



THE INNOVATOR

OPTIMIZING COMBAT CASUALTY CARE



JUNE 2016

THE NEWSLETTER OF THE U.S. ARMY INSTITUTE OF SURGICAL RESEARCH

USAISR Staff Members Attend 48th Annual ABA Meeting

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Looking for Novel Treatment for Eye Injuries

CDR's Corner



Col. (Dr.) Michael D. Wirt
Commander, USAISR

"Optimizing Combat Casualty Care"

Greetings ISR,

It's hard to believe that in a few short weeks I will be departing for my next tour in Korea. While I look forward to my next assignment, I am also going to miss working with the Army's best team. It has been an absolute honor to work with a team that is truly committed to the organization's mission and vision. There's a reason why the ISR is a world-renowned institute—it's because of you and your dedication to teamwork. As I stated at the command brief during the last awards ceremony, the ISR is successful because the staff embraces the idea of "One Team."

I would like to share some of the information that I provided during the command brief for those of you who were not able to attend. Here's what you have done as "One Team" during my tenure. On the research side the total number of Journal Pubs: 309; five patents issued and there were four

invention disclosures submitted. The Burn Resuscitation Decision Support System-Clinical was FDA cleared for marketing and clinical use and approximately 10 percent of the burn units in the U.S. are using it. Also the number of research protocols managed is 272 with 128 CRADAs and seven research MOUs. The JTS had two MOUs and 12 MOUs for data sharing. These are remarkable numbers and it's teamwork that makes them possible.

The Burn Center team also had some significant numbers. Admissions were 1,555; 1,345 OR cases with 3,893 OR procedures; 6,466 outpatient clinic visits; 18,366 OT/PT visits; and the Burn Flight Team conducted nine missions to locations that include El Salvador, Peru, Singapore, Germany and Afghanistan. Truly amazing!

Here's another astonishing number: we had more than 600 college students apply for this summer's internship—a 750 percent increase from last summer. Also, the number of middle and high school students more than doubled this year for the GEMS program. At the Burn Center we had six burn fellows; 60 residents, 18 interns and 39

medical students who rotated through the Burn Center. All of this can only be accomplished through teamwork and dedication.

Your hard work and devotion to your work has not gone unnoticed. During the last couple of your you have been awarded back-to-back annual awards by the National Museum of Civil War Medicine; two team quarterly AMEDD Wolf Pack awards that subsequently led to the co-winners of the annual award. There were also countless of individual awards that were presented to staff members—too many to name them all. Like I said, the ISR team is a truly remarkable team because it's "One Team."

It has been a privilege to serve with the devoted and zealous professionals that make up the ISR Team. I look forward to hearing about your future successes and accomplishments that you will undoubtedly have because you will continue to work as a team.

Once again, thank you for all that you do every day at the ISR—your efforts are truly appreciated.

Hooah! Army Strong!



Col. Michael Wirt addresses the ISR staff during a command brief May 26.



ARMY MEDICINE
Serving To Heal...Honored To Serve

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SGM Says



Sergeant Major
James L. Devine

Greetings ISR

Congratulations to Spc. Isaiah Land for graduating from the Basic Leaders Course and making the Commandants List. Congratulations to Staff Sgts. Olarewaju Magreola and Daniel Zimmerman on their selection to attend the Air Assault Course at Fort Hood.

The Chief of Staff of the Army, Gen. Mark Milley has charged all Army leaders in maintaining his top priority which is readiness of the force. This is an all-encompassing readiness. I want to focus on three words that I have focused on as a leader; being relevant, genuine and real. NCOs are relevant in every mission and in every unit. When we are called to serve in Operational, Generating, or Institutional capacities, NCOs are agile leaders that need to continuously make their presence known and need not doubt their technical and tactical expertise and what our experience levels bring to the fight. We are in a period of transition in our Army where resilient, competent, confident leaders are needed now more than ever. Innovative thinkers need to be at the forefront, helping devise new ways to combat the next way to defeat the enemy. We are challenged to "Win in a Complex World," and to be ready to engage on multiple continents against an enemy that has or hasn't yet been identified. We as NCOs have a voice in how to fight the fight and we need to ensure that we



USAISR staff members were recognized at the command awards ceremony May 26 for their contributions to making the Organizational Day a success.

continue to demonstrate why we have always been deemed the "Backbone of the Army."

It is essential that leaders in the Army are genuine. Soldiers can spot disingenuous leaders within every organization. Genuine, Soldier centric leadership has become harder to find. I challenge all NCOs to be that genuine leader that Soldiers want to emulate. You cannot imitate being a genuine leader.

We are charged to professionally develop the next generation of Army leaders that will one day take our place to fight and win the Nations wars. It is our responsibility to set realistic expectations, counsel appropriately, and aid in developing their core leader attributes. Transparency is paramount. This is the only way that we as a corps can guarantee that we are going to sustain the competencies that we must possess as leaders; the abilities to lead, develop and achieve.

Army Strong!

On the Cover



USAISR staff members attended the 48th Annual American Burn Association Meeting in Las Vegas May 3-6. USAISR attendees presented 24 of the 37 abstracts and presentations, chaired two key sessions, moderated six oral and poster breakout sessions, presented eight invited talks, led four special interest groups, and led or participated in more than 10 committee and performance improvement meetings.

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Company Notes



Company Commander
Capt. Jose A. Juarez

First Sergeant and I would like to welcome the following Soldiers to the ISR family: Sgt. Matthew Anselmo, Sgt. Felipe Ortega, Sgt. Ralph Villa-Roman, Pfc. Josue Garcia-Marcano, Pfc. Sean Gay, and Pfc. LeKrystal Harris. Please welcome these folks into the ISR family, if you haven't already.

We would like to congratulate Spc. Isaiah Land for graduating from Basic Leaders Course at Fort Hood. He represented the ISR well with his hard work and dedication. Job Well Done!! Be sure to congratulate him when you see him around.

Congratulations to Pvt. Uzziel Pineda for his promotion to Pfc. for May 2016!! Please congratulate him when you see him. Great job and well done!!

We held our Soldier of the Month competition for May. And the winner was Spc. Isaiah Land! Please congratulate him on his victory! His photograph will be on display in the company area.

As spring is upon in full effect, be mindful of your surroundings and definitely keep an eye on the weather patterns during this time of year. This time of year is considered "hurricane season" for the State of Texas and being only 200 miles from the Gulf Coast could pose for some real threats from hurricanes. And as you all have been experiencing spring also brings with it much rain, which leads to flash flooding especially in the San Antonio

area which has a very high water table. With that being said please don't try and drive through water, regardless of how shallow it may be. "Turn Around, Don't Drown!"

Upcoming events: Holocaust Days of Remembrance Commemoration (FSH Theater, 1200). The month of May also brings us many other events throughout the month. June 5 is the start of Ramadan, which will run for 30 days through 5 July. June 10, Army's 241st Birthday, HOOAH!! June 14 is Flag Day. June 19 is FATHER'S DAY!! Consider this your reminder to get your Father, Grandfather, or Husband that gift he's been eyeing all year but just didn't want to spend his own money. 29 June is National Hug Day, so be sure and give your friends and family or even your 1SG a huge hug!!

Continue to challenge yourselves and each other every day, step outside of your comfort zones by seizing new opportunities and taking that leap.

Thank you all for everything you all do every day. It never gets old telling you all that it is truly an honor serving as your Commander and First Sergeant!
Army Strong!

TOBACCO FREE 

Starting June 1st, in accordance with Army Regulation 600-63 and Air Force Instruction 40-102, the use of all forms of tobacco are no longer allowed on the SAMMC campus. This includes cigarettes, cigars, pipes, smokeless tobacco, electronic cigarettes and vaping devices.



Soldier of the Month
Spc. Isaiah Land



Sgt. 1st Class Krendra Harralson, Staff Sgt. Stephen Raya, Staff Sgt. Pablo Sierra Staff and Sgt. Nakia Wilson were inducted into the Sergeant Audie Murphy Club May 12.

Around the Company

Top right: Command Sgt. Maj. David Rogers, MRMC CSM, third from right, presented ISR Soldiers with MRMC Command Coins May 5. Left to right: Staff Sgt. Pablo Sierra, Spc. David Watson, 1st Sgt. Natasha Tsantles, CSM Rogers, Staff Sgt. William Vidal, and Sgt. Varkaris Thompson. Right center: Staff Sgt. Pablo Sierra is presented the Sergeant Audie Murphy Club medallion during an induction ceremony at the Military Family Readiness Center auditorium May 12. Right bottom: Lt. Col. Ammon Brown, left, administers the "Oath of Reenlistment" to Sgt. Jacqueline Mason May 31 during her reenlistment ceremony. Center left: First Sgt. Natasha Tsantles was the guest speaker during the Sergeant Audie Murphy Club induction ceremony May 12.



USAISR staff members attend 48th Annual ABA Meeting

By Steven Galvan
USAISR Public Affairs Officer

Staff members of the U.S. Army Institute of Surgical Research played a major role at the 48th Annual Meeting of the American Burn Association in Las Vegas May 3-6. Of the 37 abstracts and presentations that were delivered during the meeting 24 were presented by USAISR attendees.

“This demonstrates the pivotal role of the USAISR in burn research,” said Lt. Col. (Dr.) Kevin Akers, USAISR Deputy Director of Research.

One of the podium presentations was presented by Spc. Alex Dixon of the Multi Organ Support Therapy Task Area.

“This is an unprecedented achievement,” said Akers. “To our knowledge, this is the first time in the history of the USAISR that an enlisted Soldier has delivered an oral presentation at a non-Department of Defense national scientific conference.”

Akers added that USAISR staff members also chaired two key sessions, moderated six oral and poster breakout sessions, presented eight invited talks, led four special interest groups, and led or participated in more than 10 committee and performance improvement meetings. USAISR personnel were also presented with some top awards during the meeting. Three manuscripts published in 2015 were among the best published papers that were selected by the editors of *Burns*, *Journal of Burn Care and Research*; *Journal of Trauma and Acute Care Surgery*; and *Wound Repair and Regeneration*. Four posters were selected for Best in Category and two posters were included in the Top 6 Abstracts plenary session.

Akers emphasized the importance of attending and participating in this type of meetings and said: “Without conference attendance, this tangible demonstration of research capability and dissemination of findings would not be as effective.”



Spc. Alex Dixon presents at the ABA annual meeting May 6.



Top row, left to right: Kristine Chafin, Debra Flores and Sahar Leazar. Bottom row: Patricia Colston, Linda Welker and Elsa Coates.

The best published papers of 2015:

Rose L.F., Wu J.C., Carlsson A.H., Tucker D.I., Leung K.P., Chan R.K.

“Recipient wound bed characteristics affect scarring and skin graft contraction”

Wound Repair Regen. 2015 Mar-Apr;23(2):287-96

Shelhamer M.C., Rowan M.P., Cancio L.C., Aden J.K., Rhie R.Y., Merrill G.A., Wolf S.E., Renz E.M., Chung K.K.

“Elevations in inflammatory cytokines are associated with poor outcomes in mechanically ventilated burn patients”

J Trauma Acute Care Surg. 2015. Sep;79(3):431-6.

Pidcoke H.F., Isbell C.L., Herzig M.C., Fedyk C.G., Schaffer B.S., Chung K.K., White C.E., Wolf S.E., Wade C.E., Cap A.P.

“Acute blood loss during burn and soft tissue excisions: An observational study of blood product resuscitation practices and focused review”

J Trauma Acute Care Surg. 2015 Jun;78(6 Suppl 1):S39-47.

Best in Category posters:

Serio-Melvin M.L., Caldwell N.W., Dilmar T.D., Leas M.L., Pamplin J.C., Mann-Salinas E.A.

“Assessment of alternative Insulin Infusion Protocols for Glycemic Management in Burn ICU Patients”

Rizzo J.A., Le T.D., Driscoll I.R., Graybill J.C., Chung K.K.

“Recurrent bacteremia in Combat-Related Burns”

Murray S.J., Phillips S.A., Rodriguez J.G., Serio-Melvin M.L., Aden J.K., Mann-Salinas E.A., Chung K.K., Nemeth C., Pamplin J.C.

“Achieving Ecological Validity: Creating Decision Support Tools for the Burn Intensive Care Unit”

Rose L.F., Fletcher J.L., Carlsson A.H., Hall C.L., Leung K.P., Chan R.K.

“Early Expression of PRSS-35 is Inversely Related to Skin Graft Thickness and Maximally Expressed in Grafts Placed on Fat”

Top 6 Abstracts:

Barba M.G., Valdez-Delgado K.K., Greeley H.L., Robbins J.R., Mann-Salinas E.A., Boyer S.

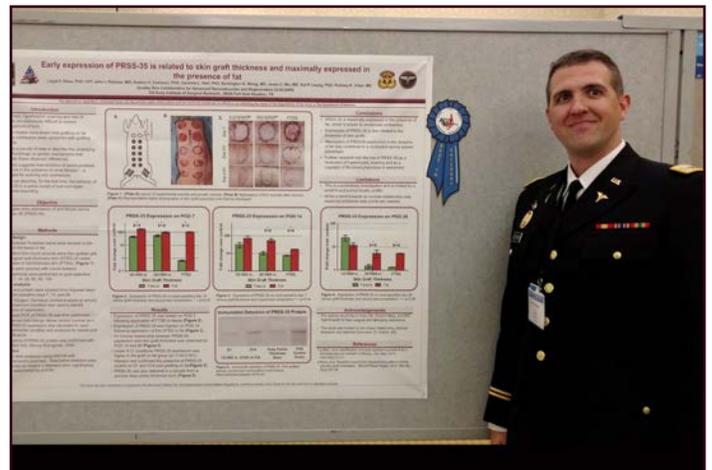
“Developing Nurse Competency and Clinical Reasoning: An Evidence-Based Toolkit for Preceptor Development”

Green C.M., Johnson D.W., Pamplin J.C., Chafin K.N., Murray C.K., Yun H.C.

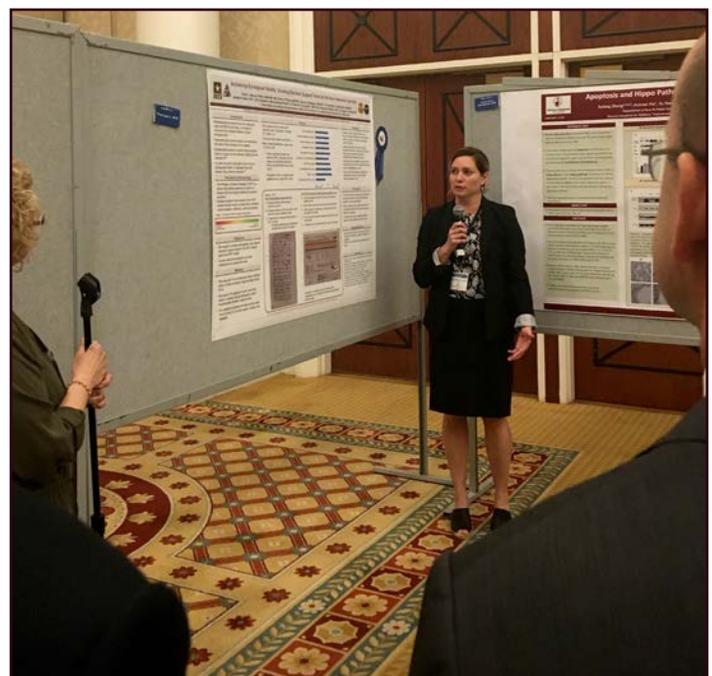
“Pulsed-Xenon UV Light Disinfection in a Burn Unit: Impact on Environmental Bioburden, Multidrug-Resistant Organism Acquisition and Healthcare Associated Infections”



Maria Serio-Melvin



Capt. (Dr.) John Fletcher



Sarah Murray

Safety Notes

By Stephanie L. Truss
Health, Safety and Environmental Specialist



June is National Safety Month as safety is everyone's business, I ask the you the USAISR/BHT Safety Team (Your Safety Manager and area Fire /Safety Monitors) as we join NSC and thousands of organizations across the country as we work to raise awareness of what it takes to stay Safe For Life. Observed annually in June, National Safety Month focuses on reducing leading causes of injury and death at work, on the roads and in our homes and communities.

Each week in June, the weekly safety tips that will be provided highlighting a different safety topic. I challenge you to start the day off in your workplaces covering the weekly topic and maybe sharing a personal lesson learned on this aspect. Not only with your immediate section, but with your area Fire/Safety Monitor and Safety manager. Some of the best feedback is through the opinions of the people who matter most: you the employees. By doing so, you will continue to promote an important aspect within the Voluntary Protection Plan (VPP) in contributing in a meaningful way. You may recall we've recently (late 2015) joined the ranks of now 30 MEDCOM Commands that have achieved the Army Safety Occupational Health Star Status with over 130 other units still attempting to reach that mark. Some have been working on it for more than three years. We are not done, the hard part is maintaining that momentum and continuing to strive for a healthy and safe work environment for all assigned

In the Spotlight

Christopher Bell

Job title: Surgery Manager

How long have you worked at the ISR? Almost 9 years

What or who has been an inspiration to you in your work? Knowing that what we do in surgery can have a favorable result for our Warfighters is motivating enough to come to work every day.



What is your favorite part of your work? The camaraderie that is developed between my co-workers, the researcher and their staff helps offset that fact that Trauma Research can be difficult to deal with considering the nature of it.

What is your proudest achievement? Came in 1st Place in my Fantasy Football League.

Short- and long-term goals: Anticipating the birth of my son in four months. Long-term goal: Attending my oldest son's graduation from Baylor in two years.

Hobbies: Golfing, playing softball, weightlifting, and watching MMA.

Favorite book: *How the Grinch Stole Christmas* by Dr. Seuss

Favorite movie/TV show: *A Few Good Men/Survivor* TV Series

Favorite quote: "When I go out there, I have no pity on my brother. I am out there to win." Joe Frazier

and those who visit.

All leaders and managers must ensure that risk management is an integral part of their work process from the planning to the daily interactions and must ensure that staff are properly trained to accomplish the mission. Bottom line up front: our goal and mission is to promote and foster a strong, safety culture. Every worker deserves to make it safely home from work - every day.

In a strong safety culture, everyone feels responsible for safety and pursues it on a daily basis; employees go beyond "the call of duty" to identify unsafe conditions and behaviors, and intervene to correct them. For instance, in a strong safety culture any worker would feel comfortable walking up to a member of leadership and or

management and reminding him or her to wear safety glasses. This type of behavior would not be viewed as forward or over-zealous but would be valued by the organization and rewarded. Likewise coworkers routinely look out for one another and point out unsafe behaviors to each other.

Fact on workplace injuries and deaths from the Bureau of Labor Statistics on April 21, 2016, finalized its data on worker fatalities for 2014, and the news isn't good. The U.S. workplace fatality rate increased for the first time since 2010, and the total number of on-the-job deaths was the highest since 2008. According to the BLS 2014 Census of Fatal Occupational Injuries, 4,821 people - more than 13 per day. Most of them - 1,984. Each one of these

SAFETY continues on page 16

Health News

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



Summer is a great time to take a vacation and have fun. It's also a great time to pay attention to your health and safety, build up your fitness program and enjoy fresh fruits and vegetables.

A summer favorite is ice cream and National Dairy Month is a great way to start the summer with nutrient-rich dairy foods. From calcium to potassium, dairy products like milk contain nine essential nutrients.

National Dairy Day was initially created to stabilize the dairy demand when production was at a surplus, but has now developed into an annual tradition that celebrates the contributions the dairy industry has made to the world. After the National Dairy Council stepped in to promote the cause, the name soon changed to "Dairy Month." Milk and milk products provide a wealth of nutrition benefits. But beware! Raw milk and milk products can harbor dangerous microorganisms that can pose serious health risks to you and your family. Raw milk from cows, sheep or goats that has not been pasteurized to kill harmful bacteria can carry dangerous bacteria such as Salmonella, E. coli and Listeria, which are responsible for causing numerous foodborne illnesses.

June is also National Fresh Fruit and Vegetables Month. Choosing fruits and vegetables that are in season is a great way to stretch food dollars. Cooking together is fun family time. Kids helping in the kitchen builds confidence and early skills of indepen-

dence, as well as a chance to measure, count, read and see food change. Plus, kitchen time offers a special parenting time.

To help us all with health promotion the U.S. Food and Drug Administration's (FDA's) new regulations requiring calorie information on restaurant menus and menu boards and on vending machines will be especially helpful for consumers. The FDA is currently developing guidance on menu labeling to facilitate compliance.

June brings Father's Day and June 13-19 is Men's Health Week! Encourage the men and boys in your life to make their health a priority. What steps can men take each day to improve health? Get good sleep, toss out the tobacco, move more, eat healthy, tame stress, and stay on top of your game. Men lead by example. Eat healthy, be physically active, get vaccinated, be smoke-free, prevent injuries, sleep well, and manage stress. Get checkups, and be seen for health problems before they become serious. Women take action! Your involvement is critical in improving the state of men's health. Women typically pay better attention to their health than men and can help men to adopt healthier habits.

Sexual health is just as important. National HIV Testing Day (NHTD) is June 27. NHTD is sponsored by the National Association of People with AIDS to encourage persons at risk to receive voluntary counseling and testing for human immunodeficiency virus (HIV).

Stay calm summer vacation is on the way! And there's an app for that. TravWell mobile app is here! The CDC's TravWell app helps you plan for safe and healthy international travel. Build a trip to get destination-specific vaccine recommendations, a checklist of what you need to do to prepare for travel and a customizable healthy travel packing list. The app also lets you

store travel documents, keep a record of your medications and immunizations and set reminders to get vaccine booster doses or take medicines while you're traveling. During-travel features available offline (no data connection needed). Emergency services phone numbers for every destination and it's easy and fun to use. Complementing this is the 2016 Yellow Book app.

The CDC Health Information for International Travel (commonly called the Yellow Book) is published every two years as a reference for those who advise international travelers about health risks. The Yellow Book is written primarily for health professionals, although others will find it useful.



The Yellow Book app is a definitive resource for healthcare providers and individuals seeking consultation in advance of international travel. Accessible content conveyed in easy-to-understand format, including maps, before you travel internationally, ensure that you are up to date on all your routine vaccines, as well as travel vaccines. As more and more Americans are travelling internationally each year, it is important to remember that some types of international travel, especially to developing countries and rural areas, have higher health risks. These risks depend on a number of things including: Where you are traveling, your activities while traveling, your current health status, and your vaccination history.

"It was June, and the world smelled of roses. The sunshine was like powdered gold over the grassy hillside." Maud Hart Lovelace, Betsy-Tacy and Tib. Happy summer!

Around the ISR

Top right: Michelle Tafoya cuts a birthday cake May 5.
Center right: Lt. Col. Thomas Rountree gives a brief of the Burn Center May 12 to government employees attending the Executive Leadership Program.
Bottom right: Sgt. 1st Class George Wallace gives a tour of the Rehab Unit at the Burn Center May 25 to nursing students attending The College of Health Care Professionals.
Bottom left: Kristine Chafin cuts a cake during a National Nurses Week celebration at the Burn Center May 9.
Center left: Col. (Dr.) Booker King provides some remarks May 9 during a National Nurses Week celebration at the Burn Center.



Around the ISR cont.

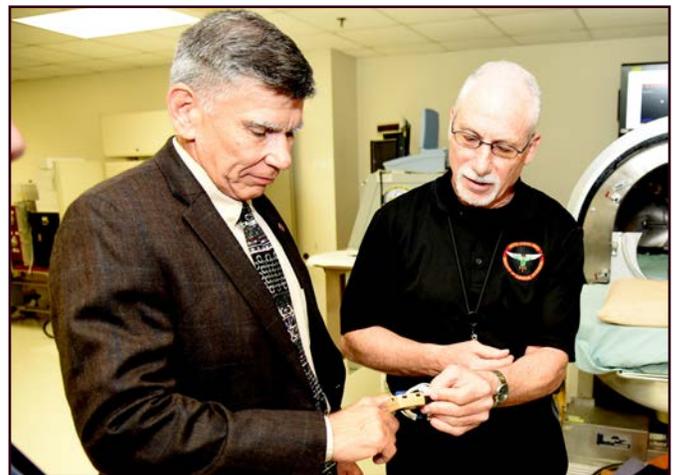


Center right: Maj.(P) Scott Phillips gives a tour of the Burn Intensive Care Unit at the Burn Center to Minister of State for Defense of Qatar, H.E. Dr. Khalid bin Mohammed Al-Attiyah May 17.

Bottom right: Victor "Vic" Convertino, right, demonstrates the functions of the Compensatory Reserve Index to the Chief of San Antonio's Office of Military Affairs, retired Maj. Gen. Juan Ayala, USMC.

Bottom left: Lt. Col. Thomas Rountree welcomes members of the Veteran's Administration Emerging Leaders Program to the Burn Center May 19 for a tour.

Top left: Staff Sgt. Gina Chang cuts her birthday cake May 20.



USAISR researchers looking for eye injury treatment



Capt. Elaine Por, a principle investigator and deputy task area manager in the Ocular Trauma Division at the USAISR is looking for a novel way to treat eye injuries that can result in blindness. Por is working with induced pluripotent stem cells, which have been differentiated into retinal pigmented epithelial cells to investigate proliferative vitreoretinopathy or PVR, a potentially blinding disorder that can result following a tear or detachment of the retina.

Story and photo by Steven Galvan
USAISR Public Affairs Officer

Researchers at the U.S. Army Institute of Surgical Research are looking for a novel way to treat eye injuries that can result in blindness. According to USAISR researchers, a non-invasive treatment could be available to Wounded Warriors with eye injuries within the next two to three years.

“We are currently investigating proliferative vitreoretinopathy or PVR, a potentially blinding disorder that can result following a tear or detachment of the retina,” said Capt. Elaine Por, a principle investigator and deputy task area manager in the Ocular Trauma Division at the USAISR.

Por stated that following a retinal tear or injury approximately 5 to 10 percent of the U.S. population develops PVR; however the occurrence of PVR is significantly higher in War-

fighters who sustain an ocular injury on the battlefield. Currently, the standard treatment of care for PVR involves surgery to the retina or posterior segment of the eye.

“Unfortunately, the success rate for

“I really love this project because we are attempting to find a promising therapeutic to treat a problem that is prevalent among our Wounded Warriors. Our in vitro, or cell-based research, is providing us with some promising data, but we are continuing to test different compounds and techniques to identify a therapeutic(s) for PVR that can be translated to the clinic.”

Capt. Elaine Por, Principle Investigator and Deputy Task Area Manager in the Ocular Trauma Division

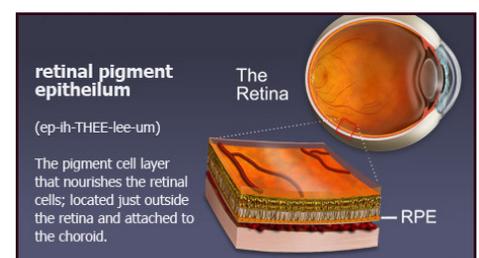
repairing a retinal tear or detachment through surgery is not great,” said Por. “It is an invasive treatment option that often leads to recurrent detachment of the retina and subsequently the need for additional surgeries.”

To search for a non-invasive treatment for PVR, researchers are actively working with induced pluripotent stem (iPS) cells, which have been differentiated into retinal pigmented epithelial (RPE) cells. Extensive literature suggests RPE cell activation as a major contributor to the pathology of PVR. Following a significant injury to the eye or head, a retinal tear can lead to the activation of RPE cells.

“When RPE cells become activated they demonstrate abnormal increases in cell migration, proliferation and contraction,” Por said. “These processes altogether are thought to be involved in the development and progression of PVR.”

Por has a recently accepted manuscript, scheduled to be released later this year in the Journal of Ocular Pharmacology and Therapeutics, which details her research and the data gathered thus far. She added that the laboratory research involves testing different drugs or compounds that can block the activation of RPE cells.

“I really love this project because we are attempting to find a promising therapeutic to treat a problem that is prevalent among our Wounded Warriors,” said Por. “Our in vitro, or cell-based research, is providing us with some promising data, but we are continuing to test different compounds and techniques to identify a therapeutic(s) for PVR that can be translated to the clinic.”



CELEBRATING SCIENCE



In this section we endeavor to celebrate the dissemination of generalizable knowledge in the form of published manuscripts. 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.

TOP THREE PAPERS OF THE MONTH

Resuscitation

Influences of Limited Resuscitation with Plasma or Plasma Protein Solutions on Hemostasis and Survival of Rabbits with Non-Compressible Hemorrhage

Kheirabadi BS, Miranda N, Terrazas IB, Voelker AN, Grimm RC, Dubick MA.

J Trauma Acute Care Surg

BACKGROUND: Plasma infusion with or without RBC is the current military standard of care for prehospital resuscitation of combat casualties. The authors examined possible advantages of early and limited resuscitation with fresh plasma compared with a single plasma protein or crystalloid solutions in an uncontrolled hemorrhage model in rabbits.

METHODS: Anesthetized spontaneously breathing rabbits were instrumented and subjected to a splenic uncontrolled hemorrhage. Rabbits in shock were resuscitated at 15 min with Plasma-Lyte, PAL+ fibrinogen, fresh rabbit plasma, or 25% albumin solution; all given in two bolus IV injections (15 min apart) to achieve a MAP of 65 mmHg. Animals were monitored for 2 hrs or until death and blood loss was measured. Blood samples and tissues were collected and analyzed.

RESULTS: There were no differences among groups in baseline measures and their initial bleeding volume at 15 min. At 60 min post-injury, MAP was higher with albumin than with crystalloids (PAL or PAL+F), but shock indices were not different despite the large differences in resuscitation volumes. Fibrinogen addition to PAL only increased clot strength. Plasma resuscitation increased survival rate (75%) without significant improvement in coagulation measures. Albumin administration replenished total plasma protein, and increased survival rate to 100%. No histological adverse events were identified in the vital organs.

CONCLUSION: Fibrinogen administration added to a compatible crystalloid did not improve hemostatic outcomes. Plasma resuscitation increased survival rate, how-

ever, its effects did not differ from those obtained with 25% albumin at 1/3 of the volume. The albumin advantage was consistent with our previous findings in which 5% albumin was used at a volume equal to plasma. The benefit of plasma for resuscitation may be mostly due to its albumin content rather than its coagulation proteins.

Bacteria detection technique

An optimized staining technique for the detection of Gram positive and Gram negative bacteria within tissue

Becerra SC, Roy DC, Sanchez CJ, Christy RJ, Burmeister DM

BMC Res Notes

BACKGROUND: Bacterial infections are a common clinical problem in both acute and chronic wounds. With growing concerns over antibiotic resistance, treatment of bacterial infections should only occur after positive diagnosis. Currently, diagnosis is delayed due to lengthy culturing methods which may also fail to identify the presence of bacteria. While newer costly bacterial identification methods are being explored, a simple and inexpensive diagnostic tool would aid in immediate and accurate treatments for bacterial infections. Histologically, hematoxylin and eosin (H&E) and Gram stains have been employed, but are far from optimal when analyzing tissue samples due to non-specific staining. The goal of the current study was to develop a modification of the Gram stain that enhances the contrast between bacteria and host tissue.

FINDINGS: A modified Gram stain was developed and tested as an alternative to Gram stain that improves the contrast between Gram positive bacteria, Gram negative bacteria and host tissue. Initially, clinically relevant strains of *Pseudomonas aeruginosa* and *Staphylococcus aureus* were visualized in vitro and in biopsies of infected, porcine burns using routine Gram stain, and immunohistochemis-

try techniques involving bacterial strain-specific fluorescent antibodies as validation tools. H&E and Gram stain of serial biopsy sections were then compared to a modification of the Gram stain incorporating a counterstain that highlights collagen found in tissue. The modified Gram stain clearly identified both Gram positive and Gram negative bacteria, and when compared to H&E or Gram stain alone provided excellent contrast between bacteria and non-viable burn eschar. Moreover, when applied to surgical biopsies from patients that underwent burn debridement this technique was able to clearly detect bacterial morphology within host tissue. CONCLUSIONS: We describe a modification of the Gram stain that provides improved contrast of Gram positive and Gram negative microorganisms within host tissue. The samples used in this study demonstrate that this staining technique has laboratory and clinical applicability. This modification only adds minutes to traditional Gram stain with reusable reagents, and results in a cost- and time-efficient technique for identifying bacteria in any clinical biopsy containing connective tissue.

JTS R2 registry

Evaluation of Role 2 (R2) Medical Resources in the Afghanistan Combat Theater: Initial Review of the Joint Trauma System R2 Registry.

Mann-Salinas EA, Le TD, Shackelford SA, Bailey JA, Stockinger ZT, Spott MA, Wirt MD, Rickard R, Lane IB, Hodgetts T, Cardin S, Remick KN, Gross KR.

J Trauma Acute Care Surg

BACKGROUND: A Role 2 registry (R2R) was developed in 2008 by the US Joint Trauma System (JTS). The purpose of this project was to undertake a preliminary review of

the R2R to understand combat trauma epidemiology and related interventions at these facilities to guide training and optimal utilization of forward surgical capability in the future.

METHODS: A retrospective review of available JTS R2R records; the registry is a convenience sample entered voluntarily by members of the R2 units. Patients were classified according to basic demographics, affiliation, region where treatment was provided, mechanism of injury (MOI), type of injury (TOI), time and method of transport from point of injury (POI) to R2 facility, interventions at R2, and survival. Analysis included trauma patients aged ≥ 18 years wounded in year 2008 to 2014, and treated in Afghanistan.

RESULTS: A total of 15,404 patients wounded and treated in R2 were included in the R2R from February 2008 to September 2014; 12,849 patients met inclusion criteria. The predominant patient affiliations included 4,676 (36.4%) US Forces, 4,549 (35.4%) Afghan Forces, and 2,178 (17.0%) Afghan civilians. Overall, battle injuries predominated (9,792; 76.2%). TOI included 7,665 (59.7%) penetrating, 4,026 (31.3%) blunt, and 633 (4.9%) other. Primary MOI included 5,320 (41.4%) explosion, 3,082 (24.0%) gunshot wounds, and 1,209 (9.4%) crash. Of 12,849 patients who arrived at R2, 167 were dead (1.3%); of 12,682 patients who were alive upon arrival, 342 died at R2 (2.7%).

CONCLUSIONS: This evaluation of the R2R describes the patient profile and common injuries treated at a sample of R2 facilities in Afghanistan. Ongoing and detailed analysis of R2R information may provide evidence-based guidance to military planners and medical leaders to best prepare teams and allocate R2 resources in future operations. Given the limitations of the dataset, conclusions must be interpreted in context of other available data and analyses, not in isolation.

CLINICAL RESEARCH

Blood

Specificity of Compensatory Reserve and Tissue Oxygenation as Early Predictors of Tolerance to Progressive Reductions in Central Blood Volume.

Howard JT, Janak JC, Hinojosa-Laborde C, Convertino VA.

Shock

Plasma

Dried plasma: state of the science and recent developments. Pusateri AE, Given MB, Schreiber MA, Spinella PC, Pati S, Kozar RA, Khan A, Dacorta JA, Kupferer KR, Prat N, Pidcoke HF, Macdonald VW, Malloy WW, Sailliol A, Cap AP.

Transfusion

Stem Cells

Challenges in translating mesenchymal stem cell therapies for trauma and critical care.

Herzig MC, Cap AP.

Transfusion

Blood

Whole blood for hemostatic resuscitation of major bleeding.

Spinella PC, Pidcoke HF, Strandenes G, Hervig T, Fisher A, Jenkins D, Yazer M, Stubbs J, Murdock A, Sailliol A, Ness PM, Cap AP

Transfusion



TOP PAPER OF THE MONTH

Bijan Kheirabadi, Ph.D., right, is presented with a Combat Casualty Care Research Program coin May 25 by Lt. Col. (Dr.) Kevin Chung, Director of Research, for earning the Top Paper of the Month.

Photo by Staff Sgt. Olarewaju Magreola

TRANSLATIONAL RESEARCH

Resuscitation

Plasma syndecan-1 and heparan sulfate correlate with microvascular glycocalyx Degradation in hemorrhaged rats after different resuscitation fluids.

Torres Filho IP, Torres L, Salgado C, Dubick MA.

Am J Physiol Heart Circ Physiol

Flap

C1 esterase inhibitor ameliorates ischemia reperfusion injury in a swine musculocutaneous flap model.

Fries CA, Villamaria CY, Spencer JR, Rasmussen TE, Davis MR.

Microsurgery

EXTRAMURAL COLLABORATION

AORTA/REBOA

The AAST Prospective Aortic Occlusion for Resuscitation in Trauma and Acute Care Surgery (AORTA) Registry: Data on contemporary utilization and outcomes of aortic occlusion and resuscitative balloon occlusion of the aorta (REBOA).

DuBose JJ, Scalea TM, Brenner M, Skiada D, Inaba K, Cannon J, Moore L, Holcomb J, Turay D, Arbabi CN, Kirkpatrick A, Xiao J, Skarupa D, Poulin N; AAST AORTA Study Group.

J Trauma Acute Care Surg

Blood

“Blood failure” time to view blood as an organ: how oxygen debt contributes to blood failure and its implications for remote damage control resuscitation.

Bjerkvig CK, Strandenes G, Eliassen HS, Spinella PC, Fosse TK, Cap AP, Ward KR.

Transfusion

Ophthalmic Disease

Acute and Chronic Ophthalmic Involvement in Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis - A Comprehensive Review and Guide to Therapy. II. Ophthalmic Disease.

Kohanim S, Palioura S, Saeed HN, Akpek EK, Amescua G, Basu S, Blomquist PH, Bouchard CS, Dart JK, Gai X, Gomes JA, Gregory DG, Iyer G, Jacobs DS, Johnson AJ, Kinoshita S, Mantagos IS, Mehta JS, Perez VL, Pflugfelder SC, Sangwan VS, Sippel KC, Sotozono C, Srinivasan B, Tan DT, Tandon R, Tseng SC, Ueta M, Chodosh J.

Ocul Surf

Pulmonary Embolism

Toward a More Robust Prediction of Pulmonary Embolism in Trauma Patients: A Risk Assessment Model Based on 38,000 Patients.

Black SR, Howard JT, Chin PC, Starr AJ.

J Orthop Trauma

Field Emergency

A proposed field emergency donor panel questionnaire and triage tool.

Doughty H, Thompson P, Cap AP, Spinella PC, Glassberg E, Skogrand Eliassen H, De Pasquale M, Strandenes G.

Transfusion

Back When...



Can you guess who this ISR staff member is? This photo was taken in 1982 when he was a sophomore at Beloit College.

Last Month's Answer:



Sgt. 1st Class Keith Lowe
Research Directorate NCOIC

Submit your photo for publication in upcoming issues.

Library News

By Gerri Trumbo
Library Manager



It is Sumer reading time, so this column will feature highlights on general library materials you may not know you can access or use as a member of the Army Library Community. The Self Service section of AKO (Army Knowledge Online) features a link to My Library. My Library is the public library (MWR) library in its electronic form. There are many useful and interesting sections to My Library. There are six tabs on the Home Page: Find a Book; Find My Library; Deployment Library Support; Read a Maga-

zine or Newspaper; Read or Listen to a Book; Practice Test ASVAB, CLEP or DSST. Each of these tabs is very comprehensive in themselves and should be explored according to your individual interests.

My Library is the portal for Zinio for Libraries. Zinio is a digital newsstand that allows you to read your favorite magazines on a variety of desktop and mobile apps. Magazines can be read online or downloaded to



be read offline at your convenience. Examples of the magazines on Zinio include Men's Health, US Magazine, Newsweek, Cosmopolitan, Brides, Car and Driver, Cycle World, Golf, Gun Digest, Harper's Bazaar, Health & Fitness, and many, many more. You use your AKO account information to create a Zinio account.

Also available is the database HeritageQuest Online where you can search your family history. There are City Directories, Mortality Schedules and U.S. Census Records to name a few. There is also a section to search selected records from the Revolutionary War.

At this time there are two main test prep sites available on My Library. One is Peterson's and the other is OASC (Online Academic Skills Course for Military Service). Last but not least, is the Safari Books Online that includes over 50,000 books, videos and tutorials. Safari Books Online can provide you with 24 hour access to its content with your registration.

It is a good time to make a decision to learn or rediscover a topic that has grabbed your interest at one or another. My Library on AKO can be the starting point for a summer filled with your choices on what to read.

SAFETY continued from page 8

deaths was 100 percent preventable. Again bottom line up front: our goal and mission is to promote and foster a strong safety culture. Every worker deserves to make it safely home from work - every day. Know I look forward to hearing about the conversations on the weekly topics and as a reminder this can count as safety training providing the topic and sign in rosters is turn in to the Area Fire/Safety Monitors and or the Safety Manager.

