

THE INNOVATOR

Optimizing Combat Casualty Care



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Vol. 9 No. 3

3rd Quarter 2021

Brig. Gen McQueen, New MRDC Commander Pays ISR a Visit



Col. (Dr.) Mark Stackle, USAISR Commander, center, welcomes Brig. Gen. Anthony McQueen to the Institute on Sept. 9. See more photos on page 3.

Brig. Gen. Anthony McQueen, Commanding General, U.S. Army Medical Research and Development Command and Fort Detrick, and Dr. Ana-Claire Meyer, MRDC Senior Research and Technology Advisor, paid a visit to the ISR Sept. 8 and received briefs and tours of the research facilities and Burn Center.

During the visit, McQueen and Meyer toured some of the combat casualty care research team labs including Blood Transfusion and Cellular Resuscitation; Engineering, Technology and Automation; and Organ Function Support.

They also received a brief and demonstration of the Lower Body Negative Pressure chamber and Compensatory Reserve Measurement algorithm and device by Dr. Victor Convertino, ISR Senior Scientist.

The day ended with a brief and tour of the Burn Center. McQueen and Meyer toured the Outpatient Burn Clinic, the Burn Intensive Care Unit, to include a brief of the Burn Flight Team, and the Progressive Care Unit.

This was the first visit to the ISR for McQueen since taking command of MRDC in June 2021.

CDR's Corner



Col. Mark E. Stackle, MD
Commander

"Optimizing Combat Casualty Care"

Team ISR,

As I review this issue of *The Innovator*, I continue to be impressed by the tremendous work performed by the entire ISR team. The work that each of you do every day in support of our research and patient care missions is simply exceptional. I was captivated by Dr. Galvan's article exploring the recent issue of the *Journal of Trauma and Acute Care Surgery*, which highlighted the top ten contributing authors in combat casualty care over the past twenty years. As the article outlined, nearly every one of those authors is a current or former member of the ISR team or has close ties with our organization. The work done by this group and many others translated directly into materiel innovations and knowledge products that were instrumental in achieving the highest survival rates in modern warfare in Iraq and Afghanistan.

While it is refreshing to see the ISR's recent impact on combat casualty care captured in one of the premiere medical journals, I know all of us recognize that the ISR's contributions to trauma and burn care extend well beyond the most recent two decades. It is well

known within the international burn care community that the ISR Burn Center's research efforts have yielded fundamental advances in the multi-disciplinary care of burn casualties since its founding in 1949. The year 1949 is significant in our history since it marks the year where the ISR Burn Center was established as the military's only burn center, and became only the second burn center established in the United States. To this day, the ISR Burn Center continues to be the only military burn center, and the ISR remains the only military medical research lab that incorporates both a direct patient care mission and a robust basic science research program.

While most people think that the legacy of the ISR started with its arrival in San Antonio in 1947, the ISR actually traces our lineage back to the Surgical Research Unit (SRU), which was founded at Halloran General Hospital on Staten Island, New York. The SRU's initial mission was to evaluate the role of the newly discovered antibiotic, penicillin, as a possible method to treat surgical wounds. With the outbreak of World War II, however, the SRU relocated to Fort Sam Houston to be co-located with Brooke Army Medical Center – a partnership that has brought enduring benefits to military medicine in garrison and on the battlefield.

The atomic detonations in Hiroshima and Nagasaki in 1945 generated thousands of burn casualties alerting the Army to the real threat of burn injuries in future wars. The critical need for improved therapy for burn patients was further amplified when the Soviet Union successfully tested their own nuclear bomb in 1949. Since that period in history, the ISR has remained dedicated to addressing this threat to our service members.

It is a true honor to be part of this esteemed organization that has done so much to advance the quality of health care delivered in the hospital and on the battlefield. While our research



mission has expanded to include all facets of combat casualty care, it is the commitment and professionalism of our staff that have remained a constant. Thanks for all that each of you do to support our organization and for the tremendously positive difference you are making for our future Warfighters and their families.

Col. Mark Stackle, MD
USAISR Commander

"Forge the Future"

THE INNOVATOR

Vol. 9 No. 3

Col. Mark E. Stackle, MD
Commander

Sgt. Maj. Larry D. White II
Senior Enlisted Leader

Steven Galvan, D.B.A.
Public Affairs Officer

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USAMRDC CG Visit to ISR



Brig. Gen. McQueen, center, discusses combat casualty care research initiatives with ISR leaders.



Col. Mark Stackle provides an overview of the ISR during Brig. Gen. McQueen's visit to the Institute on Sept. 8.



Brig. Gen. McQueen uses the Microsoft HoloLens while touring the Engineering, Technology and Automation combat casualty care research team area.



Dr. Jim Bynum, the science lead for the Blood and Shock Resuscitation combat casualty care research team, describes some of the current research being conducted by his team.



Dr. Lee Cancio explains the type of equipment the Burn Flight Team uses to transport patients to the Burn Center.



Bethany Martinez, chief nurse officer in charge of the Outpatient Burn Clinic, second from left, talks about her role in the Burn Center and the type of procedures performed in the clinic.

8 of 10 Top Contributing Authors to a Premier Scientific Journal are from USAISR



By Dr. Steven Galvan
USAISR Public Affairs Officer

Combat casualty care research at the U.S. Army Institute of Surgical Research (ISR) at Joint Base San Antonio-Fort Sam Houston, Texas, has been focused on saving the lives of Wounded Warriors since 1996. From hemostatic dressings to tourniquets and blood products to damage control resuscitation, ISR researchers' efforts have demonstrated a steadfast commit-

ment to advancing the care of combat wounded service members.

For more than two decades, some of ISR's most noteworthy contributions to combat casualty care research have been submitted and published in the Journal of Trauma and Acute Care Surgery (JTACS), a scientific journal dedicated to publishing the most important and impactful manuscripts related to combat casualty care. More recently, the journal has published an annual supplement dedicated specifi-

cally to combat casualty care in order to further highlight these types of scientific articles for clinical use. This year's JTACS Military Supplement, released in August, highlights the top ten contributing authors to combat casualty care manuscripts from 2001-2021; eight of which are current or former staff members at the ISR.

"This is the premier scientific journal for the discipline of trauma surgery," said Dr. Jeremy W. Cannon, SM, FACS, Professor of Trauma, Surgical Critical Care and Emergency Surgery at the University of Pennsylvania and one of three co-editors of the JTACS 2021 Military Supplement. "It has a broad scope in that it not only covers topics related to the surgical management of severe injuries but also the critical care management, as well as non-trauma surgical emergencies."

Cannon, a colonel in the Air Force Reserves, along with Navy Capt. (Dr.) Travis Polk, Director of Combat Casualty Research Program at the U.S. Army Medical Research and Development Command, and Col. (Dr.) Andre Cap, Director of Research at the ISR, were co-editors of the supplement.

"Eight of the top ten contributors to combat casualty care were ISR investigators," said Cap. "The other two were close collaborators of ISR investigators. I think it's fair to say that ISR as an institution is pre-eminent in the field of combat casualty care."

Cap also noted that Cannon performed the analysis on Web of Science and built the cover graphic highlighting the top ten contributors. Cannon's query identified a total of 1,768 manuscripts submitted and published in the JTACS, the majority coming from the ISR.

"The ISR has quite frankly been the driving force behind this dedicated supplement that grew out of the

8 of 10 Continues on Page 5

COL John B. Holcomb, MD Trauma Surgery	COL Lorne H. Blackbourne, MD Trauma Surgery	C. E. Wade, PhD Research	CAPT F. K. Butler, MD Ophthalmology, Tactical Combat Casualty Care	M. A. Dubick, PhD Research
	Victor A. Convertino, PhD Research			
Col Todd E. Rasmussen, MD Vascular Surgery	COL Lee C. Cancio, MD Burn Surgery	COL C. K. Murray, MD Infectious Disease	COL A. P. Cap, MD, PhD Hematology	

8 of 10 Continued from Page 4

historic ATACCC meeting [Advanced Technology Applications for Combat Casualty Care Conference now known as the Military Health System Research Symposium],” said Cannon. “The ISR continues to send some of their best scientific work to the journal for peer review and possible inclusion in the supplement every year, and without a doubt, these contributions have greatly bolstered the impact of this supplemental issue.”

Retired Army colonel Dr. John B. Holcomb, FACS, took command of the ISR in 2002 while the U.S. and its allies were involved in combat operations in Iraq and Afghanistan. Serving as both the ISR commander and the Surgeon General of the U.S. Army’s Trauma Consultant for his six years at the ISR, Holcomb deployed multiple times to the battlefield; experiences which, according to Holcomb himself, were vitally important in injecting a sense of urgency into the research laboratory culture.

“Bleeding to death was the primary cause of preventable death on the battlefield,” said Holcomb. “With the help of many, we were able to focus efforts on mitigating the primary cause of preventable death, deploying multiple

interventions that addressed all aspects of hemorrhage control.

“There was a well-articulated focus on publishing relevant papers focused on the current war effort across our entire command. This ensured that deployed providers at all levels of care would have the latest information and apply it to the casualties they were caring for, as well as preserving the thought process for future efforts in

combat casualty care.”

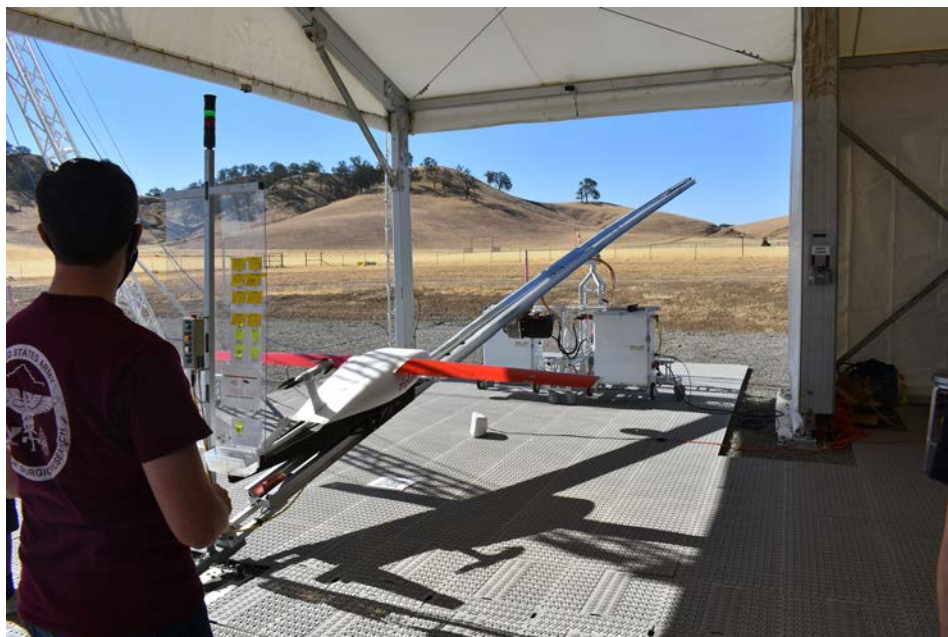
Before taking over as the ISR’s research director, Cap led the Coagulation and Blood Research team that focused research to develop products and approaches to resuscitate combat casualties. He believes the ISR provided – and still provides to this day – an environment in which motivated

8 of 10 Continues on Page 9



Dr. John Holcomb, MD, describes the ISR research efforts during his tenure (2002-2008) which included studies on tourniquets, combat gauze, resuscitation for burns and hemorrhage, blood products and the establishment of the Joint Trauma System, during the ISR’s 70th anniversary event in 2018.

Delivering Blood to Point of Injury on the Battlefield



Dr. Adam Meledeo is ready to launch a drone with blood products to evaluate any changes during air transport time.

By Dr. Steven Galvan
USAISR Public Affairs Officer

Research scientists at the U.S. Army Institute of Surgical Research (ISR) at Joint Base San Antonio-Fort Sam Houston, Texas, know that blood loss, or hemorrhage, is the leading cause of preventable death on the battlefield. To mitigate that problem, a team of scientists assigned to the ISR Blood and Shock Resuscitation Combat Casualty Care Research Team 1 (CRT1) are investigating a new method to get blood to combat wounded at the point of injury.

“We want to maximize patient survivability and return to duty, and so providing blood to the point of injury is one of the best things we can do,” said M. Adam Meledeo, Ph.D., an ISR research scientist. “We’ve known for a long time that providing blood as close to the point of injury as possible is critical for resuscitating the hemorrhaging patient, but supplies have always been limited because blood must be stored cold to maintain its function.”

The new method that Meledeo and members of CRT1 are exploring for

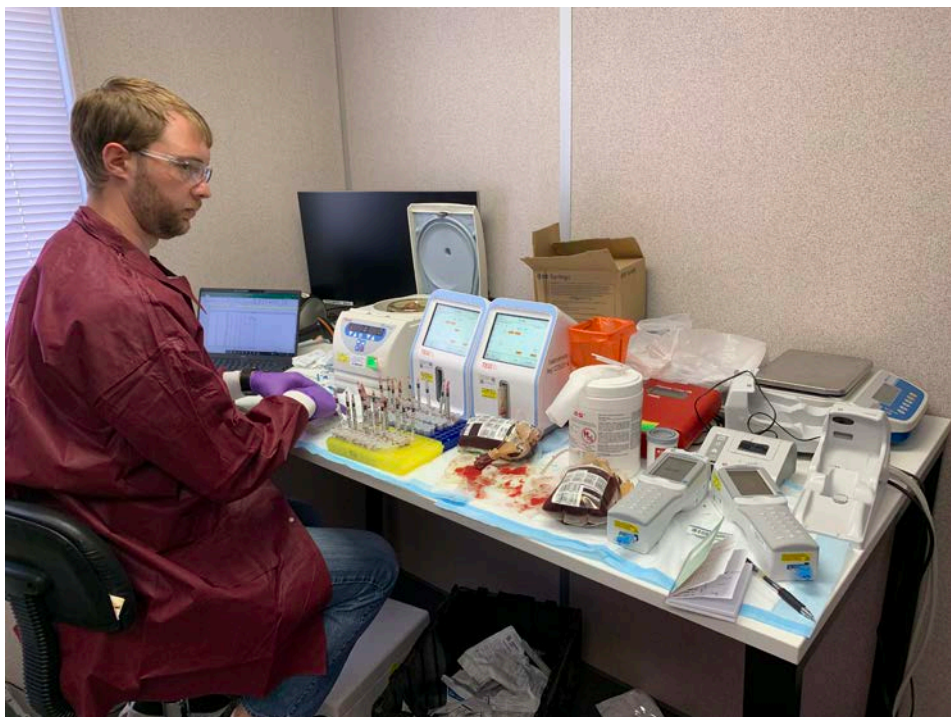
delivering blood and blood products to injured service members in austere and distant locations on the battlefield are unmanned drones. The ISR is collaborating with Zipline, a California-based company that operates the drones and is focused on delivering medical sup-

plies in areas with poor infrastructure. The ISR team saw firsthand how the drones are operated, and were also able to determine if any changes were made to the blood products being delivered.

“As part of our collaboration with Zipline, we were invited to visit their testing facility outside Esparto, California, to look at how the drone launching system, the flight, and the parachute dropping of the payload would affect blood’s function,” added Meledeo. “We brought a number of different blood testing devices with us and analyzed samples before and after flights for comparison to see if the blood was damaged in any way. All tests showed essentially no effect of using the drones to transport blood, which was a good sign for the technology.”

According to Meledeo, the use of drones for delivering medical supplies has been used before. Drones have been used to deliver medical supplies and biologics to rural areas across mountain ranges and in bad weather

Drones Continues on Page 8



Grantham Peltier tests blood products before and after a drone flight in a temporary lab at Travis Air Force Base in California.

Suicide Awareness and Prevention

The ISR held its 2nd Annual Suicide Prevention and Awareness Event on Sept. 10 with two subject matter experts on suicide awareness and prevention. Retired Army colonel, Dr. Thomas Hardaway II, M.D., the Medical Director for Child and Adolescent Mental Health Services at the Center for Health Care Services and Lisa Sullivan, Executive Director of the Texas Suicide Prevention Collaborative, both in San Antonio talked about suicide awareness and how everyone can better prevent suicide. Sgt. Ronald C. Smith, an Army Behavioral Health Specialist at the Burn Center coordinated the event that was streamed live on the ISR Facebook page.



Hardaway, a highly qualified and experienced child and adolescent Psychiatrist with 42 years of expertise in behavioral health, including 31 years in the Army describes some of the signs people with suicide thoughts experience.



Col. Mark Stackle, ISR Commander presents Hardaway with a coin of excellence after his presentation at the ISR Suicide Awareness and Prevention Event.



Lisa Sullivan who has created and executed a wide range of futures research and complicated strategy projects for Fortune 100 companies, industry associations, social impact organizations, research consortia, and state governments talks about the importance of suicide awareness and prevention.



Sgt. Maj. Larry White, ISR Senior Enlisted Leader presents Sullivan with a coin of excellence after her presentation at the ISR Suicide Awareness and Prevention Event.

Drones Continued from Page 6

in Uganda and Rwanda.

“The Marine Corps have used these drones in an exercise in Australia as well with great success,” Meledeo said. “The technology is ready, although advances continue to be made to accommodate specific military requirements.”

This technology could assist medics on the battlefield who can only carry one to two units of blood at a time. The drones being tested can deliver double that amount or more which could mean the difference between life and

death in some cases.

“Technologies such as this provide the capability to rapidly air drop blood or other critical supplies with a small, unmanned vehicle, to a tightly targeted location, supplementing the available supply and extending the time a casualty can be maintained before evacuation,” said Meledeo.

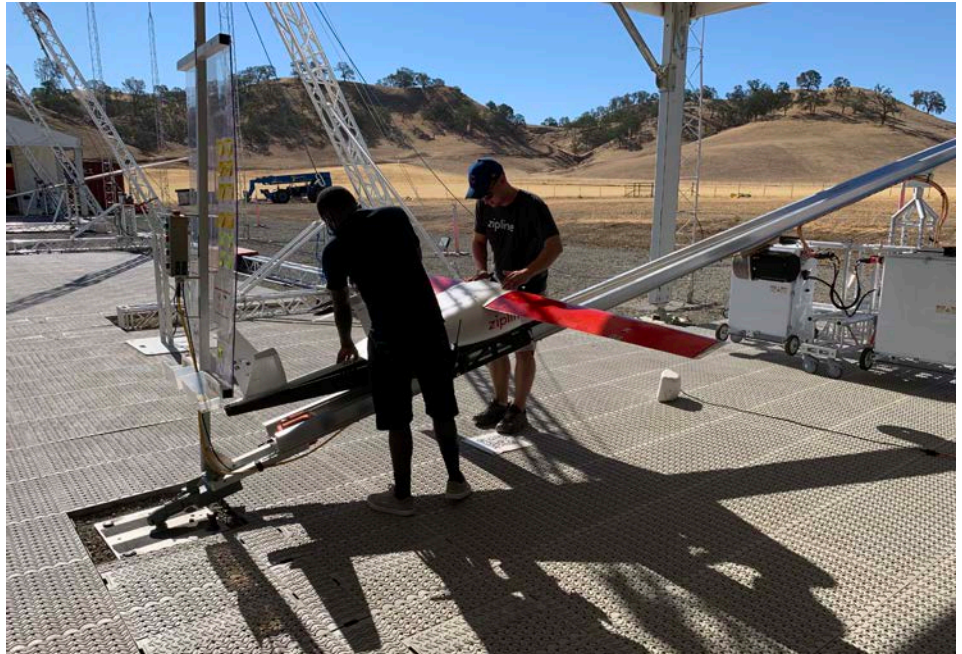
During the visit to California, Meledeo met with Congressman John Garamendi (CA-3) and his staff who were very interested with the work performed by the ISR team in further-

ing the ability to improve battlefield care of our service members. Meledeo stressed to the congressman and his staff that this effort was made possible by the combined efforts of the ISR, the Armed Services Blood Program, Armed Service Whole Blood Processing Lab (ASWBPL)-East, ASWBPL-West, and the 440th Medical Detachment Blood Support.

“I also stressed the need for research and technologies such as these to continue to be funded in support of combat wounded,” said Meledeo.

Right: Two staff members of Zipline, a California-based company that operates drones and is focused on delivering medical supplies, prepare a drone for flight to test and evaluate blood products delivered by drones.

Bottom: Blood products delivered by drones are parachuted to a specified location and can be delivered to austere locations.



Stop the Bleed Training

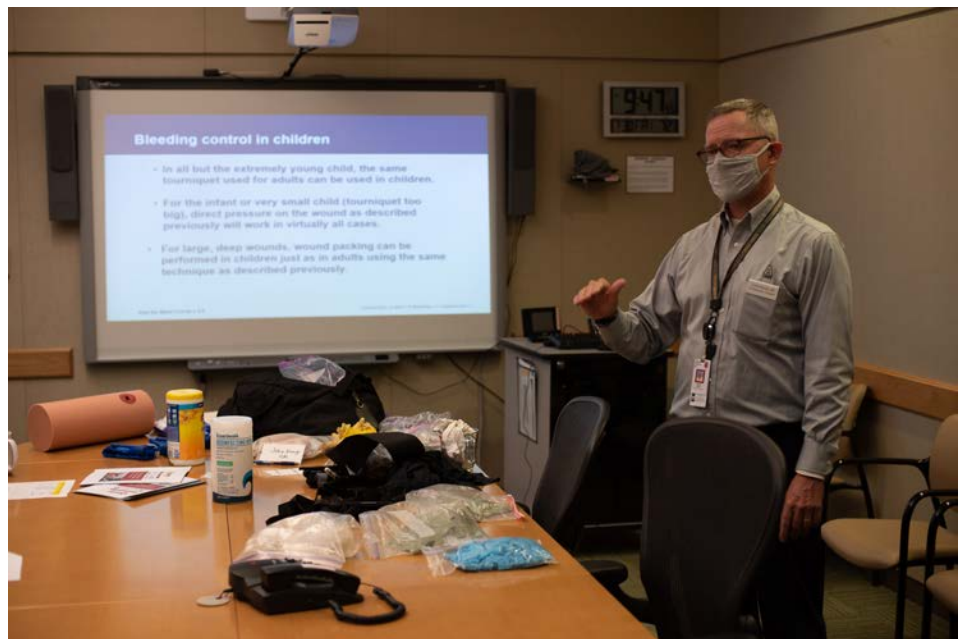
The ISR held a Stop the Bleed training session on July 29 by Dr. John Kragh, MD, an orthopaedic surgeon and scientist in hemorrhage control. According to the stopthebleed.org website, “the purpose of the training is to make our nation more resilient by better preparing the public to save lives if people nearby are severely bleeding.”

The Stop the Bleed training is also designed to raise awareness and teach people how to learn three quick actions to control serious bleeding.

Top right: Dr. John Kragh describes the three quick actions people can take to control serious bleeding before first responders arrive at an accident scene.

Bottom right: Participants of Stop the Bleed training do hands-on training on the proper use of tourniquets to control bleeding.

Photos by Staff Sgt. Bart Taylor



SAVE A LIFE

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researchers can flourish and advance the field of combat casualty care.

“This unique environment attracted researchers who wanted to be change agents and advance the field,” said Cap. “I was fortunate to lead an extremely

talented and hard-working team of scientists at ISR. I am extremely grateful for the opportunity to have taken part in this historic work.”

Cannon stated that the combat casualty care research at the ISR represents a vital link in the chain of survival for combat casualties.

Said Cannon, “Without the careful, thoughtful analysis of our results to identify capability gaps and then the innovations needed to fill those gaps, we would not be able to deliver the improvements in combat casualty prevention and care that are so vital to the supremacy of our fighting force.”

Safety Notes

By Stephanie L. Truss
Health, Safety and Environmental Manager



October is Fire Safety Month. Is your workplace or home fire proof? What do the sounds mean? Is there a beep or a chirp coming out of your smoke or carbon monoxide alarm? Knowing the difference can save you, your home and your family. Cooking and heating are the leading causes of home fires and fire injuries, and winter months are the peak time for fire-related deaths. Each year, the National Fire Protection Association (NFPA) celebrates National Fire Safety Month in October with October 3-9 being National Fire Prevention Week and the theme “Learn the Sounds of Fire Safety”.

Key messages for “Learn the Sounds of Fire Safety” include:

- When a smoke alarm or carbon monoxide (CO) alarm sounds, respond immediately by exiting the home as quickly as possible.
- If your alarm begins to chirp, it may mean that the batteries are running low and need to be replaced. If the alarm continues to chirp after the batteries are replaced, or the alarm is more than 10 years old, it is time to replace the alarm.
- Test all smoke and CO alarms monthly. Press the test button to make sure the alarm is working.
- If there is someone in your household who is deaf or hard of hearing, install bed shaker and strobe light alarms that will alert that person to fire.
- If there is someone in your household who is deaf or hard of hearing, install bed shaker and strobe light alarms that will alert that person to fire.
- Know the difference between the sound of a smoke alarm and a carbon monoxide alarm – three beeps for smoke alarms; four beeps for carbon monoxide alarms.

As a reminder to us all of the importance of fire safety awareness in both the workplace and our home lives. Fire safety awareness in the workplace should be second nature and should be translated into our personal lives to keep our loved ones safe in the event of a fire as well. Take time this month to have a fire safety talk with your department at work.

Health News

By Maria G. Dominguez, R.N.
COHN-S/CM
Occupational Health Nurse



Since the launching of the worldwide response to the COVID-19 pandemic, we have focused on learning about the disease—how it spreads and how it affects people and communities. We have focused our energy and resources on our healthcare workers, communities, and the public to protect themselves and save lives. We have focused on social distancing, quarantines and isolation. Now it's time to focus on you.

Are you ready to finish the last days of the year strong? Hot, humid weather can keep some people inside, instead of outdoors exercising. But cooler temps — even if they're slightly so — can help by encouraging both traditional fitness and Fall-themed outdoor activities, such as apple picking or pick-up football games. Here's a few tips on how to stay fit and healthy during the next few months as the weather changes:

- Active time in nature - even just five minutes - can benefit self-esteem and stress levels.
- Embrace the weather if you're not in the habit of regular physical activity, Fall's pleasant outdoor environment can make it a good time to start. Plus, you're going to create good habits for the holiday season and the upcoming winter months.
- Get enough vitamin D - this essential vitamin helps the body absorb calcium. When Fall arrives, daylight — one source of vitamin D - is less available. That's why it's important to either take a supplement or eat a varied diet in order to maintain appropriate vitamin D levels through Fall and Winter.
- Consume immunity-boosting foods. Eating healthy foods with vitamin C (like limes, oranges, and clementines) are key to fighting off infections. Garlic, ginger, spinach, and almonds are also big winners when it comes to boosting your health and immunity.
- Get your flu shot. Want to know how to stay healthy during flu season? Get the once-a-year flu vaccine. The vaccine can reduce flu illnesses, missed work and doctor's office visits.

College interns complete summer internship program at USAISR



Twelve college students from throughout the U.S. attended a virtual 10-week Summer Undergrad Research Program at the ISR with an optional on-site visit in July where the students were able to meet with their mentors, as well as tour the Burn Center, ISR research labs and the Center for the Intrepid.

By Dr. Steven Galvan
USAISR Public Affairs Officer

The U.S. Army Institute of Surgical Research (ISR) at Joint Base San Antonio-Fort Sam Houston, Texas, completed its annual 10-week Summer Undergrad Research Program (SURP) with 12 college students from throughout the nation. The summer program is sponsored by the Oak Ridge Institute for Science and Education (ORISE) and aims to expose college students to a laboratory environment and provide them with invaluable research experience.

This year's program was again held virtually (vSURP) due to restrictions related to the COVID-19 pandemic.

Nonetheless, as with the on-site program, the interns were paired with ISR researchers who served as mentors and oversaw their work on combat casualty care research projects.

"In the past, the focus of the program has been to provide hands-on experiences for the students by allowing them to participate in-person on research activities in selected laboratories here," said Carmen Hinojosa-Laborde, Ph.D., research physiologist and SURP co-director. "The objective of this year's program was to provide the students with the opportunity to participate virtually on research experiences. The focus of research experiences depended on the mentors involved. We have a wide range

of mentors who cover the majority of the Combat Casualty Research Teams (CRTs)."

In order for the program to succeed virtually, the mentors had to design projects that could be conducted remotely and all interns and ISR mentors agreed to work remotely during the summer. Anna Parry, a biochemistry student at Colorado State University, learned about the summer program through Handshake, a website CSU uses to help students find job opportunities.

"I applied because I was looking for a way to get my foot in the door in research," said Parry. "I did not have previous research experience, but I

SURP Continues on Page 16

Promotions/Reenlistments



Cpl. Jamie Wilson, right, presents Pfc. Kaylee Letoile with her Certificate of Promotion during her promotion ceremony on August 8.



Capt. Lauren Johnson, left, presents Staff Sgt. Eric Stewart with his Honorable Discharge certificate during his reenlistment ceremony on July 26.

Promotions

Staff Sgt. Ernest Branford

Lateral Promotions from Specialist to Corporal

Cpl. Illissa Blackshear

Cpl. Hannah Boshart

Cpl. Robbie Brockman Jr.

Cpl. Kristine Gentz

Cpl. Julie Hale

Cpl. Alice Henderson

Cpl. Ryan Lennon

Cpl. Joshua Little

Cpl. Daisy Poole

Cpl. Alvaro Rodriguez

Cpl. Tabitha Rodriguez

Cpl. Daikor Ruiz

Cpl. Anthony Szczesniak

Cpl. Cory Thornton

Cpl. Jamie Wilson

Reenlistments

Sgt. 1st Class Adam Henderson

Sgt. 1st Class Marvin Humphries

Sgt. 1st Class Dakota Wingerter

Staff Sgt. Inae Cho

Staff Sgt. Eric Stewart

Sgt. Harling Crespcruz

Sgt. Gerald Williams

Congratulations to the NCO of the Quarter and NCO/Soldier of the Month



NCO of the Quarter
Sgt. Jason Blum

July

NCO of the Month
Cpl. Alvaro Rodriguez

Soldier of the Month
Spc. Israel Zamorano



NCO of the Month
Sgt. Gerald Williams



Soldier of the Month
Spc. Yuliesia Tello

August



NCO of the Month
Cpl. Joshua Little



Soldier of the Month
Spc. Julie Harris

September

Around the ISR



Top left: Dr. Emily Boice, a research scientist in the Engineering, Technology and Automation combat casualty care research team explains how smart tourniquets could be deployed to the battlefield to Brig Gen. Clinton Murray, Commanding General, Brooke Army Medical Center during his visit to the ISR on Aug. 20.



Center left: Maj. Yoania Vazquez, chief nurse officer in charge of the Burn Center Progressive Care Unit, left, explains patient care to Brig. Gen. Paula Lodi, Deputy Commanding General (Support), U.S. Army Medical Command during her visit to the ISR on Sept. 21 as Staff Sgt. Andrea Dailey looks on.



Bottom right: Col. (Dr.) Andre Cap, Director of Research, left, presents Dr. Josh Wenke with a going away gift from the Research Directorate on August 13 during his going-away event.

On the Range

Sixteen ISR Soldiers were out at Camp Bullis' newly modified Assault Rifle Range shooting the updated Army M4 qualification tables on Sept. 23 with all 16 Soldiers qualifying.

Photos by Sgt. 1st Class Eric Jimenez



Poster Presentations - sgalvan@... Thank you - Zoom virtual Summer Undergrad Research Poster Presentation 2021

You are viewing Anna Parry's screen View Options

Anna K. Parry and Daniel N. Darlington
CTR1, United States Army Institute of Surgical Research, Fort Sam Houston, TX 78234,
Department of Surgery, University of Texas Health Science Center, San Antonio, TX 78229

The opinions or assertions contained herein are the private views of the author and are not to be considered as official or as reflecting the views of the Department of the Army or the Department of Defense.

Platelet aggregation and platelet function

Activated platelets

Non-activated platelets

Intracellular regulation of platelets

Introduction

When vascular trauma occurs, hemostasis is the body's method of stopping blood loss and preventing hemorrhage. Platelets are discoid blood cells that are vital to normal hemostasis. Platelet activation, adhesion, and aggregation help create a plug (clot) to stop bleeding. Common agonists that assist in these processes include adenosine diphosphate (ADP), thrombin, thromboxane A_2 , and collagen. Trauma and severe hemorrhage lead to platelet dysfunction. This platelet dysfunction is due to changes in platelet regulation on the intracellular level. In order to find treatment strategies for dysfunctional platelets after trauma, we performed a literature review in an attempt to map out all known intracellular pathways that control platelet function. In particular, we focused on protein kinase C (PKC), a major regulator of platelet activity. The PKC family is activated intracellularly by calcium and diacylglycerol (DAG) and impacts many processes important to proper platelet function such as platelet aggregation and spreading, thromboxane synthesis and secretion, and granule secretion.

Objectives

- Define the intracellular pathways in platelets that regulate PKC & map out known regulators of the pathway

Methods

We performed a literature search for agonists in the PKC pathway and how the PKC family affects platelet function. We reviewed the function of DAG and intracellular Ca^{2+} in relation to PKC. We then analyzed how each isoform of PKC regulated platelets.

Results

- Platelets are activated by... and collagen
- Receptors are PAR 1 (the IX-V (collagen)W/F), and
- G-proteins and Src family phosphatase C (PLC)
- PLC cleaves PIP_2 to create
- IP $_3$ and DAG
- IP $_3$ helps raise cytosolic Ca^{2+}
- DAG binds to PKC isoform
- Activated PKC isoforms regulate platelet function

Conclusions

Platelet activation entails shape change, dense granule secretion, thromboxane synthesis and secretion, and aggregation. It occurs after stimulation with thrombin, thromboxane, ADP, and collagen and activation of G-proteins, enzymes, and other molecules. Specific map follows the pathway that leads to PKC activation regulation of platelets. A potential treatment strategy includes drug action to stimulate PLC. PLC stimulates Ca^{2+} and ultimately assist in the activation of PKC to post regulate platelet activation. Furthermore, these still could be used in effective resuscitation strategy and battlefield trauma care.

Acknowledgements

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1) ORISE
2) And The US Army Medical Research and Development C...

Disclaimers

The opinions or assertions contained herein are the private views of the author and are not to be considered as official or as reflecting the views of the Department of the Army or the Department of Defense.

References

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Anna Parry, a biochemistry student at Colorado State University presents her poster on Zoom in early August to complete the 10-week Summer Undergrad Research Program at the ISR.

SURP Continued from Page 11

have always thought I wanted it to be a big part of my career. I was not expecting to get an internship after my first year in college, but I was interested in the projects ISR offered and wanted to pursue the opportunity.”

During the ten weeks of vSURP, Parry and her colleagues contributed to the writing of a scientific paper, participated in a weekly journal club, and attended a weekly seminar which summarized the research in a different ISR CRT each week. The journal club meetings and seminars were conducted via teleconference.

“The student-mentor communications for the individual writing projects were coordinated by the mentor, said Natasha Sosanya, Ph.D., staff scientist and SURP co-director. “We were able to offer an optional on-site visit in July where the students were able meet with their mentors, as well as tour the Burn Center, ISR research labs and the Center for the Intrepid.

The capstone event of the program came during the first week of August, when the students presented a poster discussing the findings of their research efforts.

“I was investigating platelet function, specifically, I mapped out an intracellular pathway that controlled platelet function,” Parry said. “My focus was protein kinase C. I spent a lot of time performing a literature review and then using that information to create my map. During my final poster presentation, I went over my map in detail and explained ways the information could be used for targeted drug action or resuscitation strategies.”

Parry also said that she truly enjoyed the program and working with her mentor.

“It was a great experience, and my mentor [Dan Darlington, Ph.D.] was fantastic,” added Parry. “His guidance made a huge difference for me. While it’s true I would have preferred to be physically in the lab, I am very glad I participated and got to interact with so

many people.”

Hinojosa-Laborde and Sosanya agreed that the summer program was a resounding success with the productive students producing great science.

“The ISR vSURP worked to provide undergraduate students completing degree programs in science, technology, engineering and mathematics [STEM] an experience of participating in scientific research with a unique military medicine prospective,” added Sosanya.

Said Hinojosa-Laborde, “The program provided a bridge between the classroom and real-world experiences and aimed to increase the number of future scientists to support the ISR mission.”

Parry said she would highly recommend anyone who is thinking about applying for the program to do so.

“Virtual or in-person, it is worth it,” she said. “Especially if they have the opportunity to work with Dan! It gave me a lot of insight into what I’m looking for in the future.”



Celebrating Science



In this section we endeavor to celebrate the dissemination of generalizable knowledge in the form of manuscripts, posters, presentations and abstracts. One of our core missions is translation of knowledge gained through pre-clinical and clinical experiments in an effort to optimize combat casualty care. It is important to acknowledge and recognize the collective work of our investigators during this process. Hence, we plan on “celebrating science” on a regular basis.

Manuscripts submitted for publication: 24

Submitted to:

Journal of Special Operations Medicine
Southern Region Burn Conference 2021
Current Opinions in Electrochemistry
The Medical Journal
European Burn Journal
Prehospital Emergency Care
British Journal of Clinical Pharmacology
Annals of Plastic Surgery
U.S. Army Medical Journal
Sensors Journal
Journal of Burn Care and Research
Military Medicine
Infection and Immunity
Dose-Response Journal
Annals of Biomedical Engineering

Abstracts: 36

To be presented at:

Southern Region Burn Conference 2021
Society of Critical Care Medicine 2021
Orthopaedic Research Society 2021
ASA Conference on Statistical Practice 2022
American Society of Hematology
Association of Military Surgeons of the United States 2022
San Antonio Postdoctoral Research Forum 2021
American Burn Association 2022
Texas A&M Pediatric Dentist Presentation
Shock Society Conference 2021

Posters: 32

To be presented at:

2021 Military Health System Research Symposium
Virtual Summer Undergraduate Research Program Presentation
Anesthesiology Conference 2021
American Association for Blood Bankers 2021

Presentations: 20

To be presented at:

USAISR Burn Symposium
2021 Military Health System Research Symposium
Body Sensors Network Conference 2021
University of Colorado Military Symposium
American Association of Blood Bankers 2021
Committee on Tactical Combat Casualty Care
Smith and Nephew Wound Treatment Meeting
Trauma Research Think Tank Meeting
Texas A&M Pediatric Dentist Presentation
Trauma Hemostasis & Oxygenation

Interviews: 1

Submitted to:

Tourniquet Conversion Webinar

Dissertations: 1

Submitted to:

Doctoral Dissertation at University of Texas

Letters to the Editor: 1

Submitted to:

Journal of Surgical Research

Career Counselor Shadows Burn Rehab Team

Sgt. 1st Class Jerry Furst
USAISR Career Counselor

As the Career Counselor for the U.S. Army Institute of Surgical Research, I serve as the honest broker for the Soldiers and act as the commander's eyes and ears in the unit. My existence is to keep the Army's forces strong through retention of America's sons and daughters, our Soldiers. My commanders and senior leaders will be assured that their Soldiers are afforded the most effective counseling available. In order to provide effective counseling, I must understand what our Soldiers do on a day-to-day basis. In August 2021, I took the opportunity to shadow the Burn Rehab Team. My day started with finding scrubs that fit and learning that they are not meant to carry a phone, wallet or set of keys. After a quick meeting with Sgt. 1st Class Blake Lansford, the Non-Commissioned Officer-in-Charge of Physical Therapy, I joined the team of Soldiers and civilians for their daily in-brief. Once complete, I got assigned to shadow Spc. Payton Perino, a Physical Therapy Specialist.

As I walked down the hall with Spc. Perino, he filled me in on how many patients he has and his responsibilities. Upon arriving to our first patient's room, I watched him as he interacted with his patient. It was obvious the patient was happy to see him and a bond had already formed between the two. The patient needed to perform mobility exercises to reestablish strength. I watched Spc. Perino assist with getting his patient to the exercise room and mounting on the exercise machine. After the workout was done, the patient was escorted back to the room, and Spc. Perino annotated the information into a system where others on the Rehab Team can review it.

Next, I was handed off to Sgt.



Sgt. 1st Class Jerry Furst, ISR's Career Counselor, second from left, with members of the Burn Rehab Team. Left to right: Staff Sgt. Inae Cho, Spc. Payton Perino, Sgt. Chad Geis, Sgt. Alfredo Ramirez and Sgt. Thomas Burlew. Furst shadowed some members of the Burn Rehab Team in August to understand what they go through on a daily basis.

Alfredo Ramirez where I shadowed him taking care of one of his patients. This was an eye opener, as it allowed me to see the range of severity the Rehab Team deals with. While many machines were making different beeps and tones, I watched him work alongside civilian nurses while other ISR Soldiers, including Staff Sgt. Charles Garcia, a Respiratory Therapist. As a team they all were taking notes and making adjustments to the patient's care as necessary.

When I thought I had a good idea of what our Rehab Team experiences on any given day, I was handed off to Staff Sgt. Inae Cho, an Occupational Therapy Specialist. I was quickly briefed that certain patients are not feeling their absolute best and therefore can be verbally abusive. As it was time to walk into her patient's room, I immediately knew why she briefed me,

and I was still was caught off guard. Nonetheless, she remained polite and kind. We were able to get her patient to the rehab gym where a therapy dog was present. Her patient's mood almost instantly changed when they saw the dog. The patient told stories about their dog and how they could not wait to see them again.

I spent my last hour sitting with the Soldiers on the Rehab Team in their office talking about the day and answering a few retention questions. The ISR Rehab Team are true professionals. The commitment to caring for their patients and encouraging them to participate and engage fully in their rehabilitation makes a difference in their long-term quality of life. The time I spent with the Burn Rehab Team opened my aperture wider than I could have anticipated. Thank you for the amazing experience!

Behavioral Health Specialist Beneficial for Some Burn Center Patients

Story and photo by Dr. Steven Galvan
USAISR Public Affairs Officer

The multidisciplinary burn team at U.S. Army Institute of Surgical Research (ISR) Burn Center at Joint Base San Antonio-Fort Sam Houston, Texas, cares for the sickest of the sick [high acuity] patients within the Department of Defense. And as the regional burn center in South Central Texas, they also care for high acuity civilian patients. Some patients with traumatic burn injuries or other life-altering sickness or diseases have a difficult time adjusting with the healing process or dealing with the rehabilitating progression to live with their new normal.

That's when Sgt. Ronald C. Smith, an Army Behavioral Health Specialist, reviews the records of every patient admitted to the Burn Center; an effort then followed by a behavioral health triage that includes an anxiety and depression screening.

"Under the supervision of an occupational therapist, we conduct initial interviews, triage, risk assessments, client assessments, mental status examinations, develop and implement treatment plans, group facilitation, collect and record psychosocial and physiological data, and other instruments that assess the client's potential or actual response to treatment and/or rehabilitation" said Smith. "Here at the ISR I find that we engage with patients who suffer from anxiety and depression the most."

Chuck Quick, an occupational therapist at the Burn Center, supervises Smith's clinical duties on a regular basis and says that the patient's assessment is critical to a treatment plan that optimizes the healing and recovery process.

"The information gathered is used to assess educational and therapeutic needs designed to support the holistic



Sgt. Ronald C. Smith, is one of two Army Behavioral Health Specialists at the Burn Center who are an integral part of the multidisciplinary burn team.

recovery from their trauma or illness, be it injury or infection," said Quick. "Following staffing of the clinical findings the behavioral health treatment plan is developed according to patient needs, goals and findings. Using a variety of engaging therapeutic interventions that informs the patient of the knowledge of clinical findings the behavioral health technician transitions the intervention from education to development of skills the patient can

practice and use to support improved mental health and enhanced physiological environment for recovery."

Quick also added that a high percentage of burn patients arrive with comorbidities of mental health diagnoses consisting of depression, anxiety and/or substance abuse disorders.

"Understanding that many patients suffer from anxiety and depression prior to the burn trauma itself establishes

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NCO Induction Ceremony



Twenty-one ISR Non-Commissioned Officers (NCOs) were inducted into the NCO Corps in a time-honored traditional ceremony on Aug. 13 at the Evan's Theater on Fort Sam Houston. The ceremony not only honored their achievement, but more importantly, served to convey the importance of the NCO leadership and the traditions that it holds sacred. Command Sgt. Maj. Trevor Walker, Army South, was the guest speaker and provided words of inspiration for the newly inducted NCOs.

Top: The ISR Color Guard led by Staff Sgt. Rachel Hammill, right, post the colors to commence the NCO Induction Ceremony.

Left: Staff Sgt. Charles Garcia lights the second or white candle signifying purity, honesty and integrity, the first is red for valor of the NCO, and third candle is blue for the field of honor.

Bottom: The ISR NCOs stand to prepare to cross into the NCO Corps during the NCO Induction Ceremony.



NCO Corps Inductees

Sgt. Devon Bates
Sgt. Stacey Bernetskie
Cpl. Robbie Brockman
Sgt. Ana Coba
Staff Sgt. Brandon Cordell
Sgt. Harling CrespoCruz
Sgt. Jennifer Crews
Staff Sgt. Stephen Freed
Sgt. Robert Garland
Sgt. Chad Gies
Cpl. Julie Hale
Sgt. Ryan Herrera
Sgt. Alyssa Jose
Cpl. Joshua Little
Sgt. Christopher Olverson
Sgt. Alfredo Ramirez
Sgt. Eric Ramirez
Cpl. Tabitha Rodriguez
Sgt. Jonathan Ruiz
Cpl. Anthony Szczensiak
Cpl. Jamie Wilson



Sgt. Stacey Bernetskie waits to be called into the NCO Corps during the NCO Induction Ceremony at the Evan's Theater on Fort Sam Houston.



The newly inducted NCOs pose with Sgt. Maj. Larry White, center, after the NCO Induction Ceremony on Aug. 13

In the Spotlight

Allison Ford

Job title: Progressive Care Unit Registered Nurse

How long have you worked at the ISR? One-and-a-half years.

What or who has been an inspiration to you in your work? The sense of teamwork on the floor and willingness of everyone to help.

What is your favorite part of your work? Seeing patients improve over time.

What is your proudest achievement? My daughter.

Short- and long-term goals: To continue learning every day.

Hobbies: Hiking.

Favorite book: *A Man Called Ove* by Fredrik Backman.

Favorite movie/TV show: Movie: *The Sandlot*.

Favorite quote: “I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.” – *Maya Angelou*



SMITH Continued from Page 19

a need to be well-versed in diagnosis specific interventions,” he said.

Smith said that as a behavioral health specialist he is able to intervene with Burn Center patients and help them build the skills needed to best push through the difficult phase in their lives.

“I have also found that we instruct our patients on prevention of what is called Acute Stress Disorder and PTSD [Post Traumatic Stress Disorder],” said Smith. “By teaching our patients how to identify acute stress disorder and how to reduce the symptoms they are more equipped to deal with it as it comes.”

Smith is one of two behavioral health specialists at the Burn Center and said that he chose this particular field because he loves to help people, especially when he sees their struggle with anxiety, depression or other psychological disorders.

“I love to see someone able to

reduce their anxiety and depressive symptoms themselves,” he said. “It may sound funny wording it that way, but as I see people apply the techniques and skills that I teach them, it is rewarding to see as they begin the road to recovery.”

Quick points out that behavioral health technicians like Smith are an essential part of the Burn Team as they are trained in addressing precipitating psychological experiences.

“Their expertise supports the functional recovery of our patient population by connecting their psycho-social findings with occupational therapy’s identified functional deficits,” said Quick. “This arrangement ensures the development of holistic interventions to remediate skills according to the underlying cause and reconnect patients to their identity and overall life purpose.”

Smith admits that working with burn patients is not always easy, especially those who don’t put effort into

their own recovery.

“One’s overall mental health and recovery therein, is all up to the individual,” said Smith. “For the skills that I teach someone to truly help a patient, they have to accept a need to change and want to make that change. This means changing thought patterns, or putting an effort for adjusting their sleep. Being able to help an individual learn the need for change is by far the hardest part even more so when the individual refuses to see the need.”

But that hasn’t discouraged Smith from putting his best effort into helping each patient he works with.

“I believe as we all work to improve ourselves, and when we try to better those around us, we all can learn things that will better our lives,” he added. “Emotions, feelings and what we care about are all things that we should never shun or ignore. Working in the Burn Center has taught me that a little bit of patience and persistence can go a long way.”