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# NSSC **This Week**



Natick Soldier Systems Center Public Affairs Office

Photo: Staff Sgt. Adam Mancini

**USARIEM developing tool  
to reduce altitude sickness  
in deployed Soldiers**

# Peak Performance

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- **Up from the darkness**
- **Remembering 9/11**
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**“Soldiers have to perform in the mountains. We know lack of oxygen impairs health and performance.”**

Dr. Stephen Muza, U.S. Army Research Institute of Environmental Medicine

It's no secret that Soldiers must prevail in all kinds of terrain and climates to complete missions. Afghanistan, for example, boasts mountains with elevations higher than 24,000 feet.

Many Soldiers who have deployed to high altitudes without the proper time to adjust have learned the hard way that they are probably going to get sick.

“Rapid ascents without sufficient time to adapt to altitude can lead to acute mountain sickness or AMS,” said Dr. Stephen Muza, acting division chief for the U.S. Army Research Institute of Environmental Medicine's Thermal and Mountain Medicine Division. “This condition, marked by nausea, fatigue, headache and gastrointestinal distress, can really throw a wedge into a mission when not planned for.”

Abrupt exposure to high altitude negatively affects mental and physical performance and overall health because it lowers the oxygen supply to the body's tissues for a significant

amount of time. This condition, known as hypoxia, is what leads to altitude sickness.

“You also see a performance decrement at altitude,” said Muza. “A Soldier may not be able to carry as heavy a load as they are used to or even march at speed.”

This summer, like many summers before, researchers from USARIEM's Thermal and Mountain Medicine Division traveled to Pikes Peak in Colorado to study the physiological effects of AMS.

“Soldiers have to perform in the mountains,” Muza said. “We know lack of oxygen impairs health and performance. Currently, we are developing a tool that will give commanders a validated predictive model that accurately tells them at what point a Soldier may feel the effects of AMS and the likely severity of the symptoms.”

Annually, researchers from TMMD make the trek to perform research at Pikes Peak because it allows them to validate the studies they

conduct in the altitude chamber in Natick, Mass., while replicating a forward operating base environment similar to ones in Afghanistan. Also, Pikes Peak has what Muza calls the “ideal research elevation” of 14,000 feet, allowing for significant impairment without making people dangerously sick.

This year's study concluded a two-year study. Researchers from USARIEM collected data on 70 men and women who were exposed to four different altitudes at different activity levels to validate their previously published predictive model of AMS, which suggested that altitude, time at altitude, gender and physical activity level are significant predictors of AMS.

**Peak Performance** *continued, inside back cover*

# Peak Performance

**Army developing tool to reduce altitude sickness in deployed Soldiers**

By Kelly Sullivan, USARIEM Public Affairs / NATICK, Mass. (Sept. 17, 2013)

Silouan Green — a writer, musician, post-traumatic stress disorder survivor and motivational speaker — was in a tragic jet crash while serving as a U.S. Marine. A host of complications and medical conditions followed, lowering him into the hell of PTSD.

Green suffered from depression, suicidal impulses, long-term pain, and a completely shattered life. At that point, Green was given a choice: continue down the same devastating path, or live free.

He chose to live free.

He found his purpose after surviving PTSD, and now brings hope to people struggling to live and who are overcome by darkness.

“Darkness doesn’t have to consume us. I know this is true because I’ve been there,” Green said. “If things are so bad that we become tired of living, what do we have to lose by building a life that can overcome the darkness and give us deep purpose and meaning? We have little to lose and everything to gain.”

Green spoke to the personnel of the Natick Soldier Systems Center Sept. 12, as part of National Suicide Prevention Month.

Experts say suicide is the 10th leading cause of death in the United States. About 90 percent of suicide victims had an underlying mental health issue, and many who chose to end their lives spent their final moments suffering in silence.

Former Rhode Island Congressman Patrick Kennedy is a spokesman for the American Psychiatric Association.

“Mental health affects your whole body, and you really can’t treat anything else if you’re not also treating your mental health,” Kennedy said.

Heather Leiby, director of NSSC’s Army Community Service, wanted to get involved.

“Often, when we think of PTSD, we think of the combat Soldier,” Leiby said. “But PTSD can affect other people, as well.”

With this, Leiby said she thought of a starting point to open the discussion here at Natick. Leiby researched and reached out to Green to be a part of the dialogue.

Green has done work with the Army, the National Guard, the Marine Corps, at Walter Reed National Military Medical Center and with numerous other groups, all while sharing his own journey and helping others to begin theirs.

#### UNDERSTANDING AND RESPONDING TO PTSD

Green said anyone can overcome PTSD and live.

He added that those suffering from PTSD can overcome it and “have an awesome life.”

Green went on to say that PTSD is developed and anyone can be “broken.”

“It doesn’t matter how tough you are, how resilient you are, what kind of training you get; anybody can be broken,” Green said. “It’s not a matter of weak or strong.”

Lastly, Green stated that we have to be proactive.

“The nature of PTSD is such that you want to keep it inside, keep it locked away; you’re not going to ask for help,” said Green. “We’ve got to help people, interact with people, engage them.”

Green told a story of the first time he met an Air Force psychiatrist; he immediately felt that the Air Force major would know nothing about what he was going through, and couldn’t possibly help him with his issue. Green thought, “What are you going to talk to me about?”

“But thank God, that woman cared more about me than I cared about myself. And she taught me a lesson,” Green said.

Green explained that when he looked in that major’s eyes, he could see that she truly cared about him. He went on to say that the major helped him realize that he was not PTSD.

“I was more than that,” Green said. “Trauma gives us tunnel vision because we lock it away and this monster is trying to get out. She helped me see that was not who I was.”

#### THE LADDER UPP

The “Ladder UPP” (Unlimited Personal Potential) program began when Green started speaking to prison inmates. The program is for anyone struggling to manage life’s transitions, and it is based on Green’s own transformation.

The entire program is now available as self-paced online modules:

Module One: Reveal — You are guided through answering the key questions that will help you understand and come to terms with the struggles you have been having.

Module Two: Rebuild — You will map out your current “house” and begin to design your future.

Module Three: Start the Journey — Put your design into action and begin your own Path to Freedom.

Green stressed that we as a community have to do our part.

“We need a community; you’re not going to wear the uniform forever. All of us need to be aware of it and we need to start training these men and women earlier so they’re ready for it,” Green said. “But it’s going to take all of us; no one organization is just going to have the answer. We all have to be willing to sit at that dinner table and say, ‘What can I do, what burden can I carry for these men and women?’”

#### BE PASSIONATELY PRESENT

“There’s an extreme feeling of helplessness,” Green said. “The most effective therapies help regain a feeling of control; PTSD is a loss of control, (and) when you realize the lack of control that you have, you try to control other things.”

Green said we should look “forward, not backward, with goals and a clear purpose.”

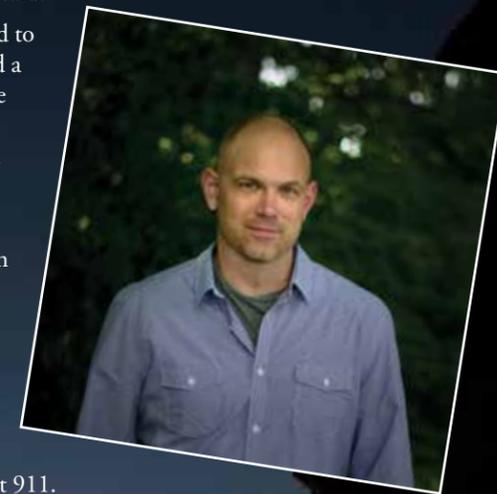
And finally, we must replace old identities with new ones.

“You’ve got to go from being broken to being free and alive with possibilities,” Green said.

“We are all different, and we all respond to different things. This is why I’ve created a variety of materials that all proclaim the same message of freedom,” Green said. “You can move out of the darkness to a place where you can live free.”

For more information about Silouan Green’s story or to contact him, you can go to his website at [www.silouan.com](http://www.silouan.com).

If you are having thoughts of suicide — or any harmful behavior — you are strongly encouraged to call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255) or your local emergency services professionals at 911.



# Up from the Darkness

By Tazanyia Mouton, USAG-Natick Public Affairs / NATICK, Mass. (Sept. 17, 2013)

“It doesn’t matter how tough you are, how resilient you are, what kind of training you get; anybody can be broken. It’s not a matter of weak or strong.”

Silouan Green

On the 12<sup>th</sup> anniversary of the September 11 attacks, Natick reflected on a day that changed us as individuals, an army and a nation.

# The Light Ahead

## Natick Soldiers, civilians remember 9/11

By Tazanyia Mouton, USAG-Natick Public Affairs / NATICK, Mass (Sept. 11, 2013)

*At exactly 8:46 a.m., the Soldiers and civilians of the Natick Soldier Systems Center took a moment to pause and remember 9/11.*

*Eleven bells tolled to honor the memory of all the patriots lost on that day.*

*This observance provided a chance to pray for those lost on that tragic day, their families, and also to reflect on where we have been and are going as a nation.*

Col. Collier Slade, military deputy commander, Natick Soldier Research, Development and Engineering Center, had a chance to reflect on this somber occasion.

“The events of September 11th, 2001, remain indelibly etched in our consciousness,” Slade said. “We can all recall where we were and what we were doing at this dark hour when nearly 3,000 of our fellow citizens, going about their daily activities, would die in four unprovoked attacks.”

The attacks on 9/11 shattered the normalcy of a beautiful, sunny morning and unleashed a chain of events that would affect Americans in ways that no one could have predicted.

“The hours, days and weeks that followed 9/11 were filled with disbelief, grief, anger and also a growing sense of determination; we would not be intimidated,” Slade said. “We were determined not to let the terrorists destroy our way of life, and we resolved to fight.

“Fight like the passengers on Flight 93 did when they prevented another attack on the

nation’s capital,” he said. “Fight like the first responders did as they clawed through rubble to find survivors.”

Slade went on to say the terrorists who wanted to destroy the U.S. unknowingly unleashed the nation’s strength, courage, compassion and willingness to fight.

Since Sept. 11, 2001, more than five-million American men and women have served their nation in uniform. Two million Americans have served in war zones since 2001, and of these, more than 6,000 service members have made the ultimate sacrifice to preserve the freedoms that define America.

“As we pause today to remember the life-changing events that unfolded 12-years ago, you should be inspired to know that your important work, your dedication to developing the world’s best Soldier systems, pays tribute to the sacrifice of the victims of 9/11, to our fallen service members, and to all those who are still in harm’s way,” Slade said. “May God bless those who lost their lives on September 11th and those who have given their lives in service to our country.”



One woman's personal connection with a fateful day

# Growing up after 9/11

By Alexandra Foran, NSRDEC Public Affairs

On September 11, 2001, the New York Fire Department's Ladder 12 Company was assigned to search the upper floors of the Marriott Hotel at the World Trade Center. While they were on the 18th floor, the first tower fell and all eight members of the company were knocked down.

Deciding to quickly head downstairs due to the severity of the collapse, leaving the bulk of their equipment behind, they reached the fourth and fifth floors and could go no further due to debris. That was when Lt. Philip Petti headed upstairs along with firefighter Angel Juarbe to recover their equipment – in the hopes that it would help them all escape.

As they ascended, they received several mayday calls from a member of Ladder 4. Petti answered his fellow

firefighter's call for help – staying in touch with him even as they climbed the stairs.

Petti also kept in touch with his company as they searched for a way out. Both Juarbe and Petti collected their tools and headed up until they could go no further, continuing their search for the hurt firefighter even as they descended the stairs.

Unbeknownst to Petti and his fellow firefighters in the Marriott Hotel, Ladder 4 was assigned to the tower that had just collapsed, so there was no way they would have ever found the injured firefighter.

The other members of Ladder 12 and a few civilians continued looking for a way out. When they found a possibility, firefighter Michael Mullen started to head back in order to show Petti and Juarbe the way.

Mullen was only 10 feet away from the opening when the second tower collapsed, killing hundreds including Philip Petti, Angel Juarbe, and Michael Mullen.

That same morning, I was in sixth grade in Michigan. I can still recall the ping of the TV when my

teacher quickly turned it off as we came back from lunch and the way she told us that our parents would have something to talk to us about that night.

In the evening, my brother and I were told that my uncle was at the WTC site but that he was probably fine. The following night, we were both sat down on our family room couch and told that my uncle — Lt. Philip Petti — was missing.

The shock of that news lingers with me still. I felt as if every part of my body were shutting down. My heart clenched tight and my head began to spin, I couldn't speak, my breath caught in my throat and I couldn't let it go. I violently tried to comprehend this news, but nothing made sense.

My world, as I knew it at 11, was shattered.

Our TV seemed to be on almost nonstop for months, the images glaring on the screen as everyone tried to make sense of a senseless act. My life was in constant flux for several months as we traveled from Michigan to New York regularly to be with our family in our original home.

We attended several ceremonies, a memorial Mass for my uncle in October, and, ultimately, a funeral in December when my uncle's body was discovered together with Juarbe's; Mullen's body was also found.

We met the Juarbe and Mullen families and grew close to them; they shared a sorrow with us only other 9/11 family members know. I never knew the entire story of my uncle's bravery until I was an adult, but even as a child I knew he was a hero, along with his fellow rescue workers.

I sometimes struggle with the fact that he'll be remembered for how he died, because I want people to also remember the full life he lived.

Uncle Phil was quick with a witty joke and laughed loudly and easily. He was the oldest of my mom's four siblings. He was what my grandma would occasionally call a "wise guy," but he had a big heart and family was extremely important to him.

A favorite memory of mine was the 40th birthday party we had for him following my brother's fifth birthday, which was carnival themed. Everyone in our family participated; there were ring toss and other games lined up around our backyard, with friends and families from the neighborhood joining in the festivities, too. It was one of those unforgettably good days when everyone had a great time.

That night when they brought out the homemade sheet cake for my uncle, with all of the candles aflame, my mom had convinced me to also bring a water sprayer as a joke. I remember how hard he laughed, how everyone all laughed, and then he pulled me over to help him blow out the candles.

Uncle Phil was definitely the best at giving big bear hugs – the kind that will almost crush you. He was humble and humorous, passionate about sports. He loved every aspect of being a firefighter, especially the camaraderie, the family that comes with being part of the FDNY.

Another time, when I was seven, I visited Uncle Phil's firehouse. We sat in the truck, and I learned about what it's like to be a firefighter: sliding down the pole, teaching kids fire safety, the sound of the alarm, pull-

ing all-nighters, and other nuances that I was in awe of. Later on, we sat at the table and enjoyed egg creams my Uncle Phil made as he also cooked dinner for his buddies gathered at the firehouse.

They reminded me of my own family, how we simply always loved being together. We sit or stand around my grandma's kitchen table — all 22 of us now — sharing stories and memories; we laugh out loud sometimes without being able to stop until tears start to well up in our eyes.

Those tears after 9/11, especially in the few years following, were sometimes sorrowful. Holidays were quieter than usual. That Christmas Eve a chair was missing, a plate was not filled, and the mood was more somber than joyful. The booming voice of my Uncle Phil and his laughter could only be heard in our minds as we recalled memories or looked at family videos and memorabilia.

When I think back 12 years ago to that fateful September, it's hard to believe I was just a child. In the immediate aftermath, I felt as if I were forced to grow up, see the world more broadly than the tiny scope it had once been: friends and family and the towns I grew up in.

Each year we do something to remember Uncle Phil and all those who were killed. Initially, I was too young to be able to go to the WTC site; for a few years, it was little more than a devastated hole in the center of New York, and so I stayed and watched the memorial with my grandparents.

Later on in middle school, I finally went to the site, and did most every year following. The first couple of years I attended the memorial, the WTC site was little more than a pit, and we would wait until after the names

were read until we walked down to the towers' footprints to place flowers in the pools of water created by pieces of wood.

I had the honor one year of reading the names of people who had perished as part of the memorial and was able to read my Uncle Phil's as well. I also had the honor the first year I went to the site to shake Mayor Rudy Giuliani's hand and thank him for coming to my uncle's service.

Each year my entire family, as well as many other victims' families, relives and remembers September 11 in their own way.

Even now, whenever I see a fire truck whirring past me or I go to the WTC site, I am always brought back to age 11. I lose myself for moments or minutes at a time, experiencing it all over again through the eyes of my child self. Even now, at 23, it still seems unreal.

Yet I am reminded of my uncle's and others' courage every day I go to work at the military base in Natick, where my uncle's prayer card hangs on my wall. At a young age, I had the utmost respect for our military service members and I understood their sacrifice on a very personal level.

My best days at work are when I have the opportunity to interview Soldiers who have risked their lives for the sake of others, for the sake of my own, and share their stories. Their sacrifice prevents another 9/11 from happening.

I will always remember 9/11, my Uncle Phil, and all the lives lost but never forgotten.





## White House official visits Natick

By Bob Reinert, USAG-Natick Public Affairs / NATICK, Mass. (Sept. 10, 2013)

Dr. Patricia Falcone, associate director for National Security and International Affairs at the White House Office of Science and Technology Policy, received orientation tours and addressed the workforce during a Sept. 4 visit to the Natick Soldier Research, Development and Engineering Center.

Falcone served on the Board of Army Science and Technology for the National Academies of Science from 2007 to 2009.

Falcone spoke to NSRDEC workers about "Science, Technology and Innovation for America's National Security," and she took questions from the audience. She also was given a number of briefings.

"Science and technology is a critical part of

our national security," Falcone said. "We are here now in the 21st century, and we have to make sure that we have the capacity to bring all kinds of technology and new innovation to these missions, and that involves, of course, both excellent S&T but a deep understanding of the operational context into which we're going to bring it."

Falcone said that the goal of those in science and technology is to get research and development funded at a rate of three percent of gross domestic product.

"We're not there right now. We're at about 2.7, 2.8 percent," said Falcone, noting that two-thirds of R&D funds come from industry. "It depends on the economy.

"We believe that even as the budgets are going down — in (the Department of Defense), in particular — that the science and technology should increase with inflation."

Falcone also stressed the importance of science, technology, engineering and mathematics programs and lauded Natick's STEM initiatives.

"It was just very clear you have a very deep and rich program and engagement with the community," Falcone said.

Falcone noted that President Obama believes that science and technology are crucial to the nation's future.

"You here at Natick are really a very key and important part of the national security (research and development) enterprise," said Falcone, "and we are so pleased that you come to work each day with so much enthusiasm and you've delivered so much impact to the Soldiers in the past and today and going forward."

**"If a commander has a small unit of 12 Soldiers with specialized skills and potentially two can get sick, that really impacts their mission. With this tool, he or she can think ahead to bring an extra person or allow for more time for Soldiers to acclimatize to the altitude. Essentially, it tells them the risk and also provides them with ways to mitigate that risk."**

Dr. Beth Beidleman, research physiologist, USARIEM



Dr. Beth Beidleman of USARIEM holds an Android-based smartphone to demonstrate the capability of the altitude-acclimatization model.

### Peak Performance *continued*

Researchers were also there to collect data to develop an altitude acclimatization model as part of the Altitude Readiness Management System, or ARMS, being developed. This system will contain three models: the validated AMS model, the altitude acclimatization model and a physical performance model.

"USARIEM has the world's largest mountain medicine database," said Dr. Beth Beidleman, a research physiologist for TMMD and the primary investigator for this study. "By using the wealth of historical data combined with the studies we have done at Pikes Peak, we have been able to pool information and create this important system."

Prior to this, there was no test that could predict an individual's likelihood of getting altitude sickness. So the researchers at TMMD came up with the idea to create a model that would significantly help planners and commanders when they are planning missions.

The ARMS combines population-based data with an individual's altitude exposure, providing useful information for sustaining health and improving performance. It does this by predicting the prevalence and severity of altitude stress by incorporating altitude acclimatization, acute mountain sickness and physical work performance decrements. Simply put, it predicts the level of AMS a person is likely to experience during a mission and

provides actual ways to reduce the severity and potentially avoid the affects of AMS altogether.

The first AMS model will allow commanders to identify the likely probability and severity of Soldiers experiencing AMS based on the mission requirements. If the risk and severity are too high, the altitude-acclimatization model will then enable commanders to mitigate the risk of AMS by developing an altitude-acclimatization prescription to avoid the harmful effects.

"This model allows commanders to mitigate the impact of altitude exposure," Beidleman said. "It not only predicts whether a Soldier would get ill at certain altitudes, it gives a prescription for exposure. This tool can prescribe, for example, that if (Soldiers spend) two days at 8,000 feet before they go to their final altitude of 14,000 feet, the likelihood and severity of AMS would be drastically reduced."

When this patent-pending technology debuts, the goal is to have produced a stand-alone software product coupled with the capability to produce a device version integrated into a wristwatch, GPS or smartphone.

"We are currently collaborating with Massachusetts Institute of Technology's Lincoln Laboratory to get this technology into a smartphone-based application," Beidleman said. "It is important for us to provide a really basic planning tool that anyone could easily use while planning missions."

Putting a good planning tool in the hands of commanders and unit leaders, enabling them to better complete their missions, is the primary planning consideration to Beidleman while perfecting this tool.

"If a commander has a small unit of 12 Soldiers with specialized skills and potentially two can get sick, that really impacts their mission," Beidleman said. "With this tool, he or she can think ahead to bring an extra person or allow for more time for Soldiers to acclimatize to the altitude. Essentially, it tells them the risk and also provides them with ways to mitigate that risk."



# NSSC This Week

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