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FOREWORD

This guide is a quick reference to the numerous specialized capabilities and collaborations involved in military medical research. This is a living document that will be updated as new collaborators are identified.

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Debra M. Niemeyer, Ph.D., DAF Chief Scientist
59 Medical Wing

“Warrior Medics – Mission Ready – Patient Focused”

MISSION: Optimize readiness and patient-centered care through collaborative health delivery, education, training and research.

Vision: Partners in a high-performance health system, dedicated to excellence in global care.

Goals:

- **Quality Healthcare.** The right care at the right place at the right time to build healthy resilient families and communities

- **Force Development.** Maximize the force through professional development, currency, training and deliberate mentoring to optimize health systems outcomes

- **Research.** Conduct translational research and apply knowledge gained to enhance performance, protect the force and advance medical care and capabilities across the global health system

- **Readiness.** Optimize health service support to meet global operational requirements.

San Antonio Military Health Systems (SAMHS)

*San Antonio Military Health System* a high performing system characterized by collaboration and innovation for mission success, to eliminate waste and unwanted variation.
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### Research Modernization Thrust Areas

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<th>Description</th>
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<tr>
<td>En Route Care</td>
<td>Continuum of care during transport of patients from point of injury to point of definitive care</td>
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<td>Expeditionary Medicine</td>
<td>Improving care during contingency ops; medical countermeasures against combat/operational stressors</td>
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<tr>
<td>Force Health Protection</td>
<td>Prevention of recognition injury/willness &amp; the early or detection of emerging threats</td>
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<tr>
<td>Human Performance</td>
<td>Enhancing performance of Airmen in challenging environments</td>
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<td>Operational Medicine In-Garrison Care</td>
<td>Providing definitive patient care/treatment in-garrison</td>
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<tr>
<td>Innovations</td>
<td>Identify, evaluate, and incubate novel concepts, new processes, or disruptive technologies</td>
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*Integrity - Service - Excellence*
FACT SHEET

59 MDW CHIEF SCIENTIST’S OFFICE

Science and Technology - Providing operational capability through Education, Training and Research

- Lead Air Force Clinical and Translational Research; capture and employ innovative technologies and approaches to sustain health/performance and revolutionize healthcare.

- Advance modernization efforts through focused research on Warfighter needs (e.g., Health Surveillance / Maintenance of BMTs).

- Drive high-level collaboration between Air Force, Department of Defense, Veterans Affairs and other government agencies, academia and industry to push translational (outcomes based) research and innovation.

- As Scientific Advisory Committee lead, ensure scientific excellence and military relevance. We conduct merit reviews and align research to address capability gaps, enable Graduate Medical Education, and support the broader education and training mission.

- Support the Operator; serves as Air Force Surgeon General’s liaison to the Air Force Chief Scientist in support of the Secretary of the Air Force, Chief of Staff of the Air Force and senior Science and Engineering community.

The mission of the 59 MDW is to optimize readiness and patient-centered care through collaborative health delivery, education, training and research:

- The 59th MDW Chief Scientist Office supports that mission by conducting translational research and applying knowledge gained to enhance performance, protect the force, and advance medical care and capabilities across the global health system.

Providing technical expertise to our investigators and staff in a wide variety of ways:

- Animal Research
- Biostatistics
- Budget Assistance
- Clinical Protocol Reviews
- Clinical Research Proposal Development
- Epidemiology Expertise
- Grant Application Development & Review
• Manuscript Preparation and Review
• Program Planning, Support and Review
• Research Requirements Build
• Technology Transfer Support

Clinical Research Areas of Interest:

• Advanced Technologies
• Austere Medicine (GME)
• Clinical and Rehabilitative Medicine
• Diabetes and Obesity
• Genomics, Proteomics, Metabolomics
  o Biomarkers (Diabetes, Other)
• Medical Modeling & Simulation
  o Virtual training / Virtual therapy
• Medical Toxicology
• Molecular Diagnostics
• Regenerative Medicine
• Stem Cell (autologous)
• Telehealth
• Trauma, Critical Care, En Route Care
• Vascular Injury
• Women’s Health
• And many more areas…
FACT SHEET

Audie L. Murphy Veteran Administration Center
at San Antonio, Texas

MISSION: To fulfill President Lincoln's promise “To care for him who shall have borne the battle, and for his widow, and his orphan” by serving and honoring the men and women who are America’s veterans.

Core Values:

- **Compassion**: We will treat all veterans and their families with the utmost dignity and compassion. We will provide services in a caring manner, with a sympathetic consciousness of others’ distress together with a desire to alleviate it
- **Commitment**: Veterans have earned our gratitude and respect. Their health care, benefits, and memorial service needs to drive our actions
- **Excellence**: We strive to exceed the expectations of veterans and their families. We strive to perform at the highest level of competence and take pride in our accomplishments
- **Professionalism**: Our success depends on maintaining a highly-skilled, diverse, and compassionate workforce. We foster a culture that values equal opportunity, innovation, and accountability
- **Integrity**: We recognize the importance of accurate information. We practice open, truthful, and timely communication with veterans, employees, and external stakeholders. By carefully listening and responding to their concerns, we seek continuous improvement in our programs and services
- **Accountability**: We will perform in a manner at all times that makes us accountable, responsible, and answerable to veterans and their families, our leaders and other employees as well as external stakeholders
- **Stewardship**: We will ensure responsible stewardship of the human, financial, and natural resources as well as data and information entrusted to us. We will improve performance through the use of innovative technologies, evidence-based medical practices, and sound business principles

Research Resources: The South Texas Veterans Health Care System (STVHCS) is a major resource for clinical and translational research in San Antonio. The STVHCS Research Programs include Clinical Sciences Research (single-site and multi-site cooperative studies), Biomedical Laboratory Research, Health Services Research, and Rehabilitation Research.

Research Initiatives: Currently there are approximately 250 active human protocols being conducted by approximately 100 investigators and 300 research staff in the STVHCS.
In Clinical Research there are Veteran Administration (VA) Cooperative Trials (prostate cancer, Human Immunodeficiency Virus (HIV), heart disease, diabetes, anticoagulation), VA-funded Clinical studies (diabetes, bipolar disease), Pharmaceutical industry studies (cancer, HIV, mood disorders, diabetes, heart disease, lung disease), and Investigational Drug studies.

In Biomedical Laboratory Research there are VA-funded studies and National Institute of Health (NIH)-funded studies. There are approximately 70 approved animal protocols being conducted within the STVHCS. In addition, there are 2 VA Research Centers (Neurodegeneration and HIV/AIDS) which were funded through 2011.

In Health Services Research there is a Research Enhancement Award Program with a number of VA-funded Investigators entitled the Veterans Evidence-based Research, Dissemination, and Implementation Center (VERDICT).

The Rehabilitation program operates a fully equipped gait analysis laboratory to investigate the effects of prosthesis design on amputee recovery and functional status.

The system dedicates 9,000 sq ft of space to the VERDICT, 35,000 sq ft of wet lab space, and 12,000 sq ft for animal research.

The Veterans Integrated Service Network runs a New Investigator Award program. Over 30 new investigator awards have been made to STVHCS researchers since 1998; of these young investigators 70% have been successful in gaining future VA or NIH support.
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Battlefield Health and Trauma Research Institute and
U.S. Army Institute of Surgical Research (USAISR)

MISSION: USAISR is one of six research laboratories within the U.S. Army Medical Research and Materiel Command (USAMRMC). The unit directs research to better understand and develop solutions for clinical problems identified on the battlefield and then validate the solutions before implementing them on the battlefield as medical doctrine. The unit also provides medical care for burn and trauma patients and training for medical professionals.

- USAISR is a highly decorated and celebrated unit. The institute has been involved in Humanitarian missions overseas that include the Union of Soviet Socialist Republics (USSR) in 1989, Guam in 1997, and Honduras in 1999
- The unit utilized its expertise by caring for burn casualties from every conflict since World War II to the present Operation Enduring Freedom
- The Army Superior Unit Award was awarded to USAISR for outstanding meritorious conduct in support of Operation Iraqi Freedom during the period of January 13, 2003 to December 31, 2004
- USAISR’s vision is to be the DoD’s premier combat casualty care research, burn, trauma, and critical care center in support of the medical needs of warfighters and their beneficiaries
- USAISR’s objective is to integrate all services’ combat casualty care research missions/functions into a multifaceted synergistic research capability with a clinical foundation
- USAISR also is focused on sustaining the DoD’s world-class adult burn center and leading the world in burn care research

History:

- **1943** - The Surgical Research Unit was established at Halloran General Hospital, Staten Island, New York
- **1947** - The institute became a permanent unit and moved to Brooke General Hospital, Brooke Army Medical Center (BAMC), Fort Sam Houston, Texas. The unit initially studied antibiotics for treating war wounds and expanded to study innovative new surgical techniques and developments
- **1949** - The unit’s mission was expanded to encompass the study of thermal injury. The advent of improved grafting procedures and continued use of antibiotics in new applications grew along with this mission
• **1950s** - The unit became a class II activity of the Surgeon General and later was assigned to Headquarters, U.S. Army Medical Research and Development Command. Research flourished, with the institute evaluating the use of plasma extenders, grafting and preservation of blood vessels, and the use of an “artificial kidney,” among other forward-thinking medical research initiatives. As the “Army’s Burn Unit,” this unit has served as a prototype and model for burn units all over the world. During this time, it was also a premier dialysis research center serving South Central Texas and neighboring states.

• **1994** - As part of the Army Medical Department reorganization, the institute became a subordinate command of United States Army Medical Research and USAMRMC. The institute became part of USAMRMC in March 1994 when the Army Medical Department reorganized and the U.S. Army Medical Research and Development Command were re-designated as USAMRMC. The research focus of the mission changed from thermal injury to the full spectrum of combat casualty care.

• **2003** - The USAISR Burn Center and BAMC’s Trauma and Critical Care Service were combined to form the DoD’s only Trauma Division under the direction of the Commander, USAISR.

• **2010** - The Battlefield Health and Trauma Research Institute (“BHT2”) collocates with USAISR (“BHT1”).

• **2011** – The new Battlefield Health and Trauma Research Institute officially opened in February. It houses the Navy Medical Research Unit-San Antonio, the 711th Human Performance Wing (711 HPW) Dental Evaluation and Consultation Service, and the Army Dental and Trauma Research Detachment. The Tri-Service BHT Center will leverage the synergy of clinical care and research to improve battlefield healthcare.

• **Current**: The Tri-Service BHT Center leverages the synergy of clinical care and research to improve battlefield healthcare.
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U.S. Army Institute of Surgical Research Burn Center

MISSION: The U.S. Army Institute of Surgical Research (USAISR) Burn Center serves as the sole burn center within the U.S. Department of Defense 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 been verified by The American Burn Association and the American College of Surgeons Committee on Trauma as having the resources required for providing optimal care to burn patients from time of injury through the rehabilitation phase.

Location and other Facilities: The Burn Center is located in the Brooke Army Medical Center at Fort Sam Houston, Texas. Comprehensive, multidisciplinary care is provided by Burn Center staff consisting of approximately 300 federal employees and contract staff, in concert with consultants from San Antonio Military Medical Center (SAMMC) facilities. The Burn Center staff is assigned to the USAISR, a subordinate command of the U.S. Army Medical Research and Materiel Command (USAMRMC) located at Fort Detrick, MD.

History: Since 2003, the Burn Center has admitted more than 800 combat casualties related to overseas contingency operations. 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, homeostasis, and critical care of the trauma patient.

- The Burn Center includes a 16-bed Burn Intensive Care Unit (BICU) providing care for patients with severe burns, inhalation injury, toxic epidermal necrolysis, necrotizing fasciitis, and other trauma for which the Burn Center team is optimally positioned to care for. Specialized support services include integral Continuous Renal Replacement Therapy. A dedicated respiratory therapy service consisting of 20 full-time therapists provides comprehensive pulmonary care, utilizing a variety of ventilators and modalities, including high-frequency percussive ventilation.
- A 24-bed progressive care ward provides either initial or extended care for patients admitted from the Emergency Department or clinic or in transfer from the BICU. The burn rehabilitation service consists of physical and occupational therapists and technicians, including staff with added credentials in hand therapy. Our physical medicine and rehabilitation physician works closely with rehabilitation staff to ensure maximal integration of services for all patients.
- The burn operating room team provides 24/7 staffing to ensure dedicated support for burn casualties for both acute and phased reconstructive operations. Three full-time anesthesiologists provide comprehensive anesthesia support in the operating room and throughout the Burn Center, including acute pain management. Our multi-specialty interdisciplinary team enjoys the active participation of our clinical dietician, psychiatric nurse specialist, social workers and nurse case managers, burn program manager,
attending surgeons, internists, physician assistants, fellows, residents, students, and multiple clinical research personnel who round collectively on all patients

**Research Strategy:** The clinical research program at the USAISR is to identify research areas on the battlefield. Following basic science bench research in our laboratories, solutions are rapidly dispatched for field testing. Solutions can be devices, medications, or changes in doctrine. Depending on the type of solution, the goal of improving patient outcome is met through retrospective studies, prospective cohort studies, or rigorous clinical trials. The benefits of these efforts reach both the warfighter and the civilian trauma population.

- For example, USAISR addressed the problem of extremity blood loss on the battlefield by finding the best device to solve the problem. We first developed the model to refine the question – What is the best device to decrease extremity blood loss on the battlefield
- Then we proceeded to determine which tourniquet was best for effect as well as utility. It was tested in the field and has become the standard in combat today
- Effective clinical research requires a team approach. Crucial members of the team are the clinicians, nurses, therapists, nutritionists in the burn and trauma units at Brooke Army Medical Center and the Army Burn Center. Documentation of their daily observations and interventions in caring for trauma patients is the foundation for research data collected
- All members of the staff have the capability of being designated principal investigators for research studies at Institute of Surgical Research. Clinical investigators are supported in their investigations by a team of Clinical Research Coordinators with extensive critical care and research experience
FACT SHEET

Center for Advanced Molecular Detection (CAMD)

Mission: The mission is to provide the capability of quickly identifying infectious agents in study subjects’ specimens, and the results may be used to support epidemiological investigations and public health surveillance. Medical personnel will use this information to recommend specific medical countermeasures and preventive medicine measures. The CAMD accomplishes this in several ways:

- Operational Real-World Test Bed for new technologies and techniques
- All work performed under six clinical protocols
- Collaboration with extramural sites
- Validation of new technologies
- Clinical Research staff integrated into trainee clinics and medical center
- Laboratory scientists perform real-time testing and provide results
- CAMD repository contains characterized research specimens for validation testing
- CAMD conducts research to drive improvements in clinical care for the warfighter and beneficiary

Goals:

- Evaluate assays for identification of pathogens of military significance
- Provide situational awareness via real-time testing & reporting
- Coordinate research activities with Department of Defense (DoD) laboratories and the Center for Disease Control and Prevention
- Support innovative Enroute Care-Combat Casualty Care, Military Operational Medicine (ECCC), Clinical Rehabilitative Medicine Research

Support for DoD Organizations:

- Marine Corps Recruit Depot (Parris Island)
  - ~250 environmental samples form gas masks, living quarters, personal lockers analyzed for Adenovirus and Influenza A- H1N1
  - Aided in reducing number of infections, helped establish more intense cleaning procedures in all areas
- San Antonio Uniformed Services Health Education Consortium Infectious Disease Fellowship Program
Collaborations with:

- Centers for Disease Control and Prevention
- Navy Health Research Center
- Madigan Army Medical Center
- Walter Reed Army Institute of Research
- 81st Medical Group Clinical Investigation Facility (CIF)
- 60th MDG CIF
- USAF Academy
- USAF School of Aerospace Medicine
- Department of Energy – Pacific Northwest National Laboratory
- Respiratory Pathogen Screening, Inc.

Summary:

- Only Air Force epidemiological research laboratory supporting surveillance testing laboratory in a real-world Test Bed with capability for novel research
- Test, evaluate and validate new clinical instrumentation and analytical procedures for transition to the field
- On-going monitoring for upper respiratory pathogens in Basic Military Trainees and other DoD populations
- Support DoD partners to identify disease causing agents of military significance, develop/validate new assays
FACT SHEET

Center for the Intrepid (CFI)

MISSION:  The CFI is a world-class physical rehabilitation facility focused on medical and rehabilitative care of wounded warriors and veterans, injured in service to America, many of whom have suffered limb-loss. Its premier facilities incorporate the best technology and techniques anywhere in the world and are beyond state-of-the-art.

Description:  The four-story, 60,000 square foot CFI includes clinical space, a military performance lab with a gait lab and computer assisted rehabilitation environment, a pool, an indoor running track, a two-story climbing wall and prosthetic center. The CFI will provide amputees and those with severe extremity injuries the best opportunity to regain their ability to live and work productively. In addition to serving as a premier rehabilitation center, the CFI is actively involved in clinical research.

Cost:  The $50-million CFI was built entirely from private funds generously donated by more than 600,000 Americans through the Intrepid Fallen Heroes fund.

Ongoing Fundraising:  Although sufficient funding has been received for the construction costs, the Intrepid Fallen Heroes Fund is accepting donations to provide additional services to the patients who will be treated in the CFI and their families. These services may include facilities for patients' children, additional medical equipment and supplies, medical research to improve the care of patients, and other areas. One hundred percent of the contributions will continue to go to these services, with nothing taken out for the Fund's administrative costs.

Eligibility:  Wounded warriors and veterans who were injured in the current Global War on Terrorism will be the initial beneficiaries of the facility. The CFI serves traumatic amputee patients, burn patients requiring advanced rehabilitation, and service members undergoing limb salvage techniques. Eligible patients are evaluated by a health care team to determine if they have the potential to benefit from the advanced rehabilitation offered, prior to being cared for at the CFI. Access to the facility will be based upon the space available to provide the care in a safe environment.

Reasons for Construction:  To date, more than 23,000 service members have been wounded in operations in Afghanistan and Iraq. Those who suffer injuries so severe that they require extensive medical care, years of treatment and rehabilitation, are medically discharged from the armed forces. Some are treated at San Antonio Military Medical Center, Walter Reed National Military Medical Center. Their future quality of life, their ability to care for themselves and
provide for their families, and their very survival depends on the treatment, rehabilitation and advanced training skills they receive following their injury.

Why the center was built with private funds: The Army currently provides superb medical and rehabilitative care for wounded warriors and will continue to do so. The Army is extremely grateful that a private, non-profit association is partnering with the Army and other Services to provide the best possible venue anywhere in the world for our wounded warriors. These wounded military members, injured in service to America, are top-notch athletes who deserve a facility that is the best in the world.

Medical Direction: The medical care carried out in the CFI is under the direction of the chairman of the Department of Orthopedics and Rehabilitation at Brooke Army Medical Center. Physiatrists work closely with the Orthopedic surgeons and other physicians to coordinate all care.

Military Performance Lab: The Military Performance Lab seeks to analyze human motion, with particular emphasis on amputee gait (walking). The information collected in the military performance lab is ultimately used to help physicians, physical therapists, and prosthetics’ adjust their treatment plans and improve patient function.

The Computer Assisted Rehabilitation Environment (CAREN): is a 21-foot dome with a 300-degree screen upon which a variety of “virtual realities” may be displayed. This simulator is the first of its kind and holds much promise for the rehabilitation of the patients. The CAREN is central to the research mission of the center.

Gait Lab:

- Up to 24 cameras use infrared light to track the position of reflective markers placed on a patient’s body. Joint angles are calculated and analyzed
- Force plates in the floor, parallel bars and treadmill measure ground reaction forces in three directions. Using these factors, the torque that muscles or prosthetic components are producing can be determined
- Electromyography (EMG) is used to assess the electrical activity that is given off during muscular contraction. The EMG system can detect both the timing and intensity of muscular contractions

Occupational Therapy (OT):

OT focuses on restoring health and function following injury or illness. Treatment activities are designed so that patients can successfully perform occupational tasks and Activities of Daily Living (ADL) like bathing, dressing, shopping, cooking, writing, performing household chores and everything needed to function on a day-to-day basis. Therapists and technicians provide:

- Evaluation and treatment for conditions including amputation, fracture, nerve injury and soft tissue injury
• Activities to regain range of motion, increase muscle strength, decrease pain, and facilitate their ability to perform functional tasks and to reach their maximum potential and independence

**Activities of Daily Living Apartment:**

The purpose of the ADL apartment is to provide patients a real-world environment in which to practice every-day skills. OT uses this apartment to evaluate and treat patients ensuring that patients are both physically and/or mentally capable of safely performing specific activities of daily living. The apartment has:

• A computer workstation equipped with state-of-the-art voice recognition software, compact keyboards and a height adjustable desktop
• A fully equipped kitchen and bathroom
• A comfortable living room

**Firearms Training Simulator (FATS):**

This state-of-the-art system simulates the firing of different weapons in a host of settings. Using the system, patients practice different firing techniques and may qualify with weapons systems common to the military.

**Community Re-integration:**

The OT staff also coordinates a community re-integration program for the amputee patients. This program includes a wide variety of experiences outside the clinic setting. Activities such as horseback riding, paint-ball, archery, kayaking and golf allow the patients to be challenged and have fun at the same time.

**Physical Therapy (PT):**

PT provides evaluation, diagnosis, treatment and rehabilitation for patients who have sustained trauma and/or illness. For the amputee patient, the PT team utilizes multiple interventions focusing on patients’ abilities and interests, not their disabilities.

• Amputation awareness and residual limb care while still an inpatient
• Wheelchair mobility and crutch training
• Strengthening activities
• Pre-prosthetic training working on dynamic balance, proprioception and endurance
• Residual limb care, fit awareness and gait training on a variety of surfaces
• An adaptive sports program including a multi-phased running program, swimming, snow skiing, water skiing, track and field, basketball, volleyball, fencing, archery, shooting, golf, kayaking and scuba diving
Specialized Equipment:

The third floor, there is a treadwall and a 21-foot climbing tower with auto-relay to promote strengthening, agility and aerobic conditioning.

In the natatorium there is a six-lane pool for pre-running activities, kayaking, water basketball and volleyball, and general swimming. The Flowrider®, a unique indoor activity adjacent to the pool, is used to improve balance, coordination, strength, motivation and confidence.

Case Management:

A full-time case manager is assigned to each patient in the CFI. These professionals work closely with the patients, their families and the entire staff of the CFI to:

- Coordinate the development of a customized, multidisciplinary team plan of care
- Monitor the plan of care to report any problems to the appropriate team member(s)
- Seek solutions to improve the delivery of care and patient outcomes
- Identify and assist with all needs of the patient and the family
- Function as the initial point of contact for multiple referrals utilized to augment care at SAMMC

Behavioral Medicine:

The ultimate goal for the CFI Behavioral Medicine Service is to enable patients to maximize their potential for emotional, mental, spiritual and physical recovery.

- Comprehensive psychiatric support services to amputees and their families from inpatient through convalescence and rehabilitation
- Individual therapy, support group meetings, medication management, family support group, and cognitive assessment
- Treatment facilitation for all behavioral health needs

Prosthetics:

The prosthesis’s and technicians in the CFI utilize a team approach to provide state-of-the-art onsite fabrication of artificial limbs. Standard production methods are augmented by:

- Computer assisted technology for design, milling, and production of prosthetic devices
- Wireless technology for remote adjustment of upper and lower extremity prostheses
- Design and fabrication of unique specialty limbs for sports and other activities
- High-tech materials in combinations of acrylic resins, carbon fiber composites and titanium
FACT SHEET

59 MDW Clinical Research Division (59 CRD)

The 59 CRD is the largest Clinical Investigations Facility (CIF) in the Air Force Medical Service (AFMS), providing centralized administrative, scientific, and regulatory oversight and guidance to the 59 MDW and over 18 outside Air Force sites in the development and performance of institutional and national biomedical research. The 59 CRD conducts more research and training than all other clinical research facilities in the AFMS combined. Available support includes protocol development, research design, biostatistics consultation, laboratory analysis, animal surgical services, and veterinary care. 59 CRD supports operational training requirements for Graduate Medical Education (GME) programs and Wing healthcare providers.

The 59 CRD supports many areas of research. The current primary research areas are:

- Vascular Research
- Medical Toxicology
- Emergency Medicine
- Regenerative Medicine
- Stem Cell Research
- Dental Post Graduate Research
- Nursing Research

The 59 CRD provides unique medical readiness training (75 Training classes, Approximately 1900 students trained in FY 12)

- General surgical skills training
- Extracorporeal Membrane Oxygenation (ECMO) training
- Pararescue training
- Emergency skills training
- Emergency War Surgery Course
- Airway and intubation training
- Oral Maxillofacial training

The 59 CRD is divided into three branches:
The Support Branch provides regulatory oversight/ensures regulatory compliance for all human and animal research conducted by the 59 MDW and over 24 outside AFMS Medical Treatment Facilities (MTFs). The Support Branch also assists investigators with protocol
development, approval of research, biostatistics, and dissemination of research findings. The support branch is the primary office for training and issues dealing with IRBNET, our new web based protocol management system.

- In FY 12, over 519 research studies conducted throughout the AFMS were managed by 59 CRD Protocol Office
  - 378 of the research protocols were human and human exempt research studies
  - 47 animal research and training protocols were conducted in FY 12
  - Residents served as Principal or Associate Investigator’s for the majority of these studies
- 59 CRD manages oversight of human and animal research through the Institutional Review Board (IRB) and Institutional Animal Care and Use Committee (IACUC)
  - 59 MDW IRB also serves as primary AFMS IRB for 30 outside AF MTFs

The Operations Branch provides comprehensive animal care, surgical support and animal pathology services:

- Three fully functioning operating suites, including microsurgical capability
- Three animal hyperbaric/hypobaric chambers for research topics such as altitude sickness, hyperbaric treatment of radiation injury, and wound healing
- Two Instron Materials Testers for various applications to determine fatigue, impact, and/or resistance of materials and tissues
- Radiology and imaging capabilities, including ultrasound, digital film, and fluoroscopy
- 25,000 square foot vivarium which houses up to seven species of animals
- Approximately 31,000 square feet of paddock area for up to 250 animals
- A fully equipped necropsy room (area for performing complete animal post-mortems)
- Animal histopathology laboratory for preparing slides of collected samples for examination by a veterinary pathologist including gross and microscopic pathology analyses of tissues, lesions, bones, teeth, and metal prostheses
- Divinci Robotic Surgery System – training program to certify surgeons to use the system in actual patient surgery
- Scanning Electron Microscope with 3D Dimensional capability

The Laboratory Branch provides human & animal laboratory support in five major areas:

- Chemistry – liquid chromatographic and mass spectrometric analysis of drugs and drug metabolites, hormones, enzyme inhibitors; identification of biomarkers for disease prediction and treatment monitoring
- Toxicology – state of the art Gas Chromatographic-Mass Spectrometric (GS-MS) and Liquid Chromatographic Triple Quadrupole Mass Spectrometric (LC/MS/MS) instruments for the identification and quantification of trace levels of drugs (e.g., amphetamines, ecstasy), drug metabolites, and other small molecular weight compounds
- Hematology – CBC, platelet, reticulocyte and differential, coagulation testing (clottable, chromogenic, and latex immunoassay), platelet function, and enzyme immunoassays
• **Molecular and Cell Biology** – real-time polymerase chain reaction (PCR) to analyze DNA and RNA for rapid field deployable diagnostics; four-color flow cytometry to quantify and measure specific cells, and cell cultures to determine proliferation and viability

• **Microbiology** – Aerobic, anaerobic, and low-shear modeled microgravity bacterial culture for epidemiology, disinfectant, proteomic, and medical readiness studies; sensitive real time PCR for the detection of bacterial and viral outbreaks

**59 CRD Director of Nursing Research:**

• A PhD-prepared nurse researcher is assigned to the CRD. She conducts human and animal research, presents research findings at military and civilian meetings, teaches research courses to nurses, guides nurses to develop research proposals, facilitates evidence-based practice projects, coordinates nursing support for provider and resident-initiated research, attends IRB and IACUC meetings as a voting member, and coordinates with the 59 MDW Chief, Nursing Research to represent the 59 MDW at Tri-Service Nursing Research Program (TSNRP) meetings, reviews grant proposals for the TSNRP, and advises 59 MDW leaders regarding nursing research
FACT SHEET

Diabetes Center of Excellence (DCOE)

MISSION: Promote excellent diabetes care and prevention across the Military Health System (MHS). The mission is three fold: Clinical Practice Excellence, Outreach and Training, and Research.

Vision: The DCOE will be the diabetes resource for Air Force Medical Operations Agency (AFMOA) disease management and prevention efforts.

Current State:

- Diabetes is a worsening epidemic confronting our medical system
- >47K AF Military Treatment Facility (MTF) enrollees have diabetes
- >108K AF dependent children are overweight/obese
- Data shows Air Force Medical Service (AFMS) performs below expectations on standard metrics
- Bulk of diabetes encounters are a primary care level
- Diabetes standards are complex and evolving, updated annually

Leadership of AFMS diabetes disease management efforts:

- Clinical Subject-Matter Expert executing AFMS strategic diabetes and childhood obesity care plans
- Standards of care policy guidance
- Partnership with AFMOA to align with disease management health promotion and clinical advocacy programs
- Development and maintenance of “how to” guides for MTFs

Consultative service:

- DCOE expertise available to MTFs for specific patient issues: direct referrals, t-cons, and e-mails
- Advocacy role: Community interventions and policy changes

DCOE training initiatives:

- Provider Continuing Medical Education (CME) course
- Nurses/Dietitians/Medical Techs shadowing opportunities
- Web-based tools
- Training opportunities at external MTFs
- Expanded GME opportunities
- Assist in Development of new curriculum at Uniformed Services University of the Health Sciences
Enroute Care Research Center (ECRC)

MISSION: Provide comprehensive, far forward research in order to enhance patient stabilization, preparation for movement, staging, and in-flight/in-transit care. End state is focused research conducted that will advance knowledge and treatment of injury and disease.

- ECRC Charter established Sept 2011, and first full-time director assigned Jul 2013
- The ECRC is part of the Air Force Combat Casualty Care Center with the Joint Battlefield Health and Trauma (BHT) Institute located at Ft. Sam Houston, TX
- The enroute care continuum encompasses a broad spectrum of transport environments including both rotary and fixed wing patient moves
- ECRC serves as the focal point for studying clinical knowledge gaps related to enroute continuum of care to include Medical Evacuation (MEDEVAC), Aeromedical Evacuation, Critical Care Air Transport Team (CCATT), and Burn Flight Team (BFT)
- All Enroute Care human and animal research protocols are managed through the oversight of the Institute of Surgical Research (ISR)/BHT and 59 CRD Institutional Review Board and Institutional Animal Care and Use Committee’s
- In Fiscal Years (FY) 2010 and 2011, 8 human research protocols, along with 3 animal research protocols were conducted and are currently ongoing. Areas of research: spinal fractures, blood transfusion, sepsis, acute coronary syndrome, burn, acute and chronic pain, traumatic brain injury, lifesaving interventions, hemorrhagic shock and compartment syndrome
- In FY 12 two studies were requested for full proposal to the Joint Program Committee 6, Combat Casualty Care program announcement. Those were, “Assessment of the Enroute Use of Parenteral Opioids, Parenteral Ketamine and Epidural Analgesia to Treat Pain in Awake Traumatically Injured Patients Transported by CCATT” and “Evaluation of the Restrictive Red Cell Transfusion Approach in Critically ill Traumatically Injured Patients and in Severely Burned Patients Transport by CCATT or the Army BFT”
- Additionally, four studies were requested for full proposal to the FY12 Air Force Medical Service program announcement, "Biomarkers for Resuscitation" “Operation Iraqi Freedom / Operation Enduring Freedom Psychiatric MEDEVACs” “Life Saving Intervention performed in Combat Setting” "Treatment of Rhabdomyolysis”.
- Additionally, Residents have provided support as Associate Investigator’s on several joint service research protocols
- Over 10 Papers and Posters presented annually at National and International Emergency Medicine Meetings
**Vision:** The vision of this charter is two-fold:

- Facilitate research and solution development for patient movement capability gaps from point of injury to point of final definitive care, that is, across the continuum of care
- Provide a solid foundation for the 59 MDW ECRC Concepts of Operations at the United States Army Institute of Surgical Research within the Joint Center of Excellence for Battlefield Health and Trauma
FACT SHEET

Extra-Corporeal Membrane Oxygenation (ECMO)

MISSION: To provide partial heart-lung bypass ECMO to eligible infants and children suffering from severe cardiopulmonary failure.

Background:

- ECMO utilizes modified heart-lung bypass equipment to provide temporary (days to weeks) heart and lung function during periods of severe cardiopulmonary failure
- Wilford Hall Ambulatory Surgical Center (WHASC) ECMO program started in 1985; 1st in Texas, 12th in nation. The ECMO center is now Located at the San Antonio Military Medical Center (SAMMC). It is the only ECMO center in Department of Defense
- Transport ECMO mission started in 1985 to address scarcity of ECMO resources
  - Currently 135 ECMO centers nationwide, clustered in metropolitan areas
  - Limited ECMO capability in Okinawa, and at most remote bases
- SAMMC remains the only long distance extra-institutional ECMO transport option in world
- An Adult ECMO Center was formally stood-up 2013, the only center in DoD

ECMO Patient Care:

- To date 188 patients treated, 77 ECMO transports
- Predicted survival without ECMO <20%, versus >70% with ECMO
- 1999-2009 averaged 4-5 ECMO patients/year
- Duration of ECMO therapy ranges from 3 to 44 days per patient
- Requests for transport on ECMO have increased over past 5 years
  - Receive 2-3 queries for every ECMO transport accepted
  - 41 transports 1999 through 2010
  - 14 of 41 transport cases were military dependents
  - Average distance per transport >1000 miles

Education and Training:

- Supports graduate medical education in surgery, obstetrics, pediatrics, and neonatology
- Provides training for 7 staff physicians, 5 neonatology fellows, 20 Neonatal Intensive Care Unit (ICU) nurses, 10 Pediatric ICU nurses, 10 respiratory therapists and 5 medical technicians at the maximal level of in-flight intensive care
- Essential element of training neonologists for remote, overseas assignments
Readiness:

- Quality family care allows fighters to focus on the fight: promotes long-term retention
  long-range transoceanic transport ECMO is a highly visible manifestation of the
  commitment “to take care of our own” - especially for families in overseas posts
- Transport ECMO team is a tool of national policy when implemented for humanitarian
  assistance
- Neonatal-Pediatric disaster response option, Department of Health and Human Services
  Federal Planning Region VI
- Hurricane Ike ECMO evacuation, 2008

Research:

- Tyree K, et al. Correlation of brain tissue oxygen tension with cerebral near infrared
  spectroscopy and mixed venous oxygen saturation during extracorporeal membrane
  oxygenation. Perfusion 2009
- Coppola CP, Tyree M, Larry K, DiGeronimo RJ. A 22-yr experience in global transport
- Wilson BJ, Heiman HS, Butler TJ, et al. 16-year neonatal/pediatric extracorporeal
  membrane oxygenation transport experience. Pediatrics Feb 2002
- DiGeronimo RJ, Henderson CL, Grubb PH. Referral and transport of ECMO patients. In:
  support in critical care, 3rd Ed. Ann Arbor: Extracorporeal Life Support Organization;
  2006. pp 157-72
- Readiness research on physiology of blood substitutes (York, J Peds Surg 2002,
**FACT SHEET**

**Adult Extracorporeal Life Support (ECLS) Program**

**MISSION:** To provide comprehensive ECLS support to eligible adult patients including combat casualties with respiratory, cardiopulmonary, and multi-organ failure and to serve as the hub of Department of Defense (DoD) Adult ECLS care and research.

**Background:**

- ECLS utilizes modified heart-lung bypass equipment to provide temporary (days to weeks) heart and lung function during periods of severe cardiopulmonary failure
- The San Antonio Military Medical Center (SAMMC) Adult ECLS program received pilot funding to explore the need for this level of care for adult patients and combat casualties in 2010
- Since April 2011, candidate patients referred to the SAMMC Adult ECLS program have been prospectively tracked as part of an Institutional Review Board approved data collection protocol
  - In 10 months, the SAMMC Adult ECLS program received 17 patient referrals
  - 10 patients were enrolled for data collection and long-term outcomes evaluation
  - In addition, 2 patients (1 civilian and 1 military) were referred for potential transport
  - Based on this volume of candidate patients, the SAMMC Adult ECLS program will open to in-house Adult ECLS support in the near future
  - Roll-out of a long-range transport team will begin soon thereafter
  - Sustainment requires a clear path for designee care

**SAMMC Adult ECLS Program:**

- To date 17 patients referred, average 2 per month
- Consent for data tracking and long-term follow-up obtained in 10
- Referring Intensive Care Units (ICUs) include the Burn ICU, the Medical ICU, Surgical ICU, and Trauma ICU
- Of the 17 referrals, 2 have been requests for transport
  - Medical Director, Nurse Program Manager in place
  - ECLS physicians, Nurse ECLS specialists trained
  - Credentialing and certification in process
  - Equipment and supplies purchased
  - Standard Operating Procedures developed and hospital-wide policy in review
Long-term vision is for SAMMC to be the DoD’s Adult ECLS clinical and research hub:

- Provide Subject Matter Expert and transport support to the Landstuhl Regional Medical Center (LRMC) Lung Team with an ECLS Unit Type Code
- Provide SME and transport support to the Tripler Army Medical Center ECLS team
- Collaborate with other clinical and research sites in the DoD
  - Center for Sustainment of Trauma and Readiness Skills (CSTARS) - Baltimore
  - CSTARS Cincinnati/St. Louis
  - David Grant Medical Center

Education and Training:

- Supports graduate medical education in Trauma/Critical Care, General Surgery, Burn Surgery, Internal Medicine, Cardiology, and eventually Emergency Medicine
- Provides training for 6 staff physicians, 2 Trauma/Critical Care fellows, 2 Burn fellows, 10 Burn ICU nurses, and 4 respiratory therapists
- Provides neonatal and pediatric Extra-Corporeal Membrane Oxygenation nurse specialists opportunities for additional training
- Offers training to personnel who makes a permanent change of station to LRMC

Readiness:

- ECLS for combat casualty transport has saved multiple lives to date
- Pumpless support used in the past has been upgraded to full ECLS recently
- The LRMC Lung Team has now transported 2 patients from the Area of Responsibility to LRMC on ECLS
- Multiple additional patients have been started on ECLS after arrival at LRMC
- These patients currently receive their ECLS care at a German civilian hospital
- A Critical Care Air Transport Team or Burn Flight Team model could be used to bring these patients to SAMMC in the future

Research:

- SAMMC Adult ECLS briefings to date include:
  - 2011 Air Education & Training Command Symposium, San Antonio, TX
  - 2011 American Burn Association, Chicago, IL
  - 2011 International Aeromedical Evacuation & Enroute Medical Care Conference, Tacoma, WA
  - 2011 Air Force Medical Service Medical Research Symposium, Washington, D.C.
  - 2011 Advanced Technology for Combat Casualty Care, Ft. Lauderdale, FL
  - 2011 American Association of Chest Physicians, Honolulu, HI
  - 2011 Airlift/Tanker Association, Nashville, TN
  - 2012 Association of Military Surgeons in the United States Conference, San Antonio, TX
2012 AETC Symposium, San Antonio, TX

- SAMMC Adult ECLS publications to date include:
  - Derdak S, **Cannon JW**. “Rescue oxygenation therapies” for severe H1N1-associated ARDS. Crit Care Med. 2010; 38(11): 2257-8
FACT SHEET

Graduate Medical Education (GME) Platform

MISSION: The mission of the San Antonio Uniformed Services Health Education Consortium (SAUSHEC) is to graduate physicians and allied health specialists who are qualified, competent, and morally and ethically suited for medical careers in the uniformed services of the United States. To accomplish this, SAUSHEC oversees and ensures that graduate medical education (GME) and graduate allied health education (GAHE) programs within the consortium comply with requirements of the Accreditation Council for Graduate Medical Education (ACGME) or other accrediting agencies, are of the highest quality, and meet the needs of the Department of Defense.

Background:
SAUSHEC is the Sponsoring Institution recognized by the ACGME, Brooke Army Medical Center and 59th Medical Wing Commanders, and the Department of Defense for military GME and GAHE in San Antonio.

- Created in ~1996 via Memorandum of Agreement between the Army and the Air Force Surgeon Generals
- Preceded by the Joint Military Command in 1987 with two programs integrated (Urology and Emergency Medicine)
- Primary clinical sites are San Antonio Military Medical Center (SAMMC) and Wilford Hall Ambulatory Surgical Center (WHASC)
- Major participating training sites include the University of Texas Health Science Center San Antonio (UTHSCSA), Carl R. Darnall Army Medical Center, Audie Murphy South Texas Veterans Health Care System, and Children’s Hospital of San Antonio.
- Hosts 37 Graduate Medical Education programs (17 residencies, 20 fellowships)
- Hosts 23 Graduate Allied Health Residency programs (13 residencies, 10 fellowships)
- Trains approximately 700 military residents per year (60% Air Force, 40% Army)
- Supports two GME programs sponsored by UTHSCSA (Psychiatry and Nephrology)
- SAUSHEC GME programs outperform most civilian programs in national accreditation standards, graduate board pass rates, and in-service test scores.
FACT SHEET

Hearing Center of Excellence (HCE)

MISSION: To heighten readiness and to continuously improve the health and quality of life for members of the Armed Forces and Veterans through advocacy and leadership in the development of initiatives focused on the prevention, diagnosis, mitigation, treatment, rehabilitation, and research of hearing loss and auditory system injuries.

- HCE was legislated by Congress in the fiscal year 2009 National Defense Authorization Act
- HCE was directed (to the maximum extent practicable) to partner with the Department of Veterans Affairs (DVA), institutions of higher education, and other appropriate public and private entities
- The HCE’s primary responsibilities include:
  - Developing a data registry to track hearing loss and auditory system injuries across the Armed Forces and sharing the data in the registry with the DVA
  - Encouraging and facilitating the conduct of research
  - Developing best practices and clinical education
  - Ensuring coordination of rehabilitation benefits and services offered by the DVA to former Service Members
- In October 2009, the Air Force Medical Service was officially designated as the Department of Defense lead component for the HCE
- The HCE was established to develop strategies to address tinnitus and hearing loss, which are the most prevalent service-connected disabilities
- With over $1 billion spent by the DVA for 800,000 veterans with tinnitus and hearing loss, establishing a center focused on auditory issues has the potential to reduce, not only the disability cost of hearing loss, but the degree of impairment suffered by Service Members

Vision: To fulfill America’s commitment to all who support and defend our Nation by serving as the nation’s premier center for promoting excellence in the prevention, diagnosis, mitigation, treatment and rehabilitation of hearing loss and auditory system injuries for our Military Service Members and our Veterans.
FACT SHEET

Hyperbaric Medicine

MISSION: The primary hyperbaric capability in the Air Force was relocated March 21, 2008, from Brooks City-Base, Texas, to the Wilford Hall Ambulatory Surgical Center (WHASC) at Lackland Air Force Base, Texas. Hyperbaric chambers are used to perform hyperbaric oxygen therapy, which supplies a surplus of oxygen to the tissues, which helps wounds heal and allows white blood cells to fight infection. Also, breathing high concentrations of pure oxygen under increased atmospheric pressure can remove excess nitrogen and carbon monoxide from the body.

Background: Air Force officials have used hyperbaric oxygen therapy for more than 30 years. Originally, the therapy was used to treat aviators and aircrew trainees who suffered decompression sickness.

- Presently, hyperbaric oxygen therapy is used to treat not only decompression sickness, but also carbon monoxide poisoning, and problem wounds such as non-healing ulcers, compromised skin grafts, radiation soft tissue damage, and chronic infections and burns
- WHASC officials purchased two new hyperbaric chambers and began hyperbaric oxygen therapy in the hospital March 24, 2008
- The new department is staffed with physicians (who are board-certified in hyperbaric medicine), fellows, nurses, technologists and maintenance technicians. Each is trained in the administration of hyperbaric oxygen therapy
FACT SHEET

Joint Warfighter Refractive Surgery Center of Excellence

MISSION: The mission is three-fold--readiness, education and research.

Vision: Provide the Best Refractive Technology and Outcomes to Give our Most Important Weapons System: Our People—The Combat-Edge in Vision!

Readiness: This is our most critical and important mission.

- The Department of Defense (DoD) only Joint Refractive Surgery Center
- Provide State-of-the-Art Refractive Surgery to our Active-Duty
- The only laser center authorized to perform Laser-Assisted In-Situ Keratomileusis (LASIK) on Air Force Pilots
- The highest-volume Refractive Surgery Center in the Air Force
- Performed over 31,214 Surgeries to date with no sentinel events
- The referral center for all complicated refractive cases
- Provides Surgical Services to eight Army posts within the Southern Regional Command

Education:

- The only Air Force Ophthalmology Residency and the DoD’s Largest Ophthalmology Residency Program
- The only Air Force Center with Certified Physician Trainer for Laser Refractive Surgery
- Certification Authority for all Air Force Optometrists for co-management of refractive surgery patients and conducts the only Army Optometry Co-Management Course
- Training agreement with University of Texas Health Science Center to train Civilian Ophthalmology Residents in Refractive Surgery
- National Center of Excellence in Refractive Eye Care

Research:

- The Operational Test and Evaluation Center for all emerging Refractive Technology
- Conducted the Federal Drug Administration Trial for Wave front-Guided PRK with Naval Medical Center San Diego
• Over 15 Papers and Posters presented Annually at National and International Ophthalmology and Refractive Surgery Meetings
• Ongoing research in the correction of Presbyopia, phakic intraocular lens, and other refractive procedures
• Collaboration with United States Air Force School of Aerospace Medicine and Aeromedical Consult Service for Aviation LASIK Study and Outcome tracking of Aviation and Refractive Surgery
FACT SHEET

Naval Medical Research Unit San Antonio (NAMRU-SA)

MISSION: Conduct medical, dental, and directed energy biomedical research, that focuses on ways to enhance the health, safety, performance, and operational readiness of Navy and Marine Corps personnel and addresses their emergent medical and dental problems in routine and combat operations.

The Modeling and Simulation Program: Conducts research to generate and test computational models representing the physical interaction of all forms of Electromagnetic Energy (EM) with biological systems ranging from single cells to complex organisms. These models are used to estimate and ensure EM source standards compliance, and to understand the effects of new EM sources on biological, biomedical or novel materials to include nanomaterial.

Combat Casualty Care Research Department: The Resuscitative Medicine Program (RMP) conducts Research, Development, Test & Evaluation (RDT&E) focused on the protection, resuscitation and stabilization of combat casualties at Echelon 1 and 2 points of care in the combat theater. As combat injuries are often sustained in fluid, austere environments, with anticipated delays in transition to Echelon 3 and higher definitive care, RMP strives to improve current military relevant models of combat injury, in order to reflect evolving battlefield conditions and injury types, resulting in the establishment of better methods for diagnosis and treatment.

The Trauma Medicine Program (TMP): TMP, in synergy with RMP, conducts primary and pre-clinical RDT&E for the development and optimization of drug products and advanced therapies for the treatment of hemorrhagic shock (blood replacement products and blood component therapies) as well as trauma-associated conditions, like multi-biologic infection sepsis, and complex injuries, which commonly occur on the battlefield. TMP harnesses pharmaceutical, biotechnology-based and medical device-based technologies to develop cutting edge solutions for trauma related pathologies.

The Expeditionary Medicine Program (EMP): Works with U.S. Marine Corps and Navy operational commands to identify and effectively mitigate operational stressors and improve survivability through the evaluation of products and agents that deliver capabilities to meet rapidly evolving Expeditionary Warfare requirements.

Dental and Biomedical Research Department: The Applied Clinical Science Program emphasis is on the development of new restorative dental materials, as well as the
epidemiology, diagnosis, treatment, and prevention of oral/dental diseases that affect the health, performance and readiness of Sailors and Marines.

**The Applied Laboratory Science Program:** Conducts research in dental and the allied health sciences with an emphasis on microbiology, immunology, etiology, diagnosis and prevention of medical and dental diseases and develops diagnostic tools to detect infectious diseases from saliva samples.

**The Dental Materials and Equipment Program:** Conducts research, development, test and evaluation of systems and technologies to minimize the environment impact and occupational hazards of Navy Dentistry. This includes mobile dental delivery systems for use by the Fleet Marine Force and dental treatment byproducts in deployed environments.
FACT SHEET

Tri-Services Research Laboratory (TSRL)

MISSION: Provide increased military capabilities for studying directed energy weapons effectiveness, and ways to protect service members by improving health and safety standards for safe exposures to directed energy devices. The TSRL houses Navy, Air Force and Army research programs that address the health and safety effects of exposure to a variety of stressors. The TSRL includes various laser and biological research labs and echo-free chambers, enabling the Navy, Air Force and Army to simultaneously conduct research on the biological effects of directed energy.

NAVY: Directed Energy Biomedical Research Department studies the effects of directed energy (non-ionizing Electromagnetic (EM) radiation) upon living systems. EM sources are used extensively in the Navy in diverse application ranging from communications, jamming, target designation, surveillance and new medical therapies, and emit radiation throughout the spectrum including radio-frequency, millimeter wave and optical frequencies. This research ensures that exposure standards are adequate to protect the health and safety of all personnel operating in and around these sources. Research also identifies and characterizes new directed energy threats in the operational environment.

AIR FORCE: Directed Energy Bioeffects Department captures and quantifies the biological effects of directed energy weapons, so researchers can develop non-lethal weapons and the defensive means to protect our own service men and women from this type of weapon. The Air Force’s Tri Service Research Lab (TSRL) currently supports efforts conducted by the RESTOR regenerative medicine program. Current research focus areas which most commonly is considered the realm of stem cells, biologic and synthetic matrices, and growth factors, also represents a focus of much attention in the Air Force both in the basic science and clinical arena. Vascularized composite allotransplantation (VCA) for extremity restoration and extremity transplantation offers true restoration of form and function acutely in a manner that no other reconstructive modality can. Ischemia reperfusion injury ameliorization in transplanted tissues is a focus of the RESTOR program supported by the TSRL. Current approved Institute Animal Care and Use Committee (IACUC) protocols at the TSRL will support meeting translational research requirements addressing Ischemia reperfusion injury (IRI) inherent in vascularized composite allotransplantation. This research will greatly improve outcomes limit chronic rejection and form the basis for ongoing translational research efforts.

ARMY: The Veterinary Science Department works in parallel with staff researchers to provide services, facilities, and technologies to support the diverse animal-based research requirements. The veterinary staff performs comprehensive oversight to ensure the ethical use of laboratory animal models under controlled and healthful conditions. The staff also manages the preventive medicine programs and provides preoperative and post-operative care for the research animal models. Experienced scientific and technical personnel offer consultation and assistance in the design of research protocols and in the selection of appropriate models to meet the research objectives of investigators.
FACT SHEET

59 MDW Substance Abuse Program

MISSION: Provide background for JPC-5 on research activities for San Antonio Military Substance Abuse Research Team (SAMSART) to include basic science research, sophisticated surveillance research using medical databases, and treatments in a multicenter approach with a goal of reducing substance abuse among military members by obtaining program funding to support uninterrupted research protocols.

Background: The Department of Defense (DoD) Office of the Army Surgeon General Pain Management Task Force (May 2010) and the Chairman of the Joint Chiefs of Staff, Admiral Mullen’s report “Systems Approach to Drug Demand Reduction in the Force” support the need to better understand opioid abuse and reduce it.

- The White House 2010 National Drug Control Strategy that specifically calls out opioid abuse in the military as a national priority for which further resources must be allocated (2010 Office of National Drug Control Policy)
- 2009 DoD Health Related Behaviors Survey lists prescription opioid as the most common drug abuse, above illicit drugs. Among active duty personnel, 15% misused a prescription drug in the past month and 26% in the past 12 months - Our recent data from Texas military bases confirms this behavior with increasing abuse over the last 4 years
- Additional research is needed from an experienced joint military/civilian research group to 1) better understand opioid abuse 2) validate treatments and 3) understand the psychosocial factors facilitating the growth of substance abuse

Discussion: San Antonio has a unique, experienced team of military (Army and Air Force, San Antonio Military Medical Center (SAMMC) and civilian investigators (University of Texas Health Sciences Center- San Antonio (UTHSCSA), and University of Texas San Antonio (UTSA) who conduct substance abuse research and have a large collaborative group of civilian, military, and combat wounded patients to study.

- A UTHSCSA team member is site PI for National Institutes of Drug Abuse (NIDA), National Drug Abuse Treatment Clinical Trials Network (CTN) which is interested in fostering military collaborations. UTHSCSA team members have experience in using electronic medical records to manage chronic opioids use, pain/abuse, and screening for markers of substance abuse
- UTSA Vice President for Research is interested in deepening military collaborations, tapping their expertise in many areas such as neurosciences, immunology, genomics and proteomics, computational biology
- SAMMC Military Team Members have experience and funding record in proteomics, clinical biomarkers, suicide with overdose, pharmacokinetic and pharmacodynamics of
abused prescription drugs, chronic pain and detecting concomitant opioid use, and detecting prescription drug (stimulant and opioid) abuse with novel saliva and urine testing

- SAMSART consists of a military 59 MDW basic science toxicologist with lab support, an Army Warrior Resiliency Program scientist, the SAMMC Chief of Medical Toxicology, the SAMMC Chief of Pain Medicine, a 59 MDW senior epidemiologist, UTHSCSA NIDA supported psychologists, health services researchers, and basic scientists at UTSA
- SAMSART steering committee will be made of USAF Scientific Advisor to the USAF Surgeon General and 59 MDW Chief Scientist, Director of Diagnostics and Therapeutics Research and a Senior Analytical Toxicologist, UTHSCSA Director of Health Outcomes Research, a STRONG STAR Director, and other regional experts in research, opioid use and substance abuse
- Toxicological analytical and pharmacokinetic work with be performed at the 59 MDW, genomic work at UTHSCSA, and proteomic work at Pacific Northwest National Laboratories (Dept. of Energy), and genomics/proteomics and computational biology at UTSA
- Patient population will be combined from three hospitals, pharmacy databases from UTHSCSA and SAMMC, and DoD health records (at Fort Sam Houston) are in proximity and can be used
- Current studies – Congressionally Directed Medical Research Programs funded study to evaluate proteomic expression of blood and in healthy volunteers after dosing of hydrocodone, Military survey studies to quantify prescription drug abuse on military bases and in the adjacent communities, Use of Poison Center Drug Identification Exchanges as a marker of military substance abuse, Detection of prescription stimulant use with saliva matrixes, Evaluation of urine drug testing for opioid abuse in primary care and pain clinics
- Proposed/In development studies – Systems biology evaluation of opioid abuse in a chronic pain population to understand the proteomic response and to detect biomarkers of abuse, Prescription monitoring project in military medical facilities, Clinical trial of novel oral analgesic to reduce opioid dependency, Evaluating psychological predictors as a determinant of opioid misuse in chronic low back pain, and Primary care redesign to support effective management of chronic pain with opioid and reduce opioid abuse, and additional studies within the NIDA CTN

Summary:

- 59 MDW/CC and SAMMC/CC supports substance abuse research
- With receipt of funds and Institutional Review Board approval, hiring of staff and equipment purchases, in support of the Substance Abuse program will begin. The program will allow research protocols to be completed without interruption. Resources for additional funding will be monitored and proposals will be submitted to conduct follow on studies
- The proposed studies will be clinical trial work, minimal risk studies, retrospective studies, and database analysis are low risk and involve consenting subjects for retrospective review as well as monitoring bio-fluids and evaluating proteomic changes
FACT SHEET

University of Texas Health Science Center San Antonio (UTHSCSA)

MISSION: The mission of The University of Texas Health Science Center at San Antonio is to make lives better through excellence in education, research, health care and community engagement:

- Educating a diverse student body to become excellent health care providers and scientists
- Engaging in research to understand health and disease
- Commercializing discoveries, as appropriate, to benefit the public
- Providing compassionate and culturally proficient health care
- Engaging our community to improve health
- Influencing thoughtful advances in health policy
- Educate health professionals to provide the best possible health care for San Antonio, the entire South Texas community and the state of Texas; to apply state-of-the-art treatment modalities; and to continue to seek information fundamental to the prevention, diagnosis and treatment of disease
- Play a major regional, national and international role as a leading biomedical education and research institution in the discovery of new knowledge and the search for answers to society’s health care needs
- Be an integral part of the health care delivery system of San Antonio and the entire South Texas community, as well as an important component of the health care delivery system of Texas and the nation
- Serve as a catalyst for stimulating the life science industry in South Texas, culminating in services and technology transfer that benefit local and state economies
- Offer continuing education programs and expertise for professional and lay communities

Background: The UTHSCSA, one of the country’s leading health sciences universities, ranks in the top 3 percent of all institutions worldwide receiving National Institutes of Health (NIH) funding. Research and other sponsored program activity totaled a record $259 million in fiscal year 2009. The university’s schools of medicine, nursing, dentistry, health professions and graduate biomedical sciences have produced approximately 26,000 graduates. The $744 million operating budget supports eight campuses in San Antonio, Laredo, Harlingen and Edinburg.

Purpose: The purpose of The UTHSCSA is to provide the best in health careers education, biomedical research, patient care and community service to San Antonio and the South Texas/Border Region. Through undergraduate, graduate and postgraduate programs, the faculty is committed to educating health professionals who will provide excellent patient care and research that can be applied to treat and prevent disease.
Facts at a Glance:

- Year established: 1959. Year doors opened: 1968
- President: William L. Henrich, M.D., MACP
- Total annual enrollment: 3,621, plus 1,094 residents and fellows
- Eight campuses, in four cities
- Total graduates: 25,856
- Total workforce: 5,783
- Annual budget: $744 million
- Budget coming from state appropriations: 21 percent
- Ranked No. 1 in Texas for aging research funding from the National Institute on Aging
- Ranked in the top 3 percent of all institutions worldwide receiving NIH funding
- Annual research and other sponsored program activity: $259 million FY11
- Endowments: $367 million market value
- Chief catalyst for the $24.5 billion biosciences and health care industry in San Antonio
- NIH FY11 grant funding: $127 million
- Ranked in the top 3 percent of all institutions worldwide receiving federal funding
- Institute of Medicine members: 6
- Almost $23 million in uncompensated care in FY 2010
The University of Texas at San Antonio (UTSA)

**MISSION:** The UTSA is dedicated to the advancement of knowledge through research and discovery, teaching and learning, community engagement and public service. As an institution of access and excellence, UTSA embraces multicultural traditions and serves as a center for intellectual and creative resources as well as a catalyst for socioeconomic development—for Texas, the nation and the world.

**Vision:** To be a premier public research university, providing access to educational excellence and preparing citizen leaders for the global environment.

**Core Values:** UTSA encourages an environment of dialogue and discovery, where integrity, excellence, inclusiveness, respect, collaboration and innovation are fostered. UTSA's core values reflect how we have pursued our plan as well as how we will fulfill our mission and realize our vision. Each value reflects rich, shared meaning:

- Integrity: adhering to a standard of core values at UTSA and ensuring that one acts in a fair and ethical fashion
- Excellence: commitment to delivering consistently high-quality service, teaching, and research through superior performance
- Inclusiveness: fostering diversity and providing access to educational and socioeconomic opportunities for all - regardless of individual backgrounds and philosophies
- Respect: treating others with civility and openness, recognizing the dignity inherent in each individual
- Collaboration: working with others toward common goals while valuing teamwork, participation, and commitment to public service
- Innovation: encouraging ingenuity, creativity, and discovery

**Academics:**

- UTSA currently has a Graduate School and eight colleges including:
  - Business
  - Education and Human Development
  - Engineering
  - Honors
  - Liberal and Fine Arts
  - Public Policy
  - Architecture
  - Sciences
Vascular Injury and Forward Damage Control Surgery (VIFDCS)

MISSION: Investigate and translate effective strategies and means to expeditiously manage combat-inflicted injuries and maintain homeostasis, thereby limiting cellular damage and additional complications. Within this research area, there are numerous gaps in injury research models and military capabilities for effective intervention in vascular trauma and the optimization of adjuncts during resuscitation in military environments.

Vision: Enable Air Force medical personnel to employ evidence-based Clinical Practice Guidelines and validated technologies for hemorrhage control and treatment of patients with vascular injuries in Air Force expeditionary medical and aero-medical evacuation systems, while providing superior quality of care for military health system beneficiaries within the Air Force scope of operations. The VIFDCS Research Program studies, develops, demonstrates, and translates materiel and non-materiel solutions to address these gaps to enhance surgical and pharmacological interventions required to achieve improvements in mortality, limb salvage, functionality, and quality of life for traumatically injured patients.

Key Research Areas:

- Wartime extremity injuries and disruption of blood flow resulting in ischemia, as they represent the leading pattern of injury on the battlefield and common cause of chronic limb dysfunction and amputation
- Hemorrhage within the torso commonly defined as Non-compressible vascular injury which also remains a leading cause of potentially preventable death and of amputation on the battlefield and in civilian centers
- Novel technologies which show tremendous potential to restore a person's ability to live and work as normally as possible after a disabling vascular injury or other trauma beyond the battlefield such as the use of regenerative vascular graft and tissue scaffolds augmented with pharmacologic to maintain limb arterial vascular supply and reconstruct peripheral blood vessels in tissue auto- and allo-transplantation
- Characterization of the relationship between eventual quality of limb and psychological recovery or well-being through the investigation of patient based outcomes following extremity vascular injury. This research will help determine the links between acute injuries, clinical management information and authentic patient-based outcomes years following injury
- VIFDCS Task Area received sponsorship in Apr 2011 establishing a focal point for vascular injury and forward damage control research
- The VIFDCS concept is currently part of the Air Force Combat Casualty Care Center with the Joint Battlefield Health and Trauma Institute located at Ft. Sam Houston, TX
VIFDCS serves as the focal point for studying vascular injury through research protocols. Developing clinical knowledge to address capability gaps related to vascular injury in forward locations.

All VIFDCS human and animal research protocols are managed thru the oversight of the Institutional Review Board (IRB)/Battlefield Health Trauma and 59 CRD IRB’s and Institutional Animal Care and Use Committee’s.

The VIFDCS is currently engaged in 3 human, 10 animal and 3 training protocols. Graduate Medical Education program is supported through resident driven research. Results of ground breaking research were presented at national/international meetings, and published in nationally recognized medical journals.
59 MDW Nursing Research Division

The Nursing Research Division at the 59th Medical Wing is one of three Air Force nursing research cells dedicated to the conduct of research and the promotion of nursing inquiry. Their mission is to conduct and promote research and translate evidence to optimize nursing practice, patient outcomes, population health, and education and training across the Military Health System. At the 59 MDW, there are two doctorally-prepared nurse scientists (1 active duty and 1 contractor). In addition, there is one doctorally-prepared nurse scientist serving as Dean of Academics, METC (Fort Sam Houston) who collaborates on 59 MDW research efforts. Clinical research studies are conducted within the following foci.

Key Research Areas:

- Maternal identity formation
- Maternal anxiety and stress and its impact on pregnancy and birth outcomes
- Family functioning and deployment on pregnancy and birth outcomes
- Paternal adaptation
- Patient centered medical home
- Secure messaging
- Population health quality indicators
- Resilience
- Positive emotions
- Health care literacy
- Sexual assault/harassment

Active Nursing Research Protocols and Evidence-based Practice Project (EBP) Projects:

- Mentors Offering Maternal Support (M.O.M.S): Building resilient military families (PI: Col Karen Weis; AIs: LtCol Brenda Morgan; LtCol Candy Wilson); a new AIM was added to current study protocol—Linking pregnancy stress to specific biomarkers: Testing a military intervention (added AI: Dr. Theresa Powell, PhD and LeeAnn Zarzabal, MS)
- Cohesion: Understanding the relationship between family cohesion and adaptability to birth outcomes in a military population (PI: Col Karen Weis)
- Retlationship between total force fitness and access to care in military personnel (PI: Dr. Sandra Bibb; AI: LtCol Brenda Morgan)
- Dad’s adaptation during deployment (DADDs) (PI: Col Karen Weis; AI: Dr. Lorrie Powel, PhD)
- Screening for Iron Deficiency in Military Trainees (EBP Project.: Lt Col Candy Wilson and Lt Col Mary Kay Goetter)
FACT SHEET

San Antonio Military Medical Center (SAMMC)

SAMMC is located on Fort Sam Houston in San Antonio, Texas and is the largest inpatient medical facility in the Department of Defense. It plays a critical role in patient care, graduate medical education and research, as well as taking care of wounded service members.

The hospital staff provides inpatient care in a 2.1 million-square-foot, 425-bed, and state-of-the-art medical treatment facility.

As a certified Level 1 Trauma Center, SAMMC receives more than 5,700 emergency room visits each month. It is one of only 31 hospitals in the United States that holds both Level 1 Trauma certification and accreditation from the American burn Association.

In addition, 40 beds are dedicated to the Army Institute of Surgical Research, which operates the only Department of Defense Burn Center—The Army Burn Center.

The hospital, formerly Brooke Army Medical Center, had cared for thousands of service members who were injured in Operations Iraqi Freedom and Enduring Freedom, and nearly 1,500 medical professionals have been deployed in support of those missions. Since the Global War on Terrorism began in September 2001, the Burn Team had made frequent trips to Landstuhl Army Regional Medical Center in Germany, transporting patients back to SAMMC for care.

The hospital sustains over 89 accredited educational programs to include 38 graduate medical education programs, six nursing programs with two nursing accredited programs, Emergency Medical Technician Basic certification programs, 25 allied health educational programs, 18 enlisted allied health and Practical Nurse Course medic phase II training programs along with additional programs in administration and allied health specialties.

SAMMC services include:

- 32 Operating Rooms for Inpatient and Ambulatory Surgery
- Medical, Pediatric and Surgical Subspecialty Clinics
- Primary Care
- Labor/Delivery/Recovery Unit
- Neonatal Intensive Care Unit (NICU) with ECMO (extracorporeal membrane oxygenation)
- Pediatric Intensive Care Unit (PICU)
- DOD’s only Bone Marrow Transplant Unit
- Inpatient Psychiatry Unit
- State of the-art Cardiac Catheterization Lab
- DOD’s only Rooftop Helipad
FACT SHEET

SAMMC- Department of Clinical Investigation

The mission of the Department of Clinical Investigation (DCI) mission is to support Graduate Medical Education (GME), to facilitate improvements to health care and the introduction of new technology. Additionally, the DCI Mission is to assure compliance with federal regulations for the protection of human research subjects and for the responsible use of animals in medical research and training. The DCI facilitates and supports the entire process of research approval including research proposal preparation, submission, review, monitoring, funding and contract management of approved research, by providing program administration, education and consultation for all research activities at Brooke Army Medical Center and the Three Military Facilities (Fort Hood, TX, Ft. Polk, La and Ft. Sill, OK) and clinics covered under its Assurances.

DCI Research Service:

The mission of SAMMC DCI Research Service is to promote, coordinate, support and oversee organized scientific inquiry in basic laboratory research, clinical research, and pre-clinical research using human and animal subjects at SAMMC and the Southern Regional Medical Command (SRMC). The DCI Research Service also supports graduate medical education (GME) by encouraging and supporting research that includes residents at SAMMC. The DCI Research Service staff includes physiologists, biochemists, cellular biologists, immunologists, and a veterinarian, all with research experience including designing and executing research proposals and publication of results in peer-reviewed journals. These individuals are available by appointment to aid in research guidance and support. DCI Research service can be broken down into three categories: human research, animal research, and laboratory research.

Part of the DCI’s mission is to support GME. Specifically, the DCI desires to get residents involved in research. Intramural funding up to $7500 per year may be available for research projects that involve resident participation.
FACT SHEET

SAMMC- Zachary and Elizabeth M. Fisher Bone Marrow Transplant Program

Mission: The San Antonio Military Medical Center (SAMMC) Zachary and Elizabeth M. Fisher Bone Marrow Transplant Program is the sole DoD designated treatment facility for adult allogeneic (related donor, unrelated donor, and cord blood) and one of two DoD facilities providing autologous hematopoietic stem cell transplants. The Program provides a full spectrum of care with state-of-the-science practices and technology to all beneficiaries requiring high-dose chemotherapy in the inpatient and outpatient settings. The Program is accredited by the Foundation for the Accreditation of Cellular Therapies (FACT) which assures optimal care is provided to transplant patients from diagnosis through the recovery phase of their transplant.

Location and Facility: The Transplant Program is located in the newly constructed Consolidated Tower (COTO) of the SAMMC facility at Fort Sam Houston, Texas. Comprehensive and multidisciplinary care is provided by the Transplant Program in their 21,222 square foot space facility by a team of specially trained personnel and in concert with consultants from San Antonio Military Medical Center facilities.

History: The Program was established in 1983 and performed its first allogeneic hematopoietic stem cell transplant in 1986. Since its inception it has performed more than 738 autologous hematopoietic stem cell transplants and 786 allogeneic hematopoietic stem cell transplants. The Program was awarded FACT accreditation in 2005. FACT sets standards that establish minimum performance guidelines for hematopoietic stem cell transplant programs and provides oversight to assure the standards are met.

The Program is comprised of a 14 private bed inpatient unit. Twelve of those rooms have positive pressure air flow and two are negative pressure. There are two nurse’s stations to provide convenient and safe access to patient rooms.

The Program’s outpatient clinic offers 24/7 staffing to ensure appropriate support for those patients undergoing outpatient treatment. The clinic is comprised of three examination/isolation rooms, two procedure rooms, and eight treatment stations.

The Program has a multi-disciplinary team consisting of a clinical dietician, medical social worker, clinical nurse specialist, transplant coordinator, fellows, residents, nurses, students, and staff physicians. Daily rounds ensure continuity of care.

The Transplant Program in concert with the Hematology/Oncology Program supports the Graduate Medical Education through the Hematology/Oncology Fellowship Program and the Internal Medicine Training Fellowships.
FACT SHEET

Extremity Trauma Research and Regenerative Medicine- USAISR and the Clinical and Rehabilitative Medicine Research Program, USAMRMC, Fort Detrick, MD

Research is focused on defining the injuries being incurred and conducting preclinical studies to determine which therapies have the greatest potential for treatment of infection, soft tissue injury, and bone injury. The regenerative medicine program is investigating stem cell utilization as a therapy for these types of injuries. This group is also involved in a multi-center consortium for clinical trials and with the Armed Forces Institute of Regenerative Medicine (AFIRM).

**Background:** The majority of battlefield wounds occur to the extremities. In fact, 82% of battlefield injured Warriors have at least one extremity injury; penetrating soft tissue wounds, burns, and open fractures account for most of these wounds. Infection and nonunion of fractures, loss of muscle function, and the inability to achieve skin closure with vascularized skin are common complications and continues to be a significant source of morbidity and mortality. The Extremity Trauma and Regenerative Medicine task area is addressing these problems several different ways with the ultimate goal of returning the injured Warrior to full function.

1. **The Warriors’ injuries and their clinical outcomes are being defined.**

   To help direct research efforts, retrospective studies were conducted to determine the incidence and qualitative outcomes of extremity injuries in the Iraq and Afghanistan conflicts. The wounds of a cohort of 1,566 battlefield injured Warriors are being fully characterized and followed throughout medical retirement. It has become apparent that lack of effective treatment options for osteoarthritis, skeletal muscle conditions, back conditions, and nerve injury are the main reason why many injured Warriors never fully recover. A database of over 200 type 3 open tibia fractures is being used to determine what causes poor clinical outcomes. Infection and nonunions are the primary complications. Although this effort had provided significant insight into the clinical issues, it isn’t enough. An orthopedic registry that has data elements specific to extremity injuries has been created and will be used in conjunction with the Joint Theatre Trauma Registry.

2. **Pre-Clinical studies are conducted to determine which therapies have the greatest clinical potential.**

   We strive to evaluate the most advanced and promising technologies using the most clinically relevant and stringent animal models possible. Various pre-clinical animal models have been established and utilized to evaluate potential therapies for infection and soft tissue and bone injury, to include developing animal models for compartment syndrome, large contaminated musculoskeletal defects, large volumetric muscle loss and burn.
Relevant animal models have been created and collaborations with academic institutions have been established to develop innervated and vascularized muscle constructs to solve this skeletal muscle injury problem. The ability to utilize stem cells as a therapy for skin, muscle, and bone injuries has been established. A vascularized skin substitute for early burn wound coverage is being developed from the adipose layer of discarded burn skin. These stem cells are then used along with collagen and fibrin-based scaffolds to comprise the epithelial, dermal-vascular and hypodermal layers to develop a complete full thickness skin equivalent. Studies have been completed and are ongoing to improve the use of bone marrow-derived mesenchymal stem cells for bone regeneration. Significant advances towards improving the effectiveness of stem cells following muscle injury have been made. Clinical practice guidelines for irrigation of contaminated wounds have been created from studies that we first conducted in animals. The concept of a dual-purpose bone implant (i.e., promotes regeneration and prevents infection) was developed and is being evaluated by us. Outside collaborations are leveraged to make a wide variety of biomaterials readily available for evaluation in our animal models of soft tissue and bone defects. We are also standing up a comprehensive biofilm research effort. Significant basic science discoveries have been made, and we will translate them to the clinic.

3. Prospective clinical trials aimed at improving outcomes of extremity wounds have been initiated.

We have partnered with the Department of Orthopedics and Rehabilitation at Brooke Army Medical Center, and they are conducting several multi-center clinical trials in the areas of combat casualty care with seven more trials starting within a year. A multi-center clinical trials consortium, Major Extremity Trauma Research (METRC), through a cooperative agreement with Orthopedic Extremity Trauma Research Program (OETRP) has been created. Capable military orthopedic departments (to include Brooke), and 24 very large civilian centers, will be members of this consortium; this will help develop needed infrastructure, allow military personnel to gain expertise, and will further solidify a research culture within the military orthopedic departments. Recently, a prospective study demonstrated that an energy-returning ankle brace substantially improves running speed of Warriors who had severe lower extremity injuries. A prospective study is underway to evaluate the effectiveness of a regenerative medicine based therapy on Warriors who have suffered a large amount of volumetric muscle loss.

4. Other research programs are being actively leveraged.

The USAISR manages the OETRP and is an active partner in the Armed Forces Institute of Regenerative Medicine (AFIRM). The OETRP focuses on improving outcomes of extremity injuries within the next 5 years. This is accomplished by funding translational research projects that are evaluating new and emerging therapies and by conducting clinical trials that evaluate current standards of care and available treatments. To date, 26 preclinical and clinical studies have been funded, as well as the aforementioned consortium. AFIRM is a collaboration between the military and two civilian research consortia; it is focused on utilizing regenerative medicine to improve outcomes of injured Warriors who have sustained extremity, craniofacial, and burn injuries.
Most of the immediate clinical efforts from AFIRM will be in skin replacement and scar mitigation along with composite tissue allografts. The Dental Trauma Research Department is also at USAISR and is working on similar clinical problems; we partner and share resources and expertise whenever possible. Recently, we have begun collaborating with the Infectious Disease Department at BAMC, and our respective strengths complement each other well.

**Summary:** Great strides have been made in identifying the clinical challenges and barriers to optimum functional outcomes and addressing these challenges in a systematic fashion. Regenerative medicine therapies hold the key for complete recovery of severely injured Warriors. These therapies are emerging, but are not yet mature enough to make significant clinical improvements immediately. Pre-clinical work is required to determine what approaches are most effective; this work will serve as a pipeline for future clinical trials. Our goal in the immediate future is to continue to make incremental progress by evaluating and improving currently available therapies. As new and promising advances in regenerative medicine emerge, we will be ready and capable to implement them into the clinic with the goal of returning the injured Warriors to full function.
59TH MDW POST GRADUATE DENTAL SCHOOL & CLINIC

59th Dental Group
Home of the largest Dental Service in the Department of Defense. Building healthier communities by delivering compassionate and personalized dental healthcare.

Mission
Optimize dental readiness and patient centered dental care through collaborative healthcare delivery, education, training, and research.

Vision
Partners in a high-performance health system, dedicated to excellence in global dental care and dental education.

On June 20, 2012 The Air Force Post Graduate Dental School and Clinic was dedicated on Joint Base San Antonio-Lackland, Texas. This new state-of-the-art facility will train military dentists in advanced specialties and serve as a worldwide referral center. This modern $38 million building, the Air Force’s flagship dental school is located adjacent to Wilford Hall Ambulatory Surgical Center.

The 56,000 square foot facility, which replaces the aging MacKown Dental Clinic, is known for its Maxillofacial Prosthetics Fellowship program, the art of creating facial prosthetics to help wounded warriors with burns and injuries, cancer or birth defects. It also has the only stereolithography laboratory in the entire Air Force Medical Service, a three-dimensional process that makes prosthetics and implants from a computer image.

The AFPDS has one of the Air Force’s largest dental laboratories and produces more than $1 million in annual workload. It has over 5,000 square feet of laboratory space and 69 dental treatment rooms.

The school also trains Army, Navy and Canadian Forces. It is the most advanced building for residency education programs. Training of 85 percent of dental residents across the Air Force, with six dental residencies and two fellowship programs within the 59th Dental Group.

The school is a branch campus of the Uniformed Services of the University Health Sciences, dedicated to maintaining education excellence.
The San Antonio Military Health System (SAMHS) is led by Air Force (USAF) and Army (USA) general officers and is responsible for providing management and oversight of business, clinical, and educational functions of all Military Health System (MHS) medical treatment facilities (MTFs) located in the San Antonio metropolitan area. As one of the MHS’ first Enhanced Multi-Service Markets (eMSM), the SAMHS is comprised of USAF and USA units that include:

The 59th Medical Wing (component command structure) with subordinate units:

- North Central Federal Clinic
- Randolph Clinic
- Reid Clinic
- And Wilford Hall Ambulatory Surgical Center

Brooke Army Medical Center (component command structure) with subordinate units:

- Fort Sam Houston Primary Care Clinic
- McWethy Troop Medical Clinic
- San Antonio Military Medical Center (SAMMC)
- Schertz Medical Home
- Camp Bullis Taylor Burk Clinic

With these 9 MTF platforms, the SAMHS operates with a ~$1.2B budget and 12K staff who serves over 240K beneficiaries. As an integrated health system, the SAMHS continues to optimize the direct care system while strengthening the collaboration with Department of Veterans Affairs and Private Sector Care partners.

The SAMHS is dedicated to the highest quality, patient centered care with a clear focus on safety, access to care, and customer service, while providing first–rate graduate medical and other health education and training programs, conducting state-of-the-art research and maintaining the critical global readiness of all war fighters.

**Leadership**

Director: Major General Jimmie O. Keenan (USA)
Deputy Director: Major General Byron C. Hepburn (USAF)
Chief Operating Officer: Colonel Michael J. Higgins
Establishment of SAMHS

The Defense Realignment and Closure Act (as amended through the National Defense Authorization Act for 2006) directed changes to the MHS’ organizational roles, responsibilities, and locations within Joint Base San Antonio. Memorandum of Agreement establishing the SAMHS was signed by the Chiefs of Staff of the Air Force and Army on 27 Sep 10
SAMHS activated on 15 Sep 11
Deputy Secretary of Defense Memorandum, Implementation of the Military Health System Governance Reform, 11 Mar 13, designates the SAMHS as one of the first six eMSMs with an Initial Operating Capability (for enhanced authorities) set as 1 Oct 13

eMSMs

Six eMSMs designated across the MHS—Colorado Springs, Colorado; National Capital Region; Oahu, Hawaii; Puget Sound, Washington; San Antonio, Texas; and Tidewater, Virginia
Enhanced authorities include:
“…manage the allocation of the budget for the market…”
“…direct the adoption of common clinical and business functions for the market…”
“…optimize readiness to deploy medically ready forces and ready medical forces…”
“…direct the movement of workload and workforce between or among MTS..”

SUCCESSES

Community Partnerships/Collaboration
Federal Health Care Consortium
South Texas Regional Advisory Council (STRAC)
San Antonio Mayor’s Council of Fitness
Greater San Antonio Chamber of Commerce Health & Bioscience Committee
BioMed SA
VA/DoD test site for integrated Electronic Health Record (HER)
VA/DoD Integrated Disability Evaluation System (IDES)
North Central Federal Clinic joint venture between AF and VA

State-of-the-Art Healthcare
Largest DoD inpatient facility and only DoD Level 1 trauma center in United States with 425 inpatient beds and 32 operating rooms for inpatient and ambulatory surgery, providing trauma care to both DoD beneficiaries and the local community.
Largest DoD Outpatient Ambulatory Surgical Center
DoD’s only American Burn Association verified Burn Center
DoD’s only Bone Marrow Transplant Unit and Hematology/Oncology Clinic (ranking among the top cancer programs in the nation)
High-tech Cardiac Catheterization Lab
Center for the Intrepid provides full spectrum of amputee rehabilitation as well as advanced outpatient rehabilitation for burn victims and limb salvage patients with residual functional loss. DoD’s only rooftop helipad for patient transport. Renowned graduate medical education program (San Antonio Uniformed Services Health Education Consortium – SAUSHEC) with 35 programs and over 600 residents in training. Our residents are among the top rated in the nation in board certification.