USU obesity study now open to all children of service members

By Eric D. Ritter

The Uniformed Services University’s (USU) Developmental Research Laboratory on Eating and Weight Behaviors at USU’s F. Edward Hebert School of Medicine is looking for adolescent military dependents for a volunteer program to help understand and prevent obesity and eating disorders in children of military members.

According to professor of Medical and Clinical Psychology and Director at the research lab, Marian Tanofsky-Kraff, Ph.D., obesity rates among children of military members is nearly parallel to the civilian population. Also, the rates of disordered eating in military adolescents may be high – or more problematic - than in civilian youth. In fact, previous data suggest that military personnel may be more likely to engage in disordered eating.

“Part of being in the military is ‘making weight’, and trying to control weight can sometimes lead to disordered eating behaviors,” she said. “Since military dependents are more likely to go into the military, and many of them are boys, both male and female children of military parents may be at high risk for disordered eating.”

Earlier this year, USU held a similar study, but it was only open to girls. However, prior research suggests that men in the military may have the same rates – or actually higher rates of disordered eating than military women. She said that data goes against data in the civilian world.

Interestingly, obesity and eating disorders often co-occur. She said this study is important, because it may help identify an approach to prevent both obesity and eating disorders.

Obesity isn’t just a problem of the health of the dependent. Tanofsky-Kraff also said it is costing the Military Health System around $1 billion to treat morbidities associated with obesity. She also said identifying disordered eating in adolescence is important, because she has determined that many adults with eating disorders began in their adolescent years.

She said they believe one main factor military dependent children face more than civilian children is a higher level of stress.

“Adolescent military dependents can experience stress due to moving often, stress from their parent’s career and other disruptive factors,” she said. “This may cause them to overeat or use food to cope.”

Tanofsky-Kraff said she doesn’t believe those children from the military members are necessarily at a greater risk for an eating disorder, but the environment they are in can have an effect.

The study is ongoing and is in collaboration with Walter Reed National Military Medical Center (WRNMMC) and Fort Belvoir Community Hospital. Groups are being run at both sites and at Ft. Meade.

Some of the aspects she said the study will involve is weight tracking, disordered eating such binge eating or bulimic episodes, obesity-related physiological measures. The data collected will be used to help understand weight gain trajectories and prevent worsening eating problems and metabolic functioning among the dependents.

To receive more information about volunteering, call 301-295-1598. Qualified individuals who volunteer will be compensated for their time.
Avatars to offer new realism in training

By MC3 Laura Bailey

Members of the class of 2018—military medical students at the F. Edward Hébert School of Medicine (SOM) at the Uniformed Services University of the Health Sciences (USU)—will be the first to use a new simulated technology in January 2016.

Since 2001, USU’s SOM students going through their Psychiatry clerkships in the National Capital Area have come weekly to the Val G. Hemming Simulation Center (SIMCEN) to train with paid actors who portray patients (standardized patients) visiting a simulated clinic. Standardized patients are the “gold standard” of simulated training, because they allow students to practice their clinical skills in a realistic and controlled environment with real people. However, paid actors can be costly, said Air Force Col. (Dr.) Rita L. DuBoycie, the principal investigator of the Virtual Patient (VP) project and senior director of clinical education at USU’s SIMCEN. Patient simulation is about to get even better for USU SOM students with the launch of VP, a computer program developed by the University of Southern California (USC) Institute for Creative Technologies (ICT).

Using virtual human technology to create life-like avatars, the VP will train USU clinicians in interpersonal areas such as rapport, interviewing and diagnosis, much like standardized patients do, but without scripts to memorize, coaching for the actors and expensive hourly wages.

In addition to cutting costs, other benefits include ease of access and variety.

The future VP system will be delivered over the web and mobile devices such as tablets for easy and continuous training, according to the USC ICT website. Virtual patients will be available 24/7 and can portray a multitude of conditions that might be difficult for actors to represent or repeat with success.

The fact students will be able to access the program easily is a big benefit, because it means more practice for the students, said Duboyce.

“We want them to make all their mistakes here while they’re practicing so they can safely learn from them and avoid making those same mistakes with real world patients,” she said. “I think it could work really well for remedial instruction as well – for those students who may be struggling and need the extra practice. Also, having an array of characters available from elderly and young patients in different genders and cultures is really great.”

This technology is the wave of the future, said Duboyce. But even though VP is geared toward today’s generation of young, tech-savvy medical students, VP by no means replaces standardized patients. The two methods will work together and provide a more well-rounded learning experience for SOM students and ultimately give real-world patients a more prepared doctor in their time of need.

“I think our students are really going to like using the program,” she added. “A lot of time has gone into the preparations for this launch – more than a year from start to finish, which included writing the grant proposal, waiting for the approval and funding, then authoring the program to depict certain scenarios for the students. I’m really excited to see how the students do with the addition of Virtual Patient. We plan to launch the program to our first batch of SOM students sometime in January 2016. The class of 2018 will be USU’s pioneers for the program, but I think in a fun way. I’m confident the program and the students will do well.”

Air Force Col. (Dr.) Rita L. DuBoycie, the principal investigator of the Virtual Patient (VP) project and senior director of clinical education at USU’s SIMCEN monitors a simulation program used to aid in more realistic training for students. (Photo by MC3 Laura Bailey)
USU, WRNMMC 3-D printing offers better quality of life for some patients

By Eric D. Ritter

3D Printing has quickly gone from something out of a science fiction movie to something that is printing things we either come across on a daily basis or can conceptualize on a computer screen.

Numerous applications have been developed in the 3-D printing field such as every day household items, prosthetic limbs and even animal and human cells for research or medical treatment.

The Uniformed Services University (USU) radiology department is collaborating with Walter Reed National Military Medical Center (WRNMMC) to 3-D print items and devices that will help doctors with patient care and help improve the quality of life for wounded warriors.

According to WRNMMC 3-D Medical Application Center 3-D Printing Service Chief and assistant professor in USU’s Department of Radiology and Radiological Sciences, U.S. Air Force Maj. (Dr.) John Lichtenberger, using the 3-D technology will better the lives of many of the hospital’s patients.

“We are primarily using this technology to improve the quality of life for patients such as our wounded warriors,” Lichtenberger said. “For example, after an amputation injury, we work in an interprofessional environment to design and print custom, personalized prosthetics. We have even made a device that can help a wounded warrior attach a fishing pole to their prosthetic arm. That’s one example of how we are meeting their needs of a better quality of life.”

Lichtenberger did add that the prosthetics they print at the hospital are not the mechanical prosthetics that have been seen going viral on the news and social media recently. They primarily focus on designing and printing what patients need for their medical and surgical care and to improve the quality of their day-to-day activities.

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WRNMMC 3-D Medical Application Center 3-D Printing Service Medical Director, Kevin Wurth, displays a fabricated metal plate to be attached to a patient’s skull that was developed using 3-D printing technology. (Photo by Eric D. Ritter)
“Sometimes a whole prosthetic limb is not what they want,” he said. “For example, someone who lost their legs may not want to put on full-sized prosthetic legs to go just a few feet or when they need more mobility such as working on a car. We can print out titanium plate prosthetics that can be comfortably and easily attached to the residual limbs to protect them. In addition to that, we also create a lot of cranial and oral implants for patients who require surgical implants. Those prints are used in the medical care of patients and help the patients become more functional.”

Lichtenberger said many of the computer models used for the 3-D prints are designed by graphic artists who add a great deal of expertise and aesthetic to the products. However, the graphic artists there aren’t just trained graphic artists. They are also trained CT techs.

“They bring a lot of image-processing knowledge to what we are doing,” he said. “They have an intimate knowledge of the layers and angles of the images and then transfer that into the computer model that will be used in the print.”

The other major significance of being able to print a model based on MRI and CT scans is that it can print specific areas of the body without the need for a surgeon to perform an operation in order to physically see the area they need to see. It can print out specific vessels, muscles and so forth.

“It really does minimize operating time,” he said. “It helps the medical team understand the patient before the surgery begins. In fact, they may even be able to see anatomic relationships they may not have anticipated like a vessel near a tumor that they should be aware of and will know to address it during surgery. Whenever we can assist with surgical planning and minimize surgical time like this, it will benefit the patient.”

3-D printing has actually been around since the mid-1980s. However, its purpose was more to create machine parts in the industrial sector. The medical applications in 3-D printing have only recently taken off. Lichtenberger said the hospital doesn’t yet have the ability to print with cells to make human tissue, also known as bioprinting. However, it is something they plan to add in the near future.

The three printer types Lichtenberger said they use at the hospital are the Electron Beam Melter (EBM), which melts metal powder layer by layer with an electron beam to fabricate a print, Fused Deposition Modeling, which lays down material like acrylonitrile butadiene styrene (ABS) plastic in layers until the print is finished, and Stereolithography which can lay down clear material like plastics and produce larger prints such as a human pelvis.

There’s also a major time benefit to these 3-D prints. Previously, for many prosthetic pieces, for example, molds needed to be made, and then the molds would be sent off to be developed at an off-site manufacturer. The 3-D-printing ability has eliminated that step and can print out a product for a patient that day instead of waiting.

“This is ultimately all about personalized patient care,” he said. “This is giving the patient the products they need to live a better life, and it provides doctors with a quality and accurate product that assists them in better medical care.”
WAVE simulator provides realistic field medical scenarios at Val G. Hemming Simulation Center

by MC3 Laura Bailey

CH47 Chinook helicopters land under fire in the Khyber Pass, Afghanistan to a mass casualty air disaster. Two wounded airmen lay on the ground nearby. One is unconscious and bleeding heavily from the knee where his leg has been blown off and the other, with visible wounds to the abdomen and chest, is in a state of panic.

Over the sounds of bomb blasts, rapid gunfire and sirens, her desperate screams for help call combat medics into action. Staying close to the ground in a military crawl, they make their way through blasts, shooting debris, clouds of smoke and heavy enemy gun fire, to reach the wounded.

The medics are on a dangerous rescue mission: save lives even while putting their own lives on the line. One medic says to the wounded, “We’ve got you. You’re going to make it.” He and his team quickly apply bandages and tourniquets.

Stop the bleeding. Check. Monitor vital signs. Check. Working diligently through the distracting sounds of a most hostile environment – the medics remain undeterred.

Like a dream that ends upon waking, the completed training scenario comes to a halt. Bright lights come on inside the Wide Area Virtual Environment (WAVE) at the Val G. Hemming Simulation Center (SIMCEN) at the Uniformed Services University of the Health Sciences (USU). The wounded role-player jumps to her feet completely unharmed. Sound effects dissipate into silence and a smoke machine exhales its final plume as SIMCEN staff enter the scene to reset the mannequin for the next

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USU students compete for expert field medical badge

by Sharon Holland

Fourteen members of the F. Edward Hébert School of Medicine class of 2018 competed against 108 other candidates for the Expert Field Medical Badge, Dec. 15-18, 2015, at Fort Irwin, California. When it was all over, half of them walked away with coveted badge.

The soldiers spent 72 hours on the vast training base located in the Mojave desert vying for the badge, which is considered one of the Army’s most difficult and prestigious to earn. According to the Army Medical Department (AMEDD) website, “the EFMB test is the utmost challenge to the professional competence and physical endurance of the soldier medic. It is the most sought after peacetime award in the AMEDD, and while the Combat Medical Badge is the ‘portrait of courage’ in wartime, the Expert Field Medical Badge is undoubtedly the ‘portrait of excellence’ in the army all of the time.” Over the last 50 years, members of the U.S. Army, Air Force and Navy medical departments, along with their counterparts from allied nations, have had the opportunity to compete in this grueling competition, in the hopes of earning the EFMB.

Candidates completed a series of training lanes where they were tested, while under “enemy” fire, on combat care and various military survival skills. Candidates also took a comprehensive written exam on the skills they learned, completed day and night land navigation, and if they made it to the end, finished a 12-mile road march in full gear, within three hours.

The pass rate for the badge typically falls between 15 and 20 percent. “The members of my class achieved an outstanding 50 percent pass rate,” said Army 2nd Lt. Andrew Jacobson, president of the SoM Class of 2018.

This year’s USU EFMB recipients include Army 2nd Lts. John Blickle, Rachel Bridwell, Charles Llewellyn, Thomas Peterson, Oriana Ellis, Kimberly Gerling, and Kaoru Song.

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“Last year, this center supported about 36,000 active duty training hours,” said Gil Muniz, the deputy director of the center. “We support the military’s medical students at USU, as well as medics from the military and civilian first responders. Keeping all of this as close to reality as possible is key. And with our trainers right there, we can give immediate feedback and make sure when these medics hit the real reality, they’ll be ready.”

Unlike simulators that use computer monitors or head-mounted displays, the 8,000-square-feet virtual space created by the WAVE allows up to 18 team members to interact with each other and real equipment, and gives instructors the opportunity to teach and assess teamwork skills. Stereoscopic images are displayed on the screens with paired DLP projectors while users wear lightweight stereoscopic glasses to view the scene. The WAVE boasts two pods 20 feet in diameter, eighteen 9-feet tall and 12-feet wide movie screens surrounding the two pods, 144 image projectors, a 5.1-channel sound system that generates a “soundscape” to enhance the realism of the experience with flying bullets, screams and explosions, and smoke generators and debris scattered across the floor to add to the mayhem. One pod simulates the aftermath of the first scenario such as a firefight. Students evacuate patients along the corridor to the second pod where a second scenario such as helicopter transport plays. Meanwhile the first pod is being restaged as a field hospital. Thus training can be sustained in real time for extended periods.

“The WAVE is the world’s largest virtual environment for medical training,” said Dr. Alan Liu, director of the Virtual Medical Environments Laboratory and creator of WAVE. “It’s a room with 24 3-D screens that puts users inside a virtual reality game, surrounding and immersing medics into any kind of environment – from downtown Iraq in the middle of a firefight to inside a cargo aircraft. “There’s nothing else like this in the world.”
USU held its annual Holiday Party on Thursday, Dec. 17. Events and activities included games, music, dancing, a photo booth, Combined Federal Campaign giveaways, and a visit by Santa Claus. (photo by Sharon Holland)