student with little background in science before coming to UND.

"I just wasn't exposed to this kind of experience in high school," Davis said. "And I saw none of that when I was a hospital volunteer—I didn't see any of this kind of stuff. I had to move out to get this kind of exposure to science."

Davis has taken advantage of the INMED (Indians Into Medicine) program.

"They've been really good at helping me, talking about goals," she said. "Then there's the American Indian Student Services—I meet regularly with their academic advisors; they help me to stay on track."

"I really like what I'm doing, and I want to see this through," she said. "I was interested in neurodegenerative disease. I don't have any of that in my family, but there are lots of people back home who are in the early stages of dementia. So that's how I picked the project I'm working on in Dr. Doze's lab. I plan to do an Honors thesis on the project."

For Davis, having a child at home keeps things real.

"My daughter is always with me when I'm not in school," Davis said. "She keeps things interesting. She also helps me to decompress—we go bike riding, and we love to go fishing."

Erin Holdman

Unusual just about defines Erin Holdman's route to the University of North Dakota. Science and research weren't real big in her idea cache at the time.

From the International Bible College, a small private school in Moose Jaw, Saskatchewan, Holdman, a Kenora, Ontario, native, found her way to Northland Community & Technical College in East Grand Forks, Minnesota.

On that journey, Holdman met her husband Scott, a Grand Forks native who met Holdman when she was attending the Bible college in Moose Jaw. It helps to understand that Holdman's father started his own church in Kenora and helped to take care of folks who had no place to go.

"We were actively involved in helping those less fortunate, with addictions and family issues, and my parents also had foster children," Holdman said. "That experience was foundational to who I am."

Along the way, she did an internship at the Northlands Rescue Mission in Grand Forks, where her husband also was completing a similar stay. Scott and his dad run a fundraising consulting company for nonprofits.

"It took a lot of effort to decide to go back to school, and at the time that I made that decision, I didn't realize that it took a lot of energy out of me," she said. "I was content to pursue a two-year program in cardiovascular technology because I wanted to help people. I really wasn't confident enough to pursue anything more than that."

But a few inspiring conversations with her husband and professors at Northland convinced her that what she really was capable of achieving was her dream—medicine.

"So I switched to a pre-med emphasis and transferred to UND," she said. "I'm getting a degree in medical lab science; it's a four-year degree, and for me, it's something more tangible, more hands-on, directly related to the medical profession."

Holdman worked this summer in Dr. John Shabb's laboratory in the

Department of Biochemistry and Molecular Biology at the UND School of Medicine and Health Sciences, where research is at the heart of the everyday experience for students. Holdman received support from REFUNDU (Research Experiences for UND Undergraduates), one of several funding sources coordinated by North Dakota INBRE (IDeA [Institutional Development Award] Network of Biomedical Research Excellence) that provided biomedical research experiences for over two dozen undergraduates at UND this summer.

"I'm in a lab with all guys, which isn't typical for this program," Holdman said. "I connected with this opportunity through the Grand Forks Master Chorale. Dr. Shabb and I sit on the board, and the chorale director Dr. Josh Bronfman knew that Dr. Shabb had an undergrad research opportunity."

"This summer I'm working on a project where we're basically trying to characterize the structure and function of a certain protein found in melanoma that leads to cell invasion when it is activated. We want to understand how it operates, how it gets activated, and how to shut off or prevent that activation."

"It is absolutely incredible to have the opportunity for this experience," Holdman said. "I'm actually physically doing something that's going to change medical science. This has been really helpful in terms of how I see my future. For sure, I would like to continue doing research. It takes an insane amount of patience, but it's so rewarding when you get to discover why something goes wrong."



Erin Holdman

Evolving with Medicine

Dr. Chris Pierce, '95, has brought a new heart ablation procedure to North Dakota.

By Jessica Sobolik



Mie and Chris Pierce and family

When Chris Pierce, a cardiologist and electrophysiologist at Sanford Health in Fargo, first read about a new freezing procedure being used to correct irregular heart rhythms. He was intrigued. Already being used in Europe, the procedure was just approved in the United States this year, and it sounded promising.

“Medicine is a constantly evolving field,” Pierce acknowledges. “There have been a lot of advances (in cardiology) since I started doing it. That’s the way it goes; things evolve and you need to keep up.”

As an electrophysiologist, Pierce fixes electrical problems of the heart—for example, slow heartbeats, fast heartbeats, rhythms that cause people to pass out. He had been correcting irregular heart rhythms with a procedure that essentially burned irregular heart tissue, but there were risks and the procedure took six hours—a physical and emotional toll on the patient and himself. By using the new freezing procedure, Pierce could cut the procedure time in half. He convinced Sanford to invest in the expensive equipment.

Start of a Journey

It’s no surprise that Pierce keeps up on the latest medical technologies through reading. When he was a kid, his mom, who went to nursing school, bought him an anatomy and physiology book to read. “She really planted the seed,” he said. “She always thought medicine was a noble profession.”

He attended medical school at the UND School of Medicine and Health

Sciences, earning his degree in 1995. He remembers the heavy emphasis back then on lectures in the first two years, and more so enjoyed the clinical experiences that followed. He completed his Internal Medicine residency in Fargo.

He was inspired to pursue electrophysiology while completing a cardiology fellowship at Good Samaritan Regional Medical Center (now Banner Good Samaritan Medical Center) in Phoenix. "Almost [all of the fellows] did interventional cardiology, which focuses on inserting stents," he said. "I had a fellowship director, Dr. Kenneth Desser. He was incredible at reading electrocardiograms. He could read each rhythm in a second, or he'd read them upside down even though we'd given him 100 EKGs. He had a great teaching style. I was very fortunate in that they had a lot of really good electrophysiologists in Phoenix, but no other fellows wanted to do it. So I got to do everything, and it was great exposure."

He completed an electrophysiology fellowship at the University of Minnesota Medical Center–Fairview in Minneapolis and began conducting heart ablation procedures for Sanford. Pierce along with Dr. Manuel Otero performed the first heart ablation procedure in North Dakota. There is only one other electrophysiologist in the state. In July, Pierce became the first doctor in the state to perform heart ablation surgery using freezing instead of burning.

Bringing New Technology to North Dakota

Heart ablation surgery is for patients whose hearts beat too fast. Pierce's past heart ablation surgeries, using the burning method, involved inserting a catheter into arteries and veins in the legs, pushing the catheter up to the heart, determining where the bad signals were coming from and burning those irregular tissues. He had to closely monitor the temperature during the procedure because the esophagus is located right next to the heart and could be damaged. To prevent such


damage, Pierce also ran a temperature gauge about the diameter of a spaghetti noodle into the esophagus for monitoring during the procedure.

After Pierce read about the freezing procedure and Sanford agreed to buy the equipment for it, Pierce went to Minneapolis to attend training conducted by the equipment provider. Many of the doctors conducting the training had been involved in the trials that were necessary to achieve approval for use in the United States. "That's the nice thing about other countries doing these procedures first," Pierce said. "The U.S. approval process takes longer. We have the advantage of seeing what's going on overseas and the results of studies before we start doing it here."

Training was conducted using various simulation methods. Then a representative of the equipment provider visited Sanford, where he trained the personnel that would assist Pierce with the procedure.

Within a month after his first procedure, he conducted the surgery four more times, using a combination of the burning and freezing methods. Especially after the Fargo *Forum* wrote an article featuring the new procedure, he has been busy. "The number of people I'm seeing who are candidates for this procedure is increasing," Pierce said. "I got a ton of phone calls after that article, and I'm receiving referrals from doctors I didn't know before."

In fact, Pierce had to postpone a planned vacation with his wife Mie (pronounced Mia) and three kids one week so he could see all his new patients in a timely manner. "There are a lot of people with that type of heart rhythm problem," he said. "As time goes by, I might not be the only one in the state to do it."

Using the new freezing technology, Pierce aims to cut the procedure time to three hours instead of six hours. "Then I could treat two patients in one day," he said. The six-hour procedure, taking no breaks while wearing a lead suit, can be grueling, he admitted. 

'10s

Prabin Lamichhane, FM Res '11, has joined the family medicine department at Essentia Health St. Mary's Clinic Detroit Lakes, Minn. Dr. Lamichhane focuses on adolescent, adult medicine, and pediatric care.



Stephanie Traxinger, FM Res '11, recently joined the family medicine department at Mid Dakota Clinic in Bismarck. Traxinger is a member of the American Academy of Family Physicians and the Alpha Omega Alpha Honor Medical Society.



Brent Buchholz, PA '10, is the newest member of the Sanford Health Clinic in Oakes. He specializes in family medicine and, in addition to the Oakes clinic, currently practices at the Sanford clinics in Forman, Lisbon, Lidgerwood, and Gwinner with a possibility of also traveling to LaMoure and Ellendale when needed.

'00s



Vijay Chaudhary, IM Res '08, recently joined the Medcenter One Cancer Care Center. As a hematologist/oncologist, Chaudhary provides care for patients diagnosed with blood disorders and cancer. Treatment services include chemotherapy, preventive services such as cancer screenings, and research/clinical trials.



Katherine Knoll, MD '08, joined Medcenter One Q&R Clinic in Bismarck. Knoll provides care for newborn to adolescent-aged children. Originally from Bismarck, Knoll completed her internship and pediatric residency at The Children's Mercy Hospital and Clinics in Kansas City, Mo.

'00s



Justin Reisenauer, MD '08, and **Matthew Zimny, MD '08**, recently joined Medcenter One in Bismarck as part of the Emergency and Trauma Center. Reisenauer and Zimny will work to stabilize all injuries, illnesses, or trauma cases that enter the Trauma Center, a Level II Emergency and Trauma Center.

Derek Brickner, MD '08, recently joined Medcenter One in Jamestown as a family medicine doctor.

Jed Perkerewicz, MD '07, recently joined the Ob/Gyn department at Sanford Health Detroit Lakes (Minn.) Clinic.



United States Army Captain Jon Solberg, MD '06, has successfully fulfilled the certification requirements of the American Board of Emergency Medicine and is now a diplomate of the board. He is a U.S. Army emergency medicine physician currently deployed to Afghanistan with the 115th Combat Support Hospital.



John Miller, MD '06, recently joined Medcenter One in Bismarck. As a radiologist, Miller interprets ultrasounds, mammograms, CT scans, MRIs, nuclear medicine studies, and X-rays to diagnose and treat injuries and diseases

Chad Carlson, MD '05, has joined the orthopaedic team at the Bone and Joint Center in Bismarck, N.D.

'00s



Jessica Ruhland, MD '05, joined Mid Dakota Clinic in Bismarck. Ruhland is board certified in general radiology with expertise in CT, MRI, X-ray, and ultrasound. She specializes in imaging techniques that are a crucial component in breast cancer screening and diagnosis, including mammograms, breast ultrasound, ultrasound-guided biopsies, and stereotactic breast imaging.



Ronald Reilkoff, MD '05, joined the faculty at the University of Minnesota as a member of the Medical Intensive Care service at Fairview Southdale Hospital. His clinical interests include pulmonary fibrosis, critical care, and bedside ultrasound.

'90s



Melody Hof, PA '97, recently retired from the United States Air Force with the rank of lieutenant colonel. She continues to practice as a dermatology physician assistant at Southern Illinois Dermatology with 11 offices located throughout southern Illinois.

'80s

Mary Aaland, MD '82, has joined Sanford Clinic in Fargo. She specializes in surgery, critical care, and trauma.

'70s

Terrance Mack, BS Med '70, recently retired from West River Health Services in Hettinger after 38 years of practice. Mack dedicated his career to family practice and plans to enjoy his retirement by spending more time with his family and traveling.

'60s

Ann Haller, MS Anatomy '69, recently retired from teaching anatomy, biology, and physiology at Kellogg High School in Kellogg, Idaho. Haller had taught for 31 years. In 2003, she received the Outstanding Biology Teacher in Idaho award.



Bruce Becker, BS Med '67, received the John K. Williams, Jr. Adaptive Aquatics Award for 2011 from the International Swimming Hall of Fame at induction ceremonies on May 7 in Fort Lauderdale, Fla. Becker is a physician specializing in physical medicine and rehabilitation. He is director of the National Aquatics & Sports Medicine Institute at Washington State University, where

he has been studying the biologic changes found during water immersion at differing temperatures.

'50s

Jim Leigh, BS Med '50, recently retired after 58 years of practicing medicine. He began practicing in 1954 with his father. The two opened a Grand Forks clinic in their name in 1962. Leigh was an athletic doctor for UND hockey teams for 30 years.

Got news?

We want to hear it!

Please send your news items for the next issue of *North Dakota Medicine* to Kristen Peterson:

kristen.peterson@med.und.edu
or call 701.777.4305.

Installment Plan

The National Health Service Corps helps both students and communities in need.

By Aaron Ortiz



Martha Williams

Established in 1972, the National Health Service Corps (NHSC) was developed to respond to the growing need to recruit primary care providers into rural and underserved communities. The Corps currently funds primary care physicians, dentists, psychiatrists, nurse practitioners, physician assistants, and others to work in rural or underserved settings. There are two types of corps providers. The first are the loan repayors; the second are NHSC Scholars. Each group will eventually practice in a Health Professional Shortage Area, which is a federal designation that an area needs primary medical care, dental, and mental health providers.

Scholars commit to serve in a rural or underserved area while in school, and in return, they have their medical or professional education paid for as they progress. Loan repayors commit to serve after they finish their training. The current amount of educational debt payback they can receive through the program is up to \$170,000.

Martha Williams, a physician assistant, recently began a two-year NHSC Scholar obligation in Rolla, N.D., at Northland Community Health Center, a facility that provides access to

quality health care for anyone regardless of ability to pay. Rolla (population 1,428) is an agricultural community in north central North Dakota about 23 miles from the Canadian border.

We recently had a chance to visit with Williams about the NHSC program and her new practice setting.

Rolla is a long way from your home in West Virginia. How did you come to the decision to choose this location to practice?

I'm a National Health Service Corps Scholar, so the federal government paid my way through PA school. In return, I agreed to practice for two years in a rural or underserved area. I started looking at clinics on the NHSC website and began conversations with recruiting facilities. At the NHSC Scholar conference that is held each year for scholars to meet facilities, I met three employees from the Northland Community Health Center and a Center for Rural Health staffer.

After the conference, I had countless conversations and e-mails with the facility and eventually went on the interview in October 2010. After I interviewed in Rolla, I interviewed at other facilities on the East Coast. The things that made North Dakota stand out were that everyone was very thoughtful and helpful, each individual was pleasant to speak to, and it was a great recruitment experience. Also, when I spoke with the Chief Medical Officer Dr. Cid, she informed me how a provider would work within the clinic. What she told me was what I was hoping my first job would be like. I didn't want to be practicing completely alone, but I also didn't want someone looking over my shoulder every step of the way. The environment in Rolla fit the practice style I was looking for.

Would you recommend the NHSC program to other providers?

For sure I would recommend either the scholarship program or the loan repayment program. I've known other people that are in the loan repayment program, and they've had great experiences. Students practice where they are truly needed, and it helps take away the worry of that financial burden students face.

What was the cost of your PA training program?

When you do tuition, fees, lab stuff, and transportation to clinic sites, it all comes out to \$40,000 per year. I remember looking at the bill thinking, "Oh my gosh, I have a \$120,000 debt load." I was thankful I was a National Health Service Corps Scholar, and I didn't have to think too much about it.

What did it feel like when you completed your first patient visit on your own?

When I went to sign off on my chart, I was thinking, "Wow, I'm really doing this." It was a sense of accomplishment. I had spent the last three years of my life trying to reach this moment, and I was so happy to finally be practicing! I have the support of Dr. Cid, whom I know I can always ask questions, but it's really great to finally be able to see patients on my own and start thinking on my feet as a practitioner.

Has anything been challenging for you to this point?

I think the biggest thing has been trying to forge new relationships in my community. That can be an issue regardless of where you are, but when you're in grad school or college, you just form new relationships with people who are in the same boat. The biggest struggle for me has been to find someone my age. It's not that I don't want to hang out with those people that are older; I just would like to find someone my own age to relate to.

What would you say the current role of a physician assistant is? How do you believe it could change in the next ten years?

My dad and mother were expecting a new baby, and they had a PA come in and do a routine OB exam. My dad said, "I don't want a PA; I want a doctor." It was a great example of someone not knowing enough about the profession to really make that statement. Once he realized what a PA was and the care they can provide, he was more open and welcoming to the idea. That kind of mentality still exists, but as a PA, I view it as my role to inform the public as to what we are, the level of care we provide, and our scope of practice.

As physicians continue to subspecialize, the primary care shortage continues to grow. With health care reform we're going to see an even larger need for primary care as more individuals will have the coverage to access these services. So the demand for primary care is going to increase again, and I see my role and the role of my profession as continuing the long history of providing high-quality, full-scope primary care.

As you begin this new chapter, what are you most excited about? What makes you nervous?

I am so excited to be making my own decisions. There was a time in PA school that I would have plans for my patients, and the provider overseeing me wouldn't like my care plan, and I would alter the plan. Now I have the freedom to make my own decisions and develop individual care plans for patients. That is both scary and exciting. If you can show me a provider who is not at least a little bit nervous about the care they are delivering to a patient, I don't think they're truly developing those connections and relationships with their patients.

Martha continues to live and practice in Rolla, N.D., is engaged with the North Dakota Young Professionals Network, and the last time we spoke, she was still as excited as ever to be seeing patients in her community.

When I went to sign off on my chart, I was thinking,

**“Wow,
I’m really doing this.”**

It was a sense of accomplishment.

Charting “the Undiscovered Country”

UND forensic pathologists translate tragedy into treatments.

By Denis MacLeod



Shown in UND's new forensic clinical practice facility are, left to right, Dr. Mark Koponen, Senior Associate Dean Gwen W. Halaas, Chester Fritz Distinguished Professor Mary Ann Sens, and Forensic Investigator Ed Bina.

Murder, mystery, and mayhem rule the landscape of television, where talk shows and crime-scene-investigation dramas use autopsy reports from forensic pathologists as bills of fare to whet our appetites for not only who “dunnit” but also how they did it.

Forensic pathology is a necessary part of our legal system, but how many of us associate forensic pathology with family and public health? The

Department of Pathology at the UND SMHS recently added a powerful, extensive new tool that equips UND forensic pathologists with the means to prepare and present evidence to prosecute the guilty as well as exonerate the innocent, and do much, much more. That new tool is the School's forensic clinical practice facility, which opened on July 6.

Former U.S. Sen. Byron Dorgan was instrumental in securing a grant for the project through the Health Resources and Services Administration, and Grand Forks County was vital to securing a Paul Coverdell Grant to computerize the facility.

“The new building opens up the possibility to provide more services to the state and the region,” said Mary Ann Sens, MD, PhD, Chester Fritz Distinguished Professor and chair of the Department of Pathology at the UND SMHS.

Sens is the coroner for Grand Forks County and currently president of the National Association of Medical Examiners (NAME). NAME is the national professional organization of physician medical examiners, medical death investigators, and death investigation system administrators who perform the official duties of the medicolegal investigation of deaths of public interest in the United States.

Recently joining Sens in the Department of Pathology are fellow forensic pathologist Mark Koponen, MD '86, a forensic pathologist and Minot, N.D., native, and Ed Bina, a forensic investigator, who will conduct death investigations under the supervision of Sens.

In addition to handling criminal cases for Grand Forks County, the UND facility covers all of North Dakota when the state's chief medical examiner is not available. Sanford Health System in Fargo and Altru Health System in Grand Forks have contracts with the facility to do all of their autopsy cases. Sens and UND already have contracts with five Minnesota counties—Kittson, Mahanomen, Marshall, Red Lake, and Norman—that report all deaths within their borders to UND, and the Pathology Department has primary jurisdiction to decide which deaths to investigate. In addition to those five counties, several other Minnesota and South Dakota counties send forensic cases to UND, recognizing the department's expertise in preparing evidence for trial. In contrast to North Dakota where the state determines who runs forensic investigations, in Minnesota and South Dakota, it is county controlled.

As important as it is to solve

crimes, the true value of UND's facility comes from investigating unexplained deaths, where no foul play is suspected. “North Dakota averages about eight homicides annually,” Sens said. “We shouldn't concentrate on crime full time. We need to be working for families and for communities in family and public health.”

The new forensic facility provides an expanded ability to investigate sudden, unexplained deaths that occur at home, in the workplace, or from public health hazards.

“Hospitals in North Dakota are not big enough to have a forensic pathology facility, and yet, they need one,” Sens said. “Before the new facility, unless there were clear signs of foul play, investigations of unexplained deaths were not getting done. We now have the opportunity to do medical death investigations in a state that didn't really have that ability or had limited facilities for them. From unsuspected electrocution and carbon monoxide poisoning to work- and farm-related deaths, we investigate them all.”

Forensic pathologists at UND can directly and immediately translate findings from autopsies into treatments. A number of cases demonstrate the great value this holds for families:

- A man in early middle age who appears to be in good health dies. No foul play is involved. The autopsy reveals he suffered from hyperlipidemia, an increase in the amount of fat in the blood, which can lead to heart disease and pancreatitis. The pathologist advises the rest of the family to have their lipid levels checked, which reveals that they all have hyperlipidemia. They sought treatment and should live longer lives.
- A man dies unexpectedly. The autopsy uncovers a genetic heart valve defect. The pathologist recommends that the family see a cardiologist for screening, who finds the same defect in other family members, who have the defect surgically repaired, thus living longer than they may have without the surgery.

The new building opens up
the possibility to provide

**more services
to the state
and the region.**



- A supposedly “alcoholic” man dies. The autopsy shows what would be expected: cirrhosis of the liver; however, the autopsy also discovers that the man had hemochromatosis, a congenital disease where the victim’s body cannot metabolize iron properly and which also leads to cirrhosis of the liver. The man wasn’t an alcoholic after all. In addition, two of his family members have the same disease. The pathologist refers them to their physician for treatment, and through treatment, they are able to live knowing they will not succumb to the same fate as their brother.
- An elderly person dies in a lone car crash. The autopsy finds that the victim died of natural causes while at the wheel, which led to the accident. This knowledge provides comfort to the family in knowing that their loved one did not suffer and die from the crash injuries.
- In another crash, the woman driver is found to have had a brain tumor that caused a visual obstruction that didn’t allow her to see the traffic light.
- For parents of a child who died from sudden infant death syndrome (SIDS), the death can be overwhelming. Although SIDS remains a mystery, autopsies have helped parents to cope when they learn that it wasn’t their fault.

In public health, UND’s forensic researchers contribute by investigating deaths in the workplace as well as within vulnerable populations, such as the elderly, children, and individuals in group homes or institutions. As a part of the Prenatal Alcohol and SIDS and Stillbirth (PASS) Network, UND scientists research the role of prenatal

alcohol and other exposures in the risk for SIDS and adverse pregnancy outcomes, such as stillbirth and fetal alcohol syndrome, and how they may be interrelated. The PASS Network is working with Northern Plains American Indian communities to decrease fetal and infant mortality and to improve child health in these communities.

UND’s forensic pathologists also want to protect North Dakotans from a potential danger blowing in the wind—erionite dust. Erionite is a stone once used in western North Dakota to cover hundreds of miles of roads and that has been found on driveways and playgrounds; it appears to be associated with increased risks of fibrogenic lung disease, lung cancer, and mesothelioma (a cancer usually related to asbestos exposure). Few studies have been done on erionite in the United States. Like asbestos exposure, lung disease or cancer from erionite dust exposure may take decades to develop, so Sens and her colleagues plan to study tissue samples from the lungs of deceased North Dakota elderly to determine the exact cause of death.

“Before the new facility, the state lacked the resources to investigate the deaths of elderly North Dakotans who died from what seemed to be pneumonia but may really have been cancer,” Sens said.

In addition to contributing to family and public health, UND’s forensic science clinical practice facility will be the training ground for the physicians educated by the School who will be the future coroners in each North Dakota county. They will be trained by UND’s forensic pathologists to determine more than just final causes, but to work for the cause—the health of North Dakotans.



Susan Gail McIntyre, MS OT '64, Susan Gail McIntyre, assistant professor emeritus of occupational therapy, died July 4 at Valley Memorial Eldercare in Grand Forks with her loving family at her side. She was 70 and had resided for the last five years in Thief River Falls, Minn.

Sue was born in Grand Forks on Jan. 28, 1941, one of two daughters born to Alvin and Ruth McIntyre. She was a 1958 graduate of Central High School. She graduated from UND in 1964, earning bachelor's and master's degrees in occupational therapy.

She was briefly married to James Hultman and had one daughter. In 1967, McIntyre joined the faculty at UND, and in 1981, she was promoted to chair of the Department of Occupational Therapy. McIntyre created the Casper College (Wyo.) Satellite Program and started the shift to a master's level curriculum.

"Sue was a strong leader: assertive and direct in her interactions," said Janet Jedlicka, PhD, chair and associate professor of the Department of Occupational Therapy. "She was an innovator and visionary. She started UND's OT program in Wyoming when many others thought it couldn't be done. Our program was, I believe, the first distance program to cross state lines. She laid the foundation for the growth and development of the program at both sites."

She enjoyed watching her grandchildren play hockey and loved to knit, crochet, and quilt. Sue made the most of every moment with her family and friends.

She is survived by her daughter, Kelly Jo McIntyre-Gothberg, grandchildren, Jade Kaitlyn Gothberg, and Zane Alvin Gothberg, all residents of Thief River Falls, Minn.

Sue was preceded in death by her parents Alvin and Ruth McIntyre and by her only sister Ruth Young.

Dr. Jack Louis Nylund, BS Med '64, passed away on August 12, 2011, while on vacation in Colorado. Jack was a devoted husband, loving father, friend, and caring physician who touched the lives of many. He was born May 23, 1941, in Tucson, Arizona, and raised in Grand Forks, North Dakota. He attended the University of North Dakota, where he was an active intramural hockey player and member of the Alpha Tau Omega Fraternity.

He completed his medical degree at Wake Forest Bowman Gray School of Medicine. For his internship, he worked at Charity Hospital in New Orleans. While in New Orleans, he volunteered in the Army where he served in Vietnam as a captain of the 4th Infantry Division, a forward area clearing company. He returned to Ft. Sam Houston, where he served in the ER and burn unit.

After being discharged, he completed his radiology residency at Parkland Hospital. Subsequently, he moved to California, where he met his wife Janet; they moved to Dallas soon thereafter. He practiced as a radiologist with White Rock Radiology in Dallas, Texas, for almost 30 years in the Medical Center of Mesquite and the Doctors Hospital.



IRA Charitable Rollover

By Dave Miedema

Extension of the IRA charitable rollover gift legislation passed by Congress is valuable news for our senior School of Medicine and Health Sciences alumni and friends who are IRA owners and motivated to invest in the exciting future of the School.

Individuals who are over the age of 70½ are allowed to make tax-free IRA transfers to an eligible charity, such as the UND Foundation, of up to \$100,000 total in 2011. The transfers are not includable as income and are not eligible for an income tax charitable deduction. The IRA charitable rollover does qualify for the donor's Required Minimum Distribution (RMD). Unless Congress further extends this opportunity, the IRA charitable rollover gift option will expire December 31, 2011.

How does it work?


1. You direct your IRA plan administrator to transfer funds directly to the UND Foundation using the administrator's forms and paperwork.
2. The IRA administrator transfers funds directly to the UND Foundation.
3. We request you notify us of a pending transfer. We want to be sure we accurately record and acknowledge your gift!
4. The IRA distribution is excluded from your income.
5. Eligible transfers may be made to multiple charities provided the total amount does not exceed \$100,000 in calendar year 2011.

For additional information on how to best structure your IRA charitable rollover gift to benefit the School of Medicine and Health Sciences, please contact:



Dave Miedema,
Director of Development
School of Medicine and
Health Sciences
UND Foundation
davem@undfoundation.org
(701) 777-4933
(800) 543-8764

Your IRA charitable rollover gift to the UND Foundation may be designated for any purpose within the School of Medicine and Health Sciences, but may not be used to fund a charitable income arrangement such as a charitable remainder trust or a charitable gift annuity.

This is a unique, tax-efficient, and limited-time giving opportunity for our senior alumni and friends. Please contact me today if you would like additional information, or to discuss how you can maximize the effect of your IRA gift to benefit the School of Medicine and Health Sciences. 

UNIVERSITY OF NORTH DAKOTA
FOUNDATION

Charitable IRA ROLLOVER

What is an IRA rollover?

Congressional legislation provides opportunity for you to make a charitable gift by transferring funds from your Individual Retirement Account (IRA) to the UND Foundation.

Is there an age requirement?

To make a charitable IRA rollover, you must be at least 70 1/2 years of age.

Is there a limit to how much money I can give?

Total charitable gifts using an IRA rollover may not exceed \$100,000 per taxpayer, per year.

How long do I have to make a gift from my IRA?

Current legislation has set Dec. 31, 2011 as the last day this type of gift can be made. To take advantage of the Charitable IRA Rollover, it's important to make timely arrangements with your IRA custodian to ensure your gift is processed in time to meet the deadline.

PARTING SHOTS



April Coming Hay jubilantly receives her coat from Dean Joshua Wynne at the White Coat Ceremony on August 5.



Sarita Eastman celebrates at the Summer Undergraduate Research poster session held on August 11.



Seventy-eight students in Grades 7 through 12 participated in the six-week Indians Into Medicine Summer Institute on the UND campus.



On August 23, the temperature was up—92°F—as was the activity level at the School on the first full day of classes.



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For more information on the North Dakota tax credit opportunity, please contact Dave Miedema, Director of Development, School of Medicine and Health Sciences at davem@undfoundation.org, call 701.777.4933 or 800.543.8764 or visit spirit.und.edu.

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