



Inspiring WOMEN in STEM

Honoring women who inspire and encourage
the next generation of STEM leaders

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Heritage Month

STEM+M Health Professions Pipeline Program Creates Opportunities for Hispanic High School, Community College Students



By Lisa McBride, PhD

Science, technology, engineering, and mathematics (STEM) skills are necessary now more than ever to compete in a global economy. Improving access to quality STEM education will raise the caliber of the U.S. workforce, drive economic growth, and keep the U.S. competitive. STEM advocates beat the drums for more engineering and computer science talent, but the demand for STEM-savvy professionals in healthcare is often not discussed.

According to the U.S. Bureau of Labor Statistics' *Occupational Outlook Handbook*, employment in healthcare occupations is projected to grow 19 percent from 2014 to 2024 — much faster than the average for all occupations — adding about 2.3 million new jobs. This growth is attributed to an aging population and federal health insurance reform that is increasing the number of individuals who have access to health insurance.

With a growing aging population, the demand for physicians has intensified, and communities around the country are already experiencing physician shortages. A 2016 study published by the Association of American Medical Colleges predicts that by the year 2025, the U.S. will face a shortage of between 61,700 and 94,700 physicians, posing a risk to patients.

These shortages are due mainly to the myriad weaknesses of American K-12 education in science and mathematics, which international comparisons of student performance rank as average at best. It is without question that we want our doctors to know more than

a smattering of math and science. Students wouldn't even make it through the door of a medical school, after all, without a heavy dose of STEM coursework — and high achievement in those areas — in addition to medical subjects (referred to as STEM+M).

Although overall employment in healthcare occupations is projected to grow, not enough students are pursuing degrees and advanced training in the STEM+M fields to meet the increasing demand. The lack of representation in STEM+M is even more pronounced among Hispanics, who, although they

professionals in healthcare is critical. The Hispanic population is expected to reach about 106 million by 2050, close to double what it is today, according to new U.S. Census Bureau projections. As this population continues to increase, we need more Hispanic leaders and role models in healthcare to help overcome health disparities affecting those communities.

To address the dearth of Hispanic health practitioners, Philadelphia College of Osteopathic Medicine (PCOM) has been working with two

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accounted for 18 percent of the U.S. population in 2015, earned only 9 percent of all certificates and degrees awarded in STEM fields between 2012 and 2013. Even more startling, according to the American Medical Association Physician Masterfile, is that only 5 percent of practicing physicians in the U.S. are Hispanic. In 1980, there were 135 Latino physicians for every 100,000 Latinos in the U.S. By 2010, that figure had dropped to just 105 per 100,000. Meanwhile, the rate of non-Hispanic white physicians increased from 211 for every 100,000 to 315 per 100,000.

The need for more Hispanic

of the city's largest Hispanic-serving educational institutions — Aspira Inc. of Pennsylvania Schools and Esperanza Inc. — to help raise interest in STEM+M at the high school and undergraduate level and to encourage Hispanic students to pursue health profession careers. As part of these partnerships, the college launched the PCOM Opportunities Academy. This intensive five-week pilot program that began in July is designed to provide a pipeline that routes motivated students with an interest in STEM+M toward four-year degrees and health professions training programs.

Each week of the PCOM Opportunities Academy focuses on one of the five main disease categories: cardiovascular, neurological, kidney disease and diabetes, and infectious disease and cancer. This year's lectures were led by PCOM students, faculty, and alumni. When surveyed, participants indicated that their most memorable experience was seeing their first cadaver. One student recalled, "It didn't initially feel quite right to call it a person; it can't breathe, its skin isn't the right color, and it reeks of preservative fluid." Some students were even reluctant to hold an enlarged heart during an exercise that examined its anatomy.

Other lectures focused on cardiovascular pathology and pharmacology, neurosurgery, neurological physical exams, brain tumor resection surgery, nutrition and diabetes, blood glucose levels, an introduction to microbes, hand washing, modes of transmission for popular diseases, and osteopathic manipulative medicine, as well as an examination of the Tuskegee Experiment.

In addition, the 35 students in the Academy's inaugural class went on field trips to places such as the Franklin Institute and the Mütter Museum; were provided with SAT and ACT preparatory materials; were mentored on topics including dining room etiquette and study skills; and took part in biomedical, behavioral, clinical, and social sciences research. PCOM staff also discussed the undergraduate and medical school admissions processes and scholarship opportunities and provided career advice.

In the long term, faculty from PCOM, Aspira, and Esperanza will collaborate year round on curriculum development at partner schools and track students' performance in STEM+M skill-building activities, as well as evaluate whether there are changes in students' career goals and confidence levels.

With this sense of urgency to increase diversity in the healthcare industry comes the immediate need for more Hispanic talent in the medical

community. The gap will not be closed any time soon if the percentage of medical school graduates does not better reflect the U.S. population. Continuing its mission to train physicians for practice in underserved communities, PCOM aims to build weak academic STEM areas via the PCOM Opportunities Academy to help Hispanic students avoid the remedial classes that can slow or stall their college progress. The college is actively reaching out to Hispanics to educate them about career opportunities, as well as health issues affecting the broader community—especially those being exacerbated by tensions between the healthcare industry and Hispanic patients.

As a medical institution, PCOM is in a unique position to create the ultimate case study and best practices for building a pipeline of Latino healthcare professionals, according to Dr. Antonia Novello, the first woman and first Hispanic to serve as U.S. Surgeon General and the keynote speaker at the PCOM Opportunities Academy's recent graduation. Novello recommends that to bolster the number of medical school applicants, institutions—like PCOM—must "get involved in the teaching of science as early as junior high school and continue such interest throughout high school in pursuing healthcare occupations."

"Obviously the economics are a crucial aspect of why minorities don't go to medical school," Novello said, "but also important is the early training, the role models, and the people who believe that they can get to the top of their careers. That's why I feel [this] accelerated and intensive STEM+M-focused preparation academy is on the right track to making this a reality."

Lisa McBride, PhD, is the chief diversity officer for the Philadelphia College of Osteopathic Medicine (PCOM). She is also a member of the *INSIGHT Into Diversity* Editorial Board. PCOM is a 2015 *INSIGHT Into Diversity* HEED Award recipient and a 2016 *INSIGHT Into Diversity* Diversity Champion.

out women
engineers
are
inspired
thoughtful
intelligent
creative



JOANN BROWNING, PH.D., P.E.

- Dean of the UTSA College of Engineering
 - David & Jennifer Spencer Distinguished Chair
- A leader in structural engineering and concrete research, Dr. JoAnn Browning recently received a 2016 Inspiring Women in STEM Award from *INSIGHT Into Diversity* magazine.



LEARNING THROUGH HANDS-ON EXPERIENCE

Founded in 1899, Philadelphia College of Osteopathic Medicine (PCOM) was one of the nation's first osteopathic medical schools. PCOM is known for its spirit of collegiality and camaraderie. Student/faculty collaboration is common, with students working alongside faculty conducting research, coauthoring articles and presenting at professional conferences. Faculty work across departmental lines on innovative research through the College's Center for Chronic Disorders of Aging.

PCOM students learn the importance of health promotion, education and service to the community and, through the College's Healthcare Centers, provide care to the medically underserved populations in inner city and rural locations.

Georgia Campus – Philadelphia College of Osteopathic Medicine (GA-PCOM) is a private, not-for-profit branch campus of the fully accredited Philadelphia College of Osteopathic Medicine, a multi-program institution with a more than 100-year tradition of educational excellence. Offering students a high-tech, collaborative learning environment with hands-on educational opportunities, GA-PCOM features state-of-the-art classrooms and labs, along with an osteopathic manipulative medicine clinic which is open to the public by appointment.

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PCOM Opportunities Academy

Training the next generation of healthcare professionals

To address the lack of Hispanic/Latino healthcare professionals, PCOM has launched an innovative pipeline program for high school students: the PCOM Opportunities Academy.

The two-week academic summer camp provides exposure to the wonders of math and science and the various career paths within the health care profession via lectures, demonstrations, hands-on research in the anatomy lab, job shadowing opportunities and field trips to the region's prestigious scientific institutions.

The primary goal of the PCOM Opportunities Academy is to inspire students to pursue training and/or degree programs in the science, math, engineering, technology and medical (STEM+M) fields.

You can help change the life of a child by making a donation or becoming a program sponsor today.

For more information, please contact:

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