USAMRDC USAISR

U.S. ARMY INSTITUTE OF SURGICAL RESEARCH

MISSION

To "Optimize Combat Casualty Care" by conducting,
(1) requirements-driven, programmatic research to develop knowledge and materiel products that drive evidence-based, best clinical practice solutions and deliver advanced technologies for the Warfighter; (2) providing state-of-the-art trauma, burn and critical care to DOD beneficiaries worldwide and civilians throughout the South Texas region; and (3) Burn Flight Teams.

BACKGROUND

The USAISR is a worldwide leader in combat casualty care, producing medical devices, biomedical research and novel therapeutics to treat Warfighters from the point of injury through the continuum of care. Serving as the DOD's only burn center since 1949, the Institute continues to provide superior care to Warfighters and their beneficiaries across the world by providing the full spectrum of care in state-of-the-art facilities led by highly specialized treatment teams. Fourteen core research competencies support comprehensive research designed to address the most important needs of the Army for treatment of combat trauma on the future battlefield. This includes new technologies for providing far forward personnel with tools to monitor, manage, and care for combat casualties across multi-domain operations.

In the early 2000's, the USAISR was the primary DOD laboratory for the development and testing of advanced hemostatic dressings (e.g. Combat Gauze), tourniquets (e.g. Combat Application Tourniquet "CAT") and other devices that are now carried by individual Service Members, medics, and civilian emergency personnel around the world. In the mid-2000's, the USAISR developed new devices to detect blood loss (the compensatory reserve index, "CRI" now known as the compensatory reserve measurement monitor or CRM) and to automate fluid treatments for burn patents (Burn Navigator). Today, the USAISR is the DoD's lead laboratory supporting the development of products such as freeze-dried plasma and cold-stored, extended-life platelets that will make transfusions possible wherever medically needed on the battlefield by reducing cold-chain and other logistical requirements. These products will also greatly benefit rural and remote civilian trauma care.

KEY THEMES AND MESSAGES

The Institute is the Army's premiere research organization focused exclusively on the combat wounded and is the home of the only Burn Center in the Department of Defense.

The medical and medical research activities performed at the USAISR are focused on saving lives on the battlefield, both for today and tomorrow.

The USAISR sustains the DOD's world-class adult Burn Center at Brooke Army Medical Center and leads the world in burn care research.

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In clinical trauma research, the Institute is examining a variety of combat casualty care problems in trauma/burn patients, including those described in other research areas, to improve treatment and reduce morbidity and mortality. The guiding strategy for the Institute's research program is to take the clinical problems identified on the battlefield into the research laboratory for further investigation and the development of solutions and then to validate those solutions in the clinical setting before they are returned to the battlefield as medical doctrine. The USAISR's vision is to be the world's premier research organization enabling readiness and delivering evidence based solutions for the optimal care of the combat wounded. The USAISR also is focused on sustaining the DOD's world-class adult burn center and leading the world in burn care research.

QUESTIONS & ANSWERS

How does USAISR combat casualty care research translate into improved trauma care?

The USAISR's comprehensive research programs address the DOD's most important requirements for medical advances to stabilize and treat combat casualties, to preserve life, limb, eye sight, and other critical functions for our wounded Warriors – on the future battlefield and today. The research at the Institute has been a driving force behind the most important advances in combat casualty care since 1949. USAISR research programs span the continuum of care from point of injury to return of duty/functional survival. Our research programs are requirements-driven and focused on closing capability gaps identified in several strategic-level documents.

What contributions is the USAISR focusing on prolonged field care?

The USAISR is DOD's lead laboratory for prolonged field care of combat casualties. We understand the new challenges for combat casualty care due to Multi-domain Operations (MDO). Within the MDO concept, routine, rapid patient evacuation will not be guaranteed due to contested airspace and the potential for interdiction of evacuation platforms. During these intermittent and unpredictable periods, personnel must be prepared to sustain casualties in an austere environment for up to 72 hours with organic capabilities and limited resupply. Prolonged Field Care (PFC) is the name for this type of care. The Research Directorate has three broad goals based on MDO and PFC concepts that guide on-going efforts to ensure the USAISR Combat Casualty Care Research is relevant to combatant commander requirements and aligned with current doctrine.

These goals are:

1. Increase capabilities of forward medical personnel with smart diagnostics, decision support, and robotic assist, as well as advanced drugs and other technologies. (Forward medical personnel can do more with less impact on the operational unit). Reduce the burden of combat casualty care on operational units.
2. Maintain survivability of casualties during prolonged care and evacuation.
3. Prevent wound progression (prevent relatively minor, survivable wounds from becoming life, limb, or eyesight threatening due to PFC conditions).The Institute is developing protective wound care treatments designed to prevent minor wounds from becoming life, limb, or eyesight threatening under prolonged field care conditions. Looking to the future, the USAISR is developing capabilities such as miniaturized extracorporeal life-support that will make it possible to provide care that has previously been available only in the hospital setting—for our troops in the field and during transport.

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What contributions has the USAISR Burn Center made to research and treatment?
The USAISR's Burn Center at Brooke Army Medical Center, Fort Sam Houston, Texas, serves as the sole burn center within the DOD; providing comprehensive care to military casualties, beneficiaries and civilian emergency patients based on state-of-the-science practices and technology fully integrated with combat casualty care research. The burn center has the resources required for providing optimal care to burn patients from time of injury through the rehabilitation phase. Critical care provided within the burn center leverages state-of-the-science best clinical practices coupled with clinical research to ensure optimal care. Ongoing research activities remain focused on combat casualty care and related priorities of the USAISR, including resuscitation, hemostasis and critical care of the trauma patient.

How has USAISR assisted in developing any inventions or products in the area of combat casualty care?
Our research has also led to the development of life-saving, combat casualty care products provided to the soldiers in the theater of operations including:

- Hemcon Dressing
- Combat Application Tourniquet
- Damage Control Resuscitation
- Combat Gauze Dressing
- Burn Navigator
- Hemostasis Innovations
- Hypothermia prevention kit
- Intraosseus Infusion Systems
- Resuscitation Innovations – Damage Control (Hemostatic *balanced* resuscitation/Freeze dried plasma/Cold Stored Platelets)
- Antibiotics administered by medic
- Burn resuscitation guidelines
- Needle thoracentesis
- Ultrasound to diagnose pneumothorax
- Individual/Vehicle First Aid Kit (IFAK/VFAK)
- Extracorporeal organ support (Renal replacement therapy/Lung support)
- Impedance threshold device for cardiac arrest and hypovolemia
- Device for early detection of shock (CRM)
- Battlefield burn prevention