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BGSU Monitor

MARCH 22, 2011

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Top Stories

Exercise could speed wound healing in diabetics, BGSU research shows

There's just no getting around it. "We were designed to move and when we don't, we experience all sorts of problems," says Dr. Todd Keylock, an exercise science faculty member in the School of Human Movement, Sport and Leisure Studies.

Keylock is researching the connection between exercise and the immune system and, specifically, whether activity can improve wound healing in diabetics. Healing is slowed by chronic inflammation, and if exercise can reduce or prevent that inflammation, serious problems may be averted, Keylock said.

Because of its connection to skin health, Keylock's research has been reported in Allure magazine, Health, Dermatology Times, The Journal of the American Medical Association and other publications.

Diabetes rates are soaring in the United States as people are increasingly sedentary and obese. In fact, Keylock said, what used to be known as adult onset diabetes is now frequently being seen in children due to their being overweight. According to National Diabetes Information Clearinghouse figures for 2007, estimated diabetes costs in the U.S. totaled \$174 billion in medical costs, disability, work loss and premature mortality.

One of the dangers posed by the disease is slower healing of wounds, which can lead to infection and even loss of limbs. Here's where movement comes in. In addition to the well-known benefits of exercise—increased flexibility, heart health—Keylock suspects that physical activity also plays an important role in preventing and reducing chronic inflammation. Chronic inflammation has been shown to be a major culprit in a number of illnesses, from heart disease to Alzheimer's, cancer and HIV-AIDS, in addition to diabetes.

While inflammation is a healthy response to infection or even a splinter—a process in which the body signals the brain to send immune cells to the trouble spot to fend off the invader—"when inflammation gets too high and becomes a chronic condition, damage to the body occurs," Keylock said.

Keylock is testing his wound theory in the laboratory. One indicator of inflammation is high levels of C-reactive protein (CRP) in the blood. Keylock is measuring CRP in people with high and low levels of activity as well as inflammation levels in wounds in diabetic laboratory animals, comparing those levels in the inactive to the active animals.

"While the mechanism by which activity reduces inflammation is as yet unclear, there is a growing body of evidence that it does," he said.

"Although drugs can help reduce inflammation, pills are a less than ideal way of solving the problem. We think regular, aerobic exercise can maintain and restore health by reducing chronic inflammation." It is already known that regular exercise can help keep blood glucose levels down, another indicator of its importance to health, he added.

However, in the case of diabetes, exercise alone cannot solve all the problems. "It has to be a combination of lowered calories and exercise to achieve weight loss. Exercise scientists know we can't do this alone," he said.

Keylock wants to get people moving across their lifespan since higher inflammation naturally occurs with aging. "I try to spread that passion to my students," he said.

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Doctoral student helps preserve disappearing art form

J.L. Murdoch left her first Talchum performance bruised, bloody and exhausted. Murdoch, a Ph.D. student, was in a rural part of South Korea as part of a Fulbright Fellowship for Research to study the little-known performance art. The word talchum means a form of play or dance performed while wearing masks.

"In total, it took about 27 hours of travel time in-country before I even saw my first performance," she remembered. "Once you're there you have to fight the crowd to get a position to see. I was physically hurt and my hand was bleeding from trying to get through."

Murdoch hopes her research will introduce people to the art form, but says Talchum is also struggling to survive in its home country.

"Some people think in a generation it will disappear entirely, while others are involved in its preservation and are reaching out to spread the word."

The masks can represent everything from a monkey to a monk. They are often embellished with natural items such as gourds or bark, and can be very colorful. Most of the masks have long muslin fabric attached to the back to represent hair. Fur is sometimes used to accent them, while many have disfigurements, meant to show the moral fiber of the character.

Gender roles also play a part in a mask's development. Some of the male versions have a hinged jaw meant for speaking, while many female masks are missing a mouth altogether, signaling that they are expected to be silent.

There are 13 preserved forms of Talchum, and Murdoch learned five of them during her time in South Korea. "I did perform in a front of an audience, but not in a mask. It was more of a recital for the class and there usually aren't enough masks to go around."

Talchum is performed in a series of vignettes with often surprising subject matters. "The plot lines can often include a lot of sexual innuendo and be pretty raunchy. I went to one performance where women heckled the actors the entire time and took the innuendo to the next level."

Thanks to her experience, Murdoch says she now meets challenges in her life and research in a new, more productive way. "I had to build trust with the Koreans so I could truly learn about the culture. I actually ate sea slugs and live baby octopus.

"Living in a country and being so immersed you learn to ask a variety of questions and to step back and see where the other person is coming from. It has helped me navigate my daily conversations."

Murdoch is applying for grants and is hoping to work in a situation where she can make more regular trips to South Korea.

Dr. Scott Magelssen, theatre, says Murdoch's dissertation will get people talking. "It will really blow the lid off the English-language discussion of this art form. The research to this point hasn't gone very deep, and this will definitely be sought-after scholarship."

Hemminger living lessons learned as Givens Fellow

Paul Hemminger may have completed his trip to Mombasa, Kenya, but his lifelong mission to help humanity is far from complete.

The senior from Sandusky majoring in marketing was one of BGSU's Stuart R. Givens fellowship recipients. The fellowship provides students support to design their own learning experi-



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ence almost anywhere in the world.

Hemminger wanted to help alleviate spiritual, emotional and financial poverty. He completed a three-month microfinancing internship through the Foundation for Sustainable Development. Microfinance is a general term used to describe financial services for low-income individuals or those who do not have access to typical banking services, Hemminger said.

The experience changed him as much as it did those he set out to help. "You're more equipped to create something that will last," he said. "It made me think and dream big. It made me step out of BG."

Through his internship, he learned about culturally sensitive development and how to improve the quality of life for lower-class individuals. He worked with impoverished local entrepreneurs and helped teach them how to lift themselves out of poverty by tracking their personal finances, developing business ideas and creating networking outlets.

"It was hard collecting and distributing loans; it was hard to get the hang of it," he said. Hemminger got his first taste of success when he was the first student of his group to lead one of the entrepreneurship forums.

"About 400 people showed up," Hemminger remembered. "It was so exciting. I stood up in front of everyone and smiled and laughed and said, 'Thank you, thank you! Thank you for coming!'"

Some of his most memorable experiences happened outside of work. He lived in an enclosed, two-bedroom house with steel-barred windows. Every morning, he woke up sweating inside a mosquito net.

"I used so much bug spray and lotion at night and I wore long sleeves," Hemminger said. "But during the night, I had to sleep in a mosquito net or else I would have gotten really sick. I did get malaria."

He lived with his host mother, Mama Pamela, and her nephew, Collins. Mama Pamela usually prepared a breakfast of hot water, a bowl of beans, and a few pieces of bread.

He especially enjoyed the Kenyan culture, including dancing, watching the World Cup and spending time in a local bar. He met a group of local boys with whom he spoke Swahili, which is uncommon for a non-Kenyan to speak. "I tried to teach them about science, math and business; they were so eager to learn."

Hemminger hopes to work this fall for Affirm Global Development, a Bowling Green-based company that provides solar lights for impoverished cities in countries like India and South Africa. He also created and is now co-CEO of Net Impact BGSU, an organization that promotes sustainable and beneficial change throughout the campus and community.

"There's a balance between wanting to change the world, and realizing that you can't," Hemminger said. "You constantly have to harmonize between optimism and realism. I don't think that anyone that exists in this development world ever feels completely accomplished." In the future, he hopes to work for a university to empower students to travel and dream big, he said.

"It's not okay to not know what's going on in the world," Hemminger said. "It's not okay to not smile at people you pass on the sidewalk."