U.S. Army Medical Research and Materiel Command

USAMRMC

PROTECT the Warrior
Sustain the FORCE

CONTENTS

U.S. Army Medical Research and Materiel Command

USAMRMC *Mission…*

Provide medical knowledge and materiel lifecycle management to protect, treat, and optimize Warfighter health and performance across the full spectrum of operations.

USAMRMC *Vision…*

We are the world's experts and leaders in the military relevant biomedical research and medical materiel communities, delivering the best medical solutions to enhance, protect, treat, and heal our Warfighters.

The USAMRMC is the Army's medical materiel developer, with lead agency responsibility for:

- Medical research, development, and acquisition
- Medical logistics management
- Medical information management/ information technology (IM/IT)
- Medical health facility planning

The USAMRMC's expertise in these critical areas helps establish and maintain the capabilities the Army needs to fight and win on the battlefield.

The USAMRMC Headquarters (HQ) at Fort Detrick, Maryland, supports 14 laboratories and organizations located throughout the United States. Six USAMRMC medical laboratories and institutes perform the core science and technology (S&T) research to develop medical solutions on the battlefield. These centers of excellence specialize in various areas of biomedical research, including infectious diseases, combat casualty care, operational medicine, clinical and rehabilitative medicine, and chemical and biological defense, and are staffed with highly qualified scientists and support personnel. A large extramural research program and numerous cooperative research and development (R&D) agreements provide additional S&T capabilities by the leading R&D organizations in the civilian sector.

Eight USAMRMC supporting organizations focus on other Command requirements, such as medical materiel development and logistics, facilities, IM/IT, and congressional special interest (CSI) programs, to complete the cradle-to-grave concept of medical materiel acquisition.

Together these laboratories and supporting organizations strive to fulfill the four critical areas that support the overarching mission of maximizing the health of the Warfighter for missions worldwide. Program outcomes such as medical information and products protect and sustain the health and safety of the force through deployment and combat. The USAMRMC motto, "Protect, Project, Sustain," emphasizes the Command's priorities in support of the Warfighter.

CRITICAL AREA PROGRAMS		PROGRAM OUTCOMES
Research & Technology Program	(1) Basic Research, (2) Applied Research, and (3) Advanced Technology Development to prove tech-base concepts for medical products (drugs, biologics, and devices)	Fielded Medical Knowledge
Advanced Development Program	(4) Advanced Component Development and Prototypes and (5) System Development and Demonstration of tech-base concepts or commercial products into FDA-approved, war-ready medical products	
Acquisition		
Medical Logistics Program	Field, distribute, sustain, maintain, and dispose of medical products, supplies, and equipment initiated in the tech base, advanced development, or from the commercial sector	Fielded Medical Materiel
Medical IM/IT Program	Operational IM/IT products and services to support the Army Medical Department, Military Health System, Department of Defense, and other government clients	Operational Medical IM/IT Services
Health Facilities Program	Plan, project, and execute innovative facility capital investment solutions to enhance delivery of health care and medical research	Health Facilities Plans

Medical Research, Development & Acquisition

Military Infectious Diseases Research

The Military Infectious Diseases Research Program (MIDRP) focuses on prevention, diagnosis, and treatment of diseases that can seriously hamper military mobilization, deployment, and effectiveness. Although there have been notable successes in this undertaking (after World War I, deaths from naturally occurring infections have not exceeded deaths due to combat injury in wartime), infectious diseases remain a major threat to operational readiness of U.S. military forces. MIDRP research emphasis includes the following:

- Development of vaccines to prevent endemic diseases impacting U.S. forces
- Discovery and development of prophylactic and treatment drugs for infectious diseases
- Techniques for rapid identification of disease organisms and diagnosis of infections
- Development of control measures against vectors of relevant infectious diseases
- Collection and analysis of epidemiological data that aid in control of relevant infectious diseases

Infectious diseases such as malaria, dengue, scrub typhus, and Japanese encephalitis had a significant impact on U.S. troop strength during World War II and the Vietnam War. Dengue and malaria caused illness among U.S. service members deployed to Somalia and Haiti. Additional threats to service members include diarrhea, leishmaniasis, meningococcal disease, HIV, and infection by hantaviruses and other hemorrhagic fever viruses. Threats vary depending on the environment in which Warfighters are deployed.

This prolific research program has helped produce licensed vaccines for rubella, hepatitis A and B, Japanese encephalitis, typhoid fever, adenovirus types 4 and 7, and meningococcal meningitis. Licensed drugs include mefloquine, doxycycline, and malarone for preventing malaria. The current dosing regimen for and definitive quantitation of the toxicity of pentostam for treating cutaneous leishmaniasis was developed by this program. Finally, the MIDRP has developed innovative new products for protection from disease-spreading insects.

RESEARCH WORLDWIDE

To minimize the risk of infectious diseases to military personnel, the USAMRMC has a comprehensive research program on disease surveillance, diagnosis, treatment, and prevention. This allows early recognition and response to both familiar diseases, like malaria, and newly emerging diseases, like hantavirus-induced hemorrhagic fever with renal syndrome, wherever they occur.

To protect against biting insects, the Camouflaged Bednet Shelter is impregnated with a quick-acting insecticide, and the Combined Camouflage Face Paint is blended with DEET.

The Chitosan Hemorrhage Control Dressing adheres to an injury site to stop severe bleeding.

Combat Casualty Care Research

Combat casualty care is constrained by logistics, manpower, and the hostile operational environment. Since mid-World War II, nearly 50% of combat deaths have been due to exsanguinating hemorrhage. Of those, about half could have been prevented if timely, appropriate care had been available. Head and lung injuries are also major causes of death where proper treatments and training could significantly reduce mortality and morbidity.

The Combat Casualty Care Research Program's (CCCRP's) goals are to significantly reduce the killed-in-action rate of American troops, the morbidity of combat injuries, and the medical footprint on the battlefield.

Difficulty treating battlefield casualties is exacerbated by the long evacuation times often found in military operations. This requires combat medics and physician assistants to stabilize patients for extended periods and makes battlefield trauma care markedly different from civilian trauma care.

Research efforts address:

- Products and methods that will reduce the number of battlefield deaths due to hemorrhage
- Strategies and diagnostics for resuscitation to improve survival when evacuation is delayed and resources are limited
- Advanced, noninvasive physiologic sensors for detecting penetrating or blunt trauma wounds and remote triage
- Technologies to improve the acquisition and availability of blood products far forward
- Prevention/treatment of dental disease and battlefield oral and maxillofacial injuries
- Surgical techniques, equipment, and implants to address extremity/musculoskeletal injuries
- Neuroprotective treatment strategies for brain and spinal cord injuries
- Intravenous clotting agents such as recombinant activated Factor VII (NovoSeven®) to greatly reduce internal bleeding thereby keeping Soldiers alive long enough to get to damage control surgery

Because approximately 86% of all battlefield deaths occur within the first 30 minutes after wounding, the ability to rapidly locate, diagnose, and render appropriate initial treatments is vital to reversing the historical outcomes of battlefield injuries. The need for care with a reduced logistics footprint is the cornerstone upon which the future of combat casualty care research is built.

The Combat Application Tourniquet® controls bleeding from extremity wounds.

The Golden Hour Blood Container can hold red blood cells and needs no power source to maintain its internal temperature.

Military Operational Medicine Research

The mission of the Military Operational Medicine Research Program (MOMRP) is to develop effective biomedical countermeasures against combat and operational stressors to maximize warrior health, performance, and well-being. The main research focus is on multistressor interactions involving human tolerances, metabolic physiology, psychological processes, and brain function that span the Warfighter Deployment Lifecycle. Research initiatives fall under the umbrella of four program areas: injury prevention, psychological health, physiological health, and environmental health. The products from this research transition to Army planners, doctrine, materiel developers, and the Army medical community.

Examples of products include physiological response and injury prediction tools, equipment design specifications and guidelines based on human tolerances, health hazard assessment criteria and methods, and strategies to reduce psychiatric casualties and enhance psychological resilience. MOMRP regularly examines and redefines its research priorities to fill gaps in its portfolio and leverage outside resources.

Injury Prevention

Injury prevention research develops models to predict the degree of injury from known threats, performance specifications for protective equipment, and other countermeasures to prevent injury or mitigate the threat to the Soldier. The scope of this research includes:

- Traumatic brain injury (TBI) and spine injury hazards
- Pulmonary injury hazards
- Occupational task performance and injury prevention
- Neurosensory injuries
- Sensory performance
- Nonionizing directed energy and bioeffects

Psychological Health

This research program area develops strategies and interventions that prevent and mitigate the negative psychological effects of combat and other operational stressors with the intent to optimize psychological health and emotional well-being of Soldiers and their families. Research includes:

- Stress and psychological resilience
- Deployment and post-deployment health protection
- Mental health and well-being
- Suicide prevention

Physiological Health

Physiological health research focuses on developing medical standards, predictive models, and countermeasures to prevent or mitigate the effects of physiological stressors such as nutrition, fitness, and fatigue on the performance and well-being of Soldiers. Research includes:

- Nutrition and metabolism
- Hydration management
- Physiological monitoring and predictive modeling
- Fatigue management

"Our warriors are our ultimate asymmetric advantage, the one thing that no enemy can duplicate now or in the future, and we need to keep them with us. We're committed to ensuring that the quality of life of our Soldiers, Families, and Civilians is commensurate with their magnificent service."

General George W. Casey, Jr.
Chief of Staff of the Army

The MOMRP understands this level of seriousness and sense of urgency and is committed to providing timely and relevant biomedical products and solutions that protect our Soldiers and enhance their performance during training and on the battlefield.

Environmental Health

The goal of the environmental health research program is to develop medical standards, predictive models, and countermeasures to prevent or mitigate the effects of extreme environments and toxic material exposure in the military. Research encompasses:

- Environmental health risk assessment methods
- Environmental extremes—heat, cold, and high altitudes
- Toxic material exposure

Current operations in Iraq, Afghanistan, and Bosnia have illustrated the urgent need for the biomedical solutions that the MOMRP provides. The Soldier standing watch, the pilot securing a helmet, and the commander leading troops in the field are all affected by this research. The resulting products transition to Army planners, doctrine, materiel developers, and the Army medical community. They ultimately protect Soldiers, sustain their performance, and provide the "best available" answers for immediate military decision making.

The MOMRP conducts collaborative research with university and commercial laboratories and other federal agencies oriented toward solving critical problems facing the Army today and in the future.

Service- and platform-specific issues are addressed through close coordination with Navy and Air Force counterparts to prevent duplication of effort. The MOMRP uses an independent, external scientific peer review process to ensure the high quality and validity of its research, review milestone accomplishments, and prepare these findings for publication in the open scientific literature.

Current Applications of MOMRP Research

- Stress and psychological resilience research resulted in the Battlemind Training program to help Soldiers prepare for deployment to operational theaters and to transition home from combat
- Altitude physiology research supports Operation Enduring Freedom with operational guidelines to prevent altitude-induced injuries among Soldiers operating in the mountains of Afghanistan
- Injury biodynamics research produced a biomedically valid testing method for body armor blunt trauma performance consisting of a physical model that measures ballistic impact and a web-based prediction model software application
- Environmental toxicology research supports the Global War on Terror with a novel system that continuously monitors drinking water sources for toxic chemicals, protecting both military and civilian communities
- Thermal physiology research supports Operation Iraqi Freedom with vehicle-mounted liquid cooling vest technology that reduces thermal load by linking into HMMWV (Humvee) cooling systems, providing Soldiers with direct under-armor personal cooling

In 1994, the DoD established the Chemical Biological Defense Program, which has the mission to provide chemical and biological defense (CBD) capabilities in support of national military strategies. In support of this mission, USAMRMC laboratories execute medical CBD research programs in partnership with DTRA's JSTO* for Chemical and Biological Defense, which serves as the manager for joint CBD science and technology programs. The JPEO-CBD* is the advanced developer of medical countermeasures directed against chemical and biological warfare (CW and BW) agents.

Medical Biological Defense Research

Vaccines and therapeutic medical countermeasures for biological threat agents are designed to prevent casualties in the event of a BW attack. If exposure and illness do occur, rapid diagnosis is essential for proper treatment and medical management; therefore, field-deployable, rapid assays are being developed for diagnosis of BW agent exposure. Antitoxins are designed to treat casualties, prevent deaths, and expedite the return to duty after exposure.

Smallpox is considered to be a prime candidate for use as a BW weapon, and work continues on improving protection and treatment.

Technologies in or ready for advanced development include a recombinant plague vaccine, a bivalent vaccine against botulinum toxin (subtypes A and B), a vaccine against Venezuelan equine encephalitis (VEE), and a next-generation anthrax vaccine. The anthrax vaccine is being developed by the Department of Health and Human Services under Project BioShield.

Diagnostic assays that meet requirements for application to the Joint Biological Agent Identification and Diagnostic System have also transitioned to the advanced developer.

Several technologies are maturing to the point where they can be considered for transition to the advanced developer including medical diagnostic systems (reagents, assays, protocols, and devices) for BW threats and endemic infectious diseases; a combined VEE, eastern, and western equine encephalitis vaccine; and vaccines against staphylococcal enterotoxin and ricin toxin exposure.

Research is ongoing to develop multiagent vaccines that would afford complete protection to the Warfighter against multiple biological threats with a single vaccine. Research also includes efforts to develop a comprehensive, integrated diagnostic system that combines nucleic-acid-based and immunodiagnostic-based platforms and to fully characterize and evaluate therapeutic medical countermeasures against viral, bacterial, and toxin threats. One effort that has benefited from collaboration between industry, DoD, and the National Institute of Allergy and Infectious Diseases (NIAID) is directed toward the development of therapeutics against variola, the causative agent of smallpox.

Knowledge and expertise gained in executing the medical biological defense science and technology mission are directly applicable to training military and civilian health care professionals in the diagnosis and treatment of BW agent exposure, which is also a Command priority. USAMRMC experts also provide technical support to law enforcement agencies and counterterrorism initiatives.

National Interagency Biodefense Campus (NIBC)

Congress has directed various federal agencies to conduct biodefense research. Co-location of the facilities performing this research is anticipated to increase scientific collaboration among the agencies while decreasing costs as a result of shared infrastructure. The NIBC at Fort Detrick is the campus area designated for the co-location of this research. The NIBC will include laboratory facilities belonging to the DoD, the Department of Homeland Security, and the NIAID and will provide the nation with a much needed biocontainment laboratory space for biological threat characterization and bioforensic research.

***Acronyms**

DTRA: Defense Reduction Threat Agency
JSTO: Joint Science and Technology Office
JPEO: Joint Program Executive Office

Medical Chemical Defense Research

Chemical warfare agents can incapacitate or kill the unprotected Warfighter, causing serious degradation of mission performance. In collaboration with the JPEO-CBD, the USAMRMC has substantially reduced the threat through support for the licensure and fielding of several key medical countermeasures, including:

- Soman Nerve Agent Pretreatment Pyridostigmine, a drug that can be administered orally to troops under risk of soman nerve agent attack without degrading their performance
- Antidote Treatment Nerve Agent Autoinjector provides the Soldier with atropine and an oxime, pralidoxime chloride, in a single injector for treatment against nerve agent exposure
- Convulsant Antidote for Nerve Agent—diazepam in an autoinjector—is used as an adjunct therapy for nerve agent poisoning to protect against seizure-induced brain injury and to enhance survival
- Medical Aerosolized Nerve Agent Antidote consists of aerosolized atropine that can be rapidly administered far-forward to casualties for the control of respiratory effects of nerve agents
- Skin Exposure Reduction Paste Against CW Agents is a topical pretreatment that forms a film barrier on skin and augments mission-oriented protective posture gear by preventing or delaying the penetration of a wide variety of CW agents including the blistering agent sulfur mustard

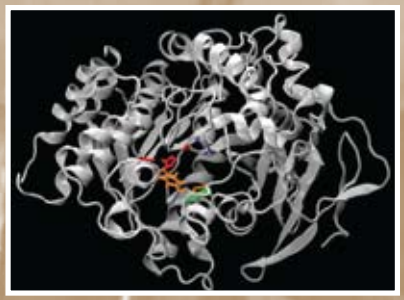
Research and product development supporting pretreatment, treatment, diagnosis, and clinical management of the chemical casualty are key to continuing discovery and fielding of medical countermeasures to CW agents. Successful programs in advanced development and approaching acquisition status include an advanced anticonvulsant system, an improved nerve agent treatment system containing an improved oxime, and the nerve agent bioscavenger Increment I (plasma-derived human butyrylcholinesterase) prophylaxis. This is a stoichiometric bioscavenger, meaning that one molecule of bioscavenger binds and neutralizes one molecule of nerve agent.

Active programs in JSTO's joint technology base include research on the effects of low-level exposure to CW agents, the development of medical countermeasures against vesicants, nerve agent neuroprotection, a recombinant bioscavenger (Increment II), and a catalytic bioscavenger prophylaxis (Increment III) that enhances efficacy by degrading multiple molecules of nerve agents in vivo.

The USAMRMC also provides education and training to officers and enlisted persons from all branches of service who will be the doctors, nurses, and medics who will treat Warfighters exposed to CW agents. The USAMRMC is able to broadcast this information via satellite to first responders around the world who would likely be tending to casualties exposed to CW agents in the event of a terrorist action.

Collaborative Research Program (CRP)

The CRP provides a venue for DoD and non-DoD researchers to conduct operations with controlled chemical threat agents at the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD) at Aberdeen Proving Ground, Maryland. The CRP serves as a center of research excellence devoted to facilitating cooperation across research organizations (government and non-government). A collaborative research facility of over 6,000 square feet of laboratories, offices, and laboratory animal facilities is dedicated to this effort.



Blast Injury Research

The DoD Blast Injury Research Program was directed by Congress in the National Defense Authorization Act for Fiscal Year 2006 and formally established by DoD Directive 6025.21E on July 5, 2006. The Secretary of Defense designated the Secretary of the Army as the Executive Agent for the Program, and through a series of delegations of authority, the Commander, U.S. Army Medical Command (MEDCOM) was assigned Program authority and responsibility. The Commander, MEDCOM established the Blast Injury Research Program Coordinating Office (PCO) at the USAMRMC to carry out the Program's day-to-day research program coordination activities.

The scope of the Program's blast injury focus includes the entire spectrum of injuries that can result from exposure to explosions. These include lung and other internal injuries caused by blast overpressure; penetrating and blunt force injuries caused by strong blast winds; burns and inhalation injuries; and injuries and illnesses resulting from the clinical consequences of "post-detonation environmental contaminants," including bacteria, radiation (dirty bombs), and tissue reactions to fuel.

Since its inception, the PCO has worked hard to identify key blast injury research knowledge gaps, and to coordinate and focus medical research programs across the DoD, other federal agencies, academic institutions, and industry to address these gaps. The value of the PCO's research coordination function is illustrated in the following accomplishments:

- Convened a blast injury research planning meeting with wide representation from the armed services, federal agencies, academia, and industry to identify key blast injury research knowledge gaps
- Developed a blast injury research taxonomy to promote a comprehensive and balanced portfolio of research designed to prevent, mitigate, and treat blast injuries. This taxonomy divides blast injury research programs into three main categories: Injury Prevention, Acute Treatment, and Reset. The term "reset" refers to those activities beyond rehabilitation that are necessary to return injured service members to duty or to productive civilian life.
- Developed and staffed the funding requirements for blast injury research across the DoD for inclusion in the FY10–FY15 Program Objective Memorandum

- Established and managed the Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC) Program, which comprises a partnership among the intelligence, operational, materiel, and medical communities with the common goal to collect, integrate, and analyze injury and operational data
- Strengthened and expanded collaborations among the medical research community and protection equipment developers

One of the focus areas of the new AFIRM is exploring stem cell research and technology to find innovative ways to use a patient's natural cellular structure for reconstruction, explains U.S. Army Surgeon General LTG Eric Schoomaker. Researchers are growing a new ear for a badly burned Marine using stem cells from his own body.

Clinical and Rehabilitative Medicine

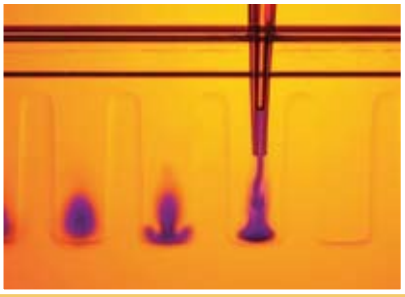
The Clinical and Rehabilitative Medicine (CRM) research program focuses on definitive and rehabilitative care innovations required to reset our wounded warriors, both in terms of duty performance and quality of life.

As part of the effort to address the challenges of caring for the nation's wounded warriors, the DoD has created the Armed Forces Institute of Regenerative Medicine (AFIRM), a virtual organization to include over 20 academic and commercial entities committed to developing clinical therapies and advanced treatment options. The AFIRM focuses on five key areas within regenerative medicine: burn repair; wound healing without scarring; craniofacial reconstruction; limb reconstruction, regeneration, or transplantation; and compartment syndrome, a condition related to inflammation after surgery or injury that can lead to increased pressure, impaired blood flow, nerve damage, and muscle death.

The AFIRM project teams the U.S. Army Institute of Surgical Research (USAISR) with multi-institutional consortia to leverage cutting-edge medical technology to assist service members who have suffered severe, disfiguring wounds during their wartime service. For example, in the area of burns, researchers will pursue treatments including engineered skin products, bio-printing of skin in the field, and repairs using stem cells derived from amniotic fluid. Advances in regenerative medicine could dramatically decrease the amount of time needed to recover from severe injuries that currently require years of treatment and sometimes result in significant lifetime impairment.

Due to advances in trauma care, increasing numbers of service members are surviving with extreme trauma to the extremities. In coordination with the Military Amputee Research Program, this research program looks to capitalize on advancements in neural interfaces, nanotechnology and advancements in prosthetic design to improve foot and knee prosthetics, improve knee prosthetic control, improve haptic feedback, and apply neural interfaces to limb prosthetics. The program will coordinate research into improving clinical practices and strategies with the objective of improving performance of currently available prosthetics.

Establishment of this new Research Area will enable active planning and coordination of an area of military medical research that has grown in importance during the current conflict. Although the initial CRM portfolio will be primarily funded through the many special congressional appropriations typically managed by TATRC and CDMRP, future budget submissions will provide core resourcing within the President's Budget. The Director of the CRM program also provides oversight for all of the Command's congressional special interest programs to enhance their integration with other core research programs.



CSI Research

Funds for congressional special interest medical research programs are not in the president's budget; they are added to the DoD budget by Congress. The USAMRMC has been entrusted by Congress to manage these special research programs, and since 1990, the Command has overseen programs totaling more than $7.4 billion (B). The USAMRMC manages the CSI programs to meet the intent of Congress while ensuring the sponsorship of good science that meets all regulatory requirements and has application to the military and/or civilian sector.

The USAMRMC's Telemedicine and Advanced Technology Research Center (TATRC) manages congressional programs related to existing DoD or Army R&D programs and advanced technology efforts.

Additional CSI medical programs relevant to the military medical R&D mission are managed by the Command Research Area Directorates (RADs) and the U.S. Army Medical Materiel Development Activity (USAMMDA).

The USAMRMC's Office of Congressionally Directed Medical Research Programs (CDMRP) manages extramural grant programs for research specified by Congress as a unique public/private partnership encompassing the military, scientists, disease survivors, advocates, consumers, and policy makers.

The following partial list of congressionally funded programs demonstrates the breadth of research across the spectrum of health care that is managed by the USAMRMC.

TATRC Programs

Military Amputee Research Program

- Improving care for military amputee patients through advancements in clinical management, prosthetic technology, and rehabilitation strategies; epidemiological studies; and database development and management.

Center for Integration of Medicine and Innovative Technologies

- Developing new technologies to diagnose and treat patients using minimally invasive approaches by concentrating on five key clinical focus areas: cardiovascular disease, cancer, stroke, trauma and critical care, and new initiatives.

Percutaneous Delivery of Adipose Derived Therapeutic Cells

- Testing the hypothesis that local delivery of adipocyte-derived stem cells into the lumen of balloon-injured arteries will result in decreased neointima formation.

Advanced Regenerative Medicine Skin Cell Therapies

- Developing novel therapies to regenerate fingertips using extracellular matrix material; repairing and reconstructing injured or missing soft tissues using extracellular matrix as a bioscaffold; and treating severe skin burns via extraction, expansion, and cell support technologies of autologous skin cells from a healthy area of the patient's skin.

Regenerative Medicine Research

- Demonstrating the feasibility of creating vascularized tissues with full motor and sensory capabilities using tissue engineering techniques, which would accelerate wound healing with cosmetic augmentation of the tissue defect and enhance restoration of tissue function.

RAD Programs

MIDRP: Military Human Immunodeficiency Virus (HIV) Research

- Developing HIV vaccines, educating troops, developing a forward diagnostic test, and deploying post-exposure prophylaxis to medical personnel in high-risk zones.

CCCRP: Orthopedic Trauma Research Program

- Complementing, expanding, and broadening the research in orthopedic trauma with emphasis toward improvement of clinical outcomes in combat casualties.

MOMRP: Combat Mental Health Initiative

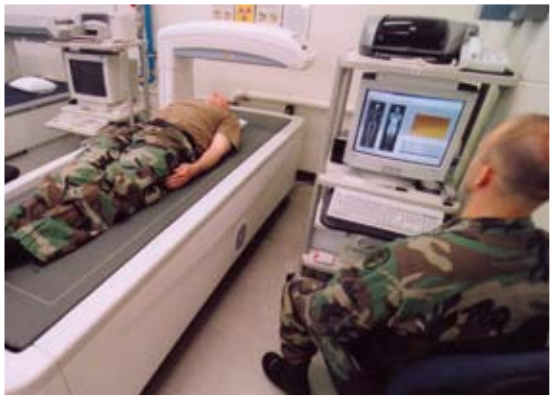
- Studying the relationships between pre-existing mental illness and substance use disorders, deployment to Iraq or Afghanistan, post-deployment mental health, and overall psychosocial adjustment in returning Ohio National Guard troops.

MOMRP: Combat Stress Intervention Program

- Developing an intervention program to address mental health care needs of rural Southwestern Pennsylvania National Guard troops and their families after deployment to Iraq or Afghanistan and training healthcare providers on its implementation.

MOMRP: Bone Health and Military Medical Readiness Research Program

- Exploring regulatory mechanisms involved in normal bone remodeling stimulated by biomechanical forces and developing strategies to prevent stress fractures and optimize bone health against osteoporosis.



MOMRP: Neurotoxin Exposure Treatment Program

- Studying environmental and military operational factors potentially involved in neurodegenerative diseases, with particular emphasis on Parkinson's disease; and identifying potential neuroprotectants and other preventive and treatment strategies.

CB Defense Partnership Support Directorate (PSD): Novel Viral Biowarfare Agent ID and Treatment

- Identifying small molecules that inhibit capsid assembly of viruses of high BW potential to develop effective antivirals and therapeutics for confronting potential biothreats as well as endemic diseases encountered by service members

CB Defense PSD: Alternative Delivery Methods for Recombinant Protein Vaccines

- Investigating novel, minimally invasive and needle-free delivery platforms and associated formulation technologies for the administration of recombinant protein biodefense vaccines that may reduce or eliminate the need for refrigerated or frozen storage and potentially enable polyvalent vaccines to be developed.

USAMMDA Programs

Next Generation HemCon Effort

- Developing a fully absorbable, chitosan-based dressing that military surgeons will be able to safely leave within the chest or abdominal cavity to stop internal bleeding that cannot be controlled with gauze packing or sutures alone.

Lightweight Integrated Trauma Module Effort

- Developing lightweight, integrated en-route care systems to provide critical care monitoring and life support to post-operative patients during transport from the forward surgical hospital back to the combat support hospital.

Office of Congressionally Directed Medical Research Programs

To reduce the incidence of disease and injury, improve survival, and enhance the quality of life for those affected, the CDMRP supports innovative research approaches including neglected and understudied areas of research and disease disparity. Since 1992, the CDMRP has administered over $4.7B in congressional appropriations for research in specific diseases. The intent and recent achievements of several research programs are described below.

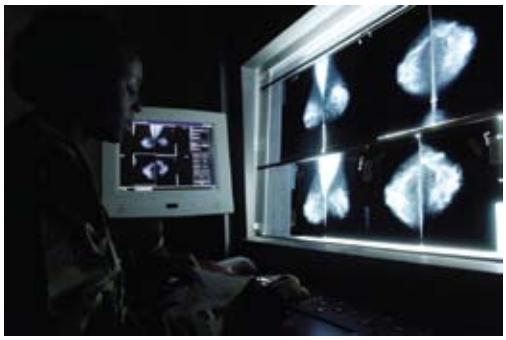
Psychological Health (PH)/ Traumatic Brain Injury Research Program

Responding to the increasing need for new treatments in PH and TBI, fiscal year 2007 (FY07) supplemental DoD funding provided $150 million (M) for post-traumatic stress disorder research and $150M for TBI research. A key priority of the PH/TBI Research Program is to complement ongoing DoD efforts to ensure the health and readiness of our military forces and find new, effective treatments for blast injuries. More than 150 research awards began in 2008 to fund innovative research from individual investigators and also from collaborations and partnerships among the clinical and medical research institutions of academia, the Department of Veterans Affairs, and the DoD.

Peer Reviewed Medical Research Program (PRMRP)

Congress began appropriations in 1999 and has provided over $384M for the PRMRP to support basic, translational, and clinical research that is responsive to the healthcare needs of the Armed Forces and family members, the U.S. veteran population, and the general public. A few examples of products and technologies developed through PRMRP research include:

- A portable, noninvasive system for triage and treatment of shock
- A bovine milk immunoglobulin supplement that prevents traveler's diarrhea



Breast Cancer Research Program (BCRP)

Congress has appropriated more than $2B in research funding for the BCRP since its inception in 1992. The BCRP has made significant strides toward its vision of eradicating breast cancer by funding innovative, high-impact research through a partnership of scientists and consumers. Among its notable accomplishments, the BCRP has:

- Helped develop Herceptin® and Avastin®, therapeutic agents for metastatic breast cancer
- Supported proteomics and genomics to predict individual responses to therapeutic agents, with a clinical trial in progress
- Supported the development of breast cancer-targeting nanoshells, a bio-imaging tool that may be used to detect and destroy breast tumors

Prostate Cancer Research Program (PCRP)

Since 1997, Congress has provided $890M to support prostate cancer research. The PCRP strives toward its goal of conquering prostate cancer by supporting high-impact research, applying special emphasis to clinical and translational advances and health disparities. The program has supported more than 40 clinical trials evaluating devices and interventions in prostate cancer, which include:

- Developing a DNA-based vaccine effective against early-stage prostate cancer
- Evaluating treatment with radioisotope-labeled monoclonal antibody
- Developing designer T-cells to treat patients with advanced prostate cancer

Ovarian Cancer Research Program (OCRP)

From 1997, Congress provided over $121M to support research to detect, diagnose, prevent, and understand ovarian cancer. The OCRP has developed a multidisciplinary portfolio that has:

- Developed monkey, chicken, and mouse research models specific to ovarian cancer that were previously nonexistent
- Established shared registries and tissue repositories with over 9,000 identified ovarian cancer specimens, having associated clinical and laboratory data

Neurofibromatosis Research Program (NFRP)

Beginning in 1996, Congress has appropriated over $190M to support research directed toward the understanding, diagnosis, and treatment of NF1, NF2, and schwannomatosis. The NFRP has:

- Established two natural history studies to understand the progression of NF1 and NF2 mutations
- Established comprehensive and improved mouse models of multiple NF tumor types

Tuberous Sclerosis Complex Research Program (TSCRP)

Since 2002, Congress has provided over $21M for the TSCRP whose vision is to lessen the impact of tuberous sclerosis by encouraging innovative research aimed at understanding the pathogenesis and improving diagnosis and treatment, including:

- Developing a natural history comprehensive clinical database
- Discovering how TSC proteins regulate cells

Gulf War Illness Research Program (GWIRP)

The CDMRP assumed management responsibility for the GWIRP in 2006 followed by additional funding in FY08 totaling $15M. The research awards have focused on:

- Identification of mechanisms underlying Gulf War illness
- Neurological and immunological abnormalities in ill Gulf War veterans
- Identification of promising treatments

Autism Research Program (ARP)

Congressional appropriations began in 2007 and received additional funding in FY08 of $13.9M. The ARP promotes innovative research that advances the understanding of autism spectrum disorder and leads to improved treatment outcomes.

Research Protections

The USAMRMC is committed to adhering to the highest ethical standards in the conduct of DoD-supported research and the protection of human research participants and animals used in research. The USAMRMC Office of Research Protections (ORP) oversees the human subjects and animal protection ethical review of all USAMRMC-funded intramural and extramural research and provides support to other Army and DoD agencies requiring human and animal regulatory review. The ORP is composed of the Human Research Protection Office (HRPO) and the Animal Care and Use Review Office (ACURO).

The HRPO ensures that USAMRMC-managed human subjects research is conducted in accordance with host nation, federal, DoD, and Army requirements. The Human Subjects Research Review Board serves as an Institutional Review Board and as the USAMRMC Commander's advisory board for human subjects protection.

The ACURO implements the Command's animal use policy to ensure humane care and use of laboratory animals and compliance with animal welfare regulations. Animal care and use programs and specific animal use proposals are assessed for how they address the requirements of humane care; minimization of pain and distress; consideration of alternatives to animal use; appropriate use of tranquilizers, analgesics, anesthetics, paralytics, and euthanasia; appropriate pre- and post-surgical veterinary medical care and animal husbandry; psychological well-being of primates; and exercise for dogs.

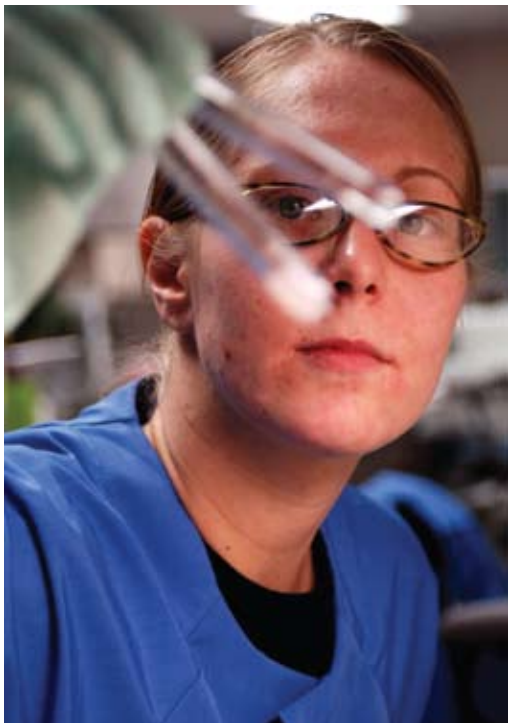
Regulated Activities and Compliance

The Division of Regulated Activities and Compliance (DRAC) serves the Office of The Surgeon General (OTSG) as the sponsor's representative to the U.S. Food and Drug Administration (FDA). The DRAC ensures that USAMRMC medical product development activities fulfill all FDA regulatory requirements including: regulatory training, regulatory filings, clinical monitoring, maintaining the sponsor's regulatory documents, ensuring lifecycle-appropriate compliance of research and manufacturing facilities, and product testing and accountability. The DRAC is composed of a division office and four primary branches: Regulatory, Clinical and Quality, Biostatistics, and Product Technical Operations.

The DRAC also acts as the liaison to the FDA and is responsible for implementing regulatory activities for OTSG-sponsored products. This includes developing regulatory strategies for new product registration and submission to the appropriate regulatory agency and mitigating the regulatory risk to facilitate product development success.

In addition, the DRAC works with other DoD agencies that include Chemical and Biological Medical Systems, DTRA, Navy Medical Research Command, and other partners to ensure regulatory compliance of OTSG-sponsored products.

Quality Management

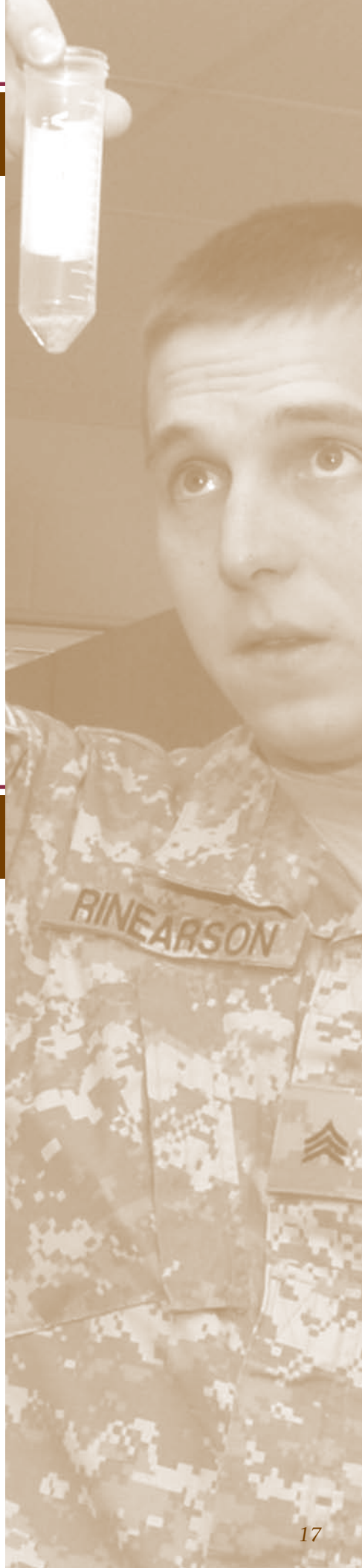


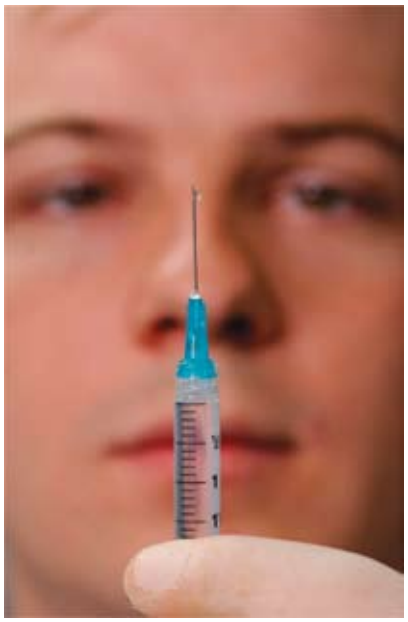
The USAMRMC ensures that the quality and regulatory compliance of vaccine, drug, and device development efforts are being met by defining and implementing quality systems throughout the product development lifecycle with the goal of product licensure by the FDA. The USAMRMC Quality Management Office mission is to improve the operational efficiency and effectiveness within the Command while leveraging customer requirements by ensuring quality planning, compliance, and improvement for research and acquisition activities. Collaboration with counterparts in the OTSG, MEDCOM, subordinate commands, and others ensures successful use of resources and minimizes the impact of redundancy, which allows for an agile but robust regulatory infrastructure necessary for FDA compliance.

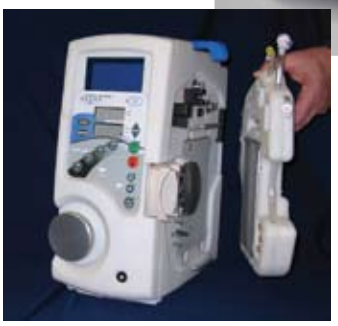
Surety

New biosurety regulations and guidelines were implemented in 2005 because of increased concern for the safety and security of biological select agents and toxins (BSAT) that may be used as weapons of mass destruction. Biosurety is defined as the combination of security, biosafety, agent accountability, and personnel reliability needed to prevent unauthorized access to select agents of bioterrorism.

The USAMRMC Biosurety Office oversees the Command's Biosurety Program, is instrumental in the development of guidelines and implementation of regulations for the Command's four laboratories that possess BSAT, and reviews impacts at USAMRMC research laboratories for medical biological defense for the DoD.







A Portable Handheld Ultrasound (right) and a Thermal Infusion System (below).

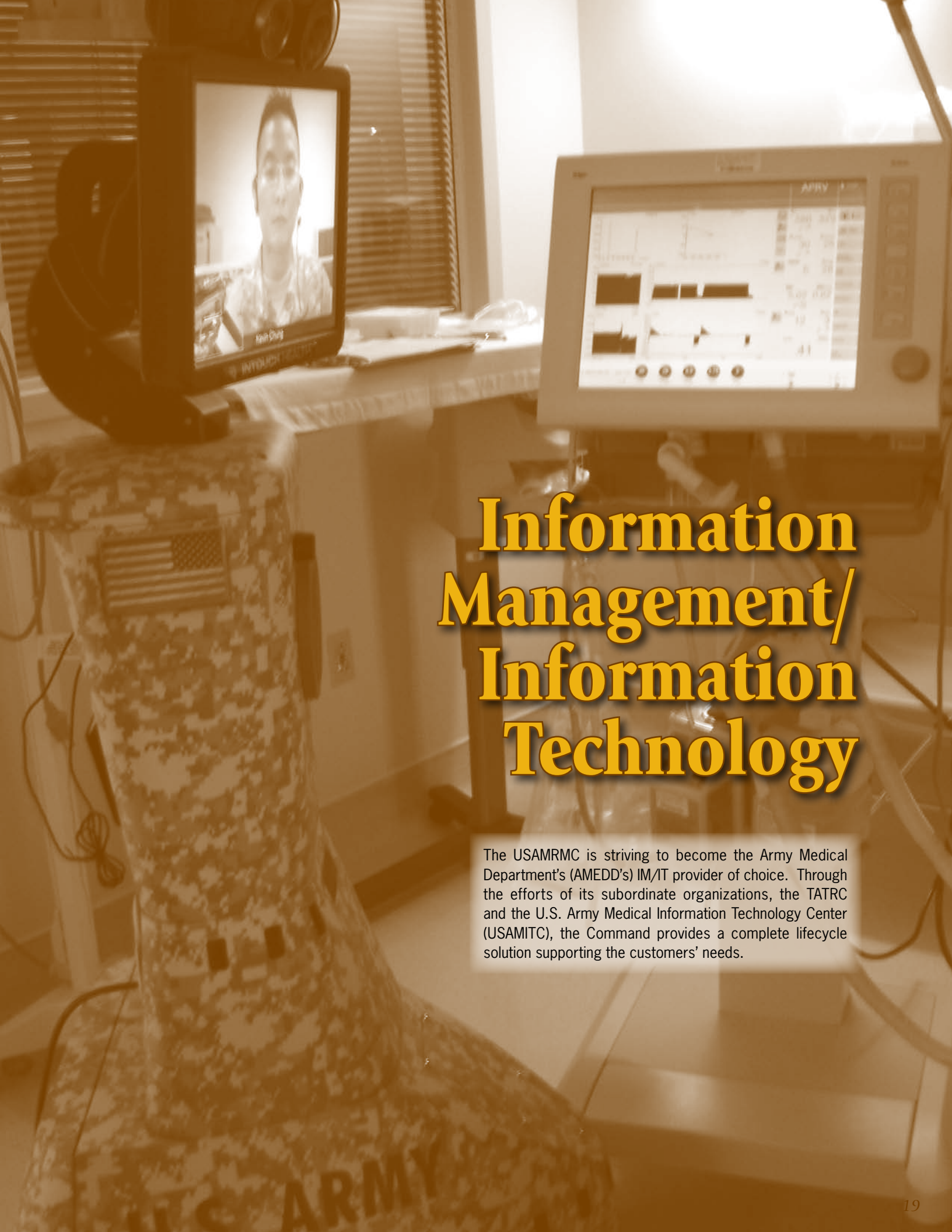
Medical Materiel Acquisition

Over the last decade, the U.S. military has had to meet increased challenges. Military units are deployed around the globe to fight wars and keep the peace. Ensuring our forces are in a state of optimal health and equipped to protect themselves from disease and injury is the job of the USAMRMC. The Command's product line includes vaccines, pharmaceuticals, medical devices, and information technology—a portfolio far more diverse and complex than that of any commercial medical product developer.

The Principal Assistant for Acquisition has the ultimate responsibility of bringing forward to users new medical products, such as improved tourniquets, handheld ultrasounds, and an adenovirus vaccine. Product acquisition is managed by integrating diverse functions and communities, such as users, laboratories, commercial industry, resource management, FDA Regulatory Affairs, and logistics. Ultimately, the office oversees advanced development of products from FDA clinical trials to licensure, and then the follow-on initial production and fielding to ultimate users. It must be emphasized that most USAMRMC products require FDA approval—the final step following years, and in some cases decades, of dedicated research, development, testing, and evaluation by USAMRMC personnel—before an emerging technology becomes a usable product.

While some USAMRMC products are used exclusively in permanent hospitals and clinics, such as Darnell Army Community Hospital in Fort Hood, Texas, or Landstuhl Regional Medical Center in Germany, others are carried directly to the front line by Soldiers and medics. The contributions USAMRMC-developed products make to the health and well-being of Soldiers and their families are inestimable.

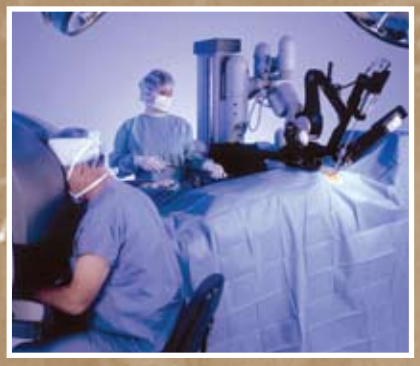
In some cases, USAMRMC uses products that are commercially available; often, however, products are developed from the ground up from technologies only just emerging within USAMRMC laboratories. The broad scope of USAMRMC's product line, the cost and complexity of developing medical products, and the need to deliver medical products on time and on budget make USAMRMC's acquisition management one of the most critical functions in the DoD. Not only do military medical acquisition personnel take into account current Army medical requirements, they also look to the future, evaluate the threat environment, and then provide products that will keep our Soldiers and our homeland safe and secure.



Information Management/ Information Technology

The USAMRMC is striving to become the Army Medical Department's (AMEDD's) IM/IT provider of choice. Through the efforts of its subordinate organizations, the TATRC and the U.S. Army Medical Information Technology Center (USAMITC), the Command provides a complete lifecycle solution supporting the customers' needs.

Telemedicine reflects the convergence of technological advances in a number of fields, including computer and software engineering, telecommunications, space science, materiel science, robotics, artificial intelligence, perceptual psychology, and medicine.



Telemedicine and Advanced Technology Research Center

The TATRC manages congressionally mandated advanced technology projects including the identification, exploration, and demonstration of key technologies that will reduce the medical "footprint" and increase medical mobility, while ensuring Warfighters have access to essential medical expertise and support wherever they deploy.

The TATRC provides short-duration, technical support (as directed) to domestic, federal, and defense agencies; develops, evaluates, and demonstrates new technologies and concepts; and conducts market surveillance with a focus on leveraging emerging technologies in health care. By leveraging its partnerships with industry and academia, the TATRC helps make medical care and services more accessible to Warfighters, reduces costs, and enhances the overall quality of health care in wartime and peacetime.

Advanced Prosthetics & Human Performance

The TATRC has established a growing portfolio of projects aimed at providing advanced prosthetics, orthotics, and other assistive devices, treatments, and interventions for patients with major limb amputations, fractures, and other orthopedic-related injuries. There is significant overlap and collaboration between this portfolio and areas of research such as neural prosthetics, TBI, spinal cord injury, tissue generation, and robotics. Additionally, the TATRC provides funding and management oversight to the U.S. Military Amputee Research Program.

Chronic Disease Management

The Chronic Disease portfolio reflects the use of advanced medical technology primarily in diabetes and heart disease. Current projects highlight the use of telemedicine, home care monitoring, evolving biosensor development, and advanced immunologic testing in vulnerable populations.

Computational Biology

As information technology becomes increasingly important in medical R&D, there is a critical need to advance the state-of-the-art of computer models and simulation by developing bioinformatics/informatics applications capable of analyzing huge quantities of gene and protein data to gain insight into therapy, drug targeting, and diagnosis of biological threats.

Health Information Technologies

The Advanced Information Technology Group oversees all health informatics-related programs within the TATRC and is designated as the IM/IT research arm for the Military Health System (MHS) Joint Medical Information Program Office.

Medical Imaging Technologies

A total of 66 unique, active projects are divided into four distinct research areas: portable imaging and image-guided therapeutics, advanced high-performance imaging, computational methods and decision support in imaging, and optical/para-optical imaging techniques. The TATRC also finds opportunities to combine advanced technologies in other fields of research, such as the combination of Proton Beam Radiation Therapy with Advanced Robotic Guidance and the fusing of optical technologies with neuroprothetics.

Medical Logistics

The TATRC is dedicated to advancing medical logistics via conceptualization and execution of state-of-the-art prototype devices that are modular in concept and multifunctional/multi-procedural in capability for implementation across the spectrum of care within the DoD. The portfolio focuses on potentially transformational technologies to be applied to core logistics systems and processes used to support operational medicine.

Medical Robotics Portfolio

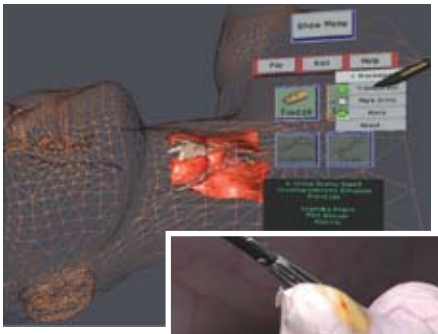
Projects are aimed at adapting, integrating, or developing robotic technologies to treat patients in fixed and mobile medical facilities and to locate, identify, assess, treat, and rescue battlefield casualties under hostile conditions. Examples include the Operating Room of the Future portfolio consisting of the Periscopic Spine Surgery project, the "Penelope" Robotic Scrub Nurse, surgical robotic systems, and the Trauma Pod program. Other projects include robotic detection of biological and chemical agents and Improvised Explosive Devices and casualty recovery.

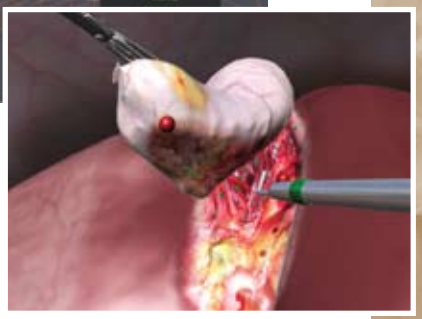
Biomonitoring Technologies

Advances in science and engineering have enabled gathering of medical and environmental information through sensors and diagnostic tools and transmission of data through wireless technologies. The next step is to take advantage of these advancements by integrating various technologies and incorporating computer algorithms to develop decision support tools that will improve medical treatments, enhance first response, and mitigate risks.

Nano-Medicine & Biomaterials

A diverse portfolio ranges from new nanomaterial-based contrast agents for cardiac and brain imaging to novel drug delivery systems for the treatment of cancer. Projects also focus on identifying novel developments in materials science and biomaterials that can improve drugs and devices for diagnosis and therapy of a broad range of medical conditions. Fabrication of materials with properties that mimic tissue are also under development; these biomimetic materials encourage the growth of cells, the integration of bone into implants, and the regeneration of tissue after traumatic injury.



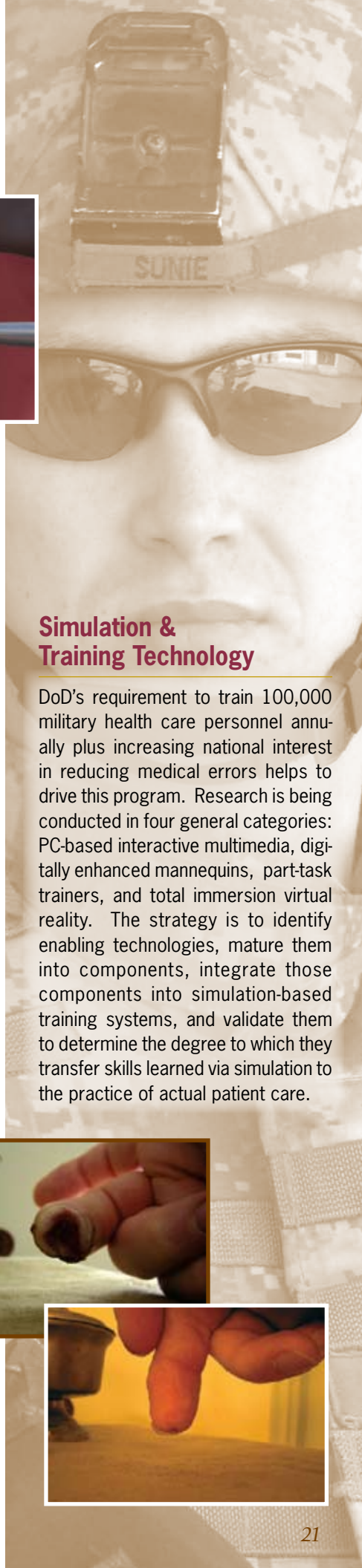


Neuroscience

Given the rapid growth in this arena and the importance of traumatic brain injury and post-traumatic stress, a new research portfolio was created to optimize the management of these projects. Also, due to the breadth of technologies involved in neuroscience research, many new projects in other portfolios have been linked to the neuroscience portfolio, specifically in advanced imaging and simulation and training technologies. Research foci of the portfolio include CSI projects addressing brain machine interface and neuromodulation, basic science assessment for biomarkers of TBI, assessment of potential drug therapies for TBI, development of a neurotrauma registry, regenerative medicine studies for spinal cord injury therapies, clinical assessments of the standard of care of spinal cord injury and future therapeutic trials, and assessment of the problem of cerebral vasospasm after blast injury.

Regenerative Medicine

Regenerative medicine encompasses many novel approaches for the treatment of damaged tissues and organs by using therapies that prompt the body to autonomously regenerate, and by using autologous cells from the patient's body to seed on biodegradable scaffolds for the creation of engineered organs for therapy. Projects within this portfolio seek to advance the sciences and technologies in tissue engineering and stem cell research to help replace or re-grow lost, damaged, or diseased tissues, organs, or limbs. This also includes projects that seek to improve wound healing and/or to repair damaged tissues through the use of cell therapy and/or gene therapy.



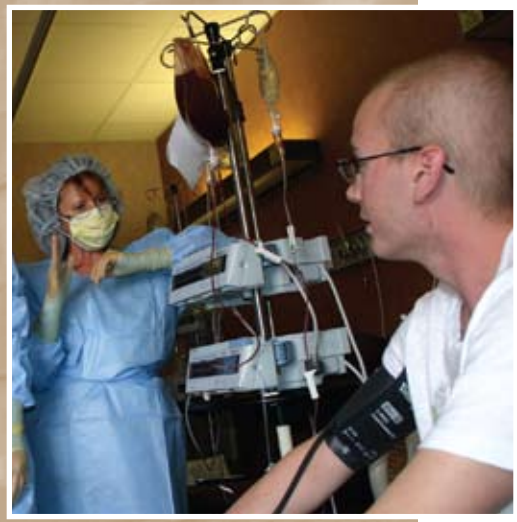
Simulation & Training Technology

DoD's requirement to train 100,000 military health care personnel annually plus increasing national interest in reducing medical errors helps to drive this program. Research is being conducted in four general categories: PC-based interactive multimedia, digitally enhanced mannequins, part-task trainers, and total immersion virtual reality. The strategy is to identify enabling technologies, mature them into components, integrate those components into simulation-based training systems, and validate them to determine the degree to which they transfer skills learned via simulation to the practice of actual patient care.

Enabling health care through technology...

U.S. Army Medical Information Technology Center

The USAMRMC's IM/IT program is executed by USAMITC, located at Fort Sam Houston, Texas. The USAMITC is a matrixed organization, which allows it to rapidly assemble teams of experts to satisfy customer requirements. From systems development and network engineering to enterprise systems management and services, the USAMITC operates in all phases of the acquisition lifecycle to accomplish its mission—to implement and sustain an integrated and protected medical information enterprise for the MEDCOM and ensure that Warfighters, their families, and all of their beneficiaries receive the highest quality health care.

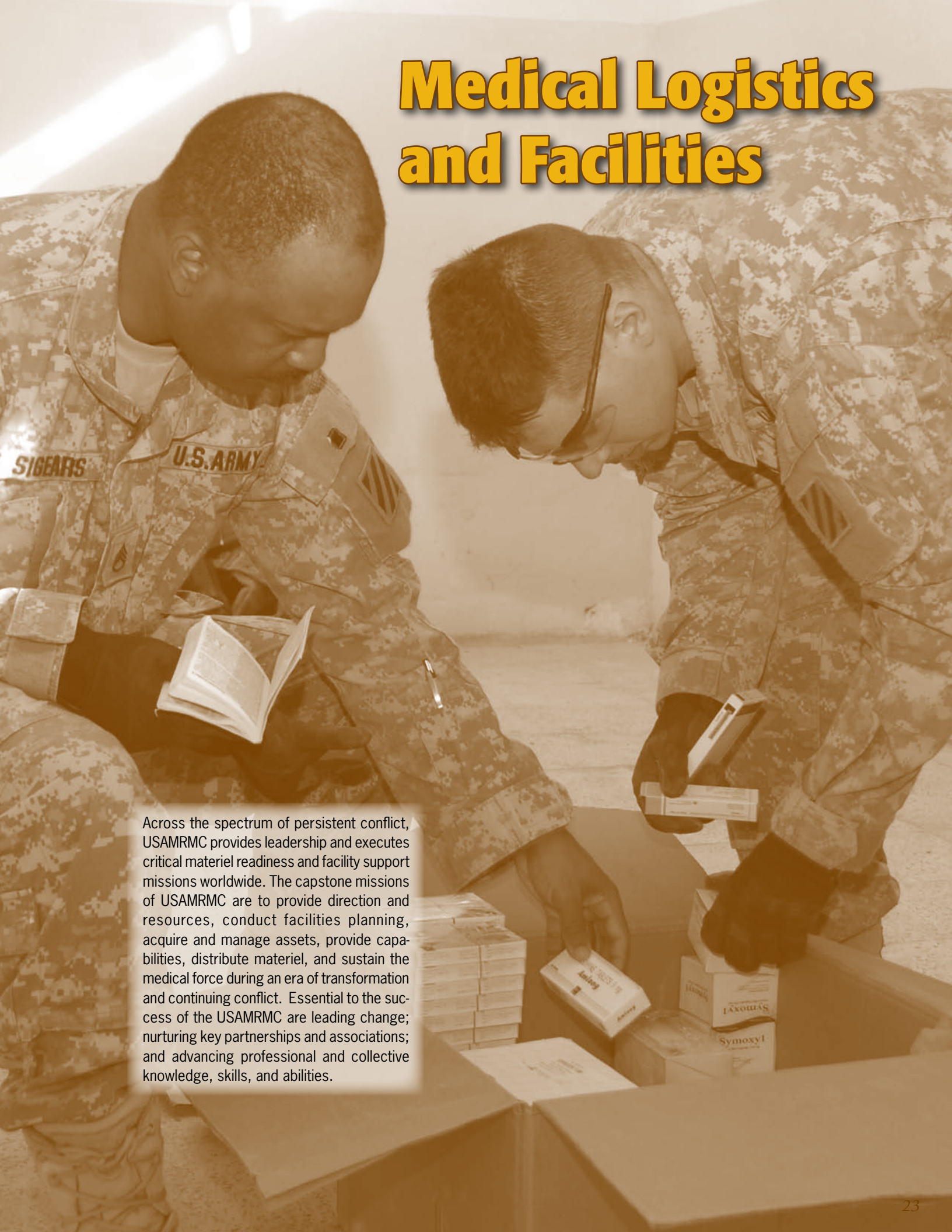


The path to the future medical force is being paved with IM/IT capabilities, and the USAMITC is executing an enterprise IM/IT strategy that is modernizing and improving Army medicine. As the joint medical community moves toward the information sharing and IM/IT standardization across the services, the USAMITC is working on solutions to meet the joint medical mission.

The USAMITC enables health care by providing quality IM/IT products and services requested by the AMEDD. The Center has three key functions:

- **IM/IT Enterprise Management:** The USAMITC provides the infrastructure for a single Army medical network operating environment that enables corporate information sharing and centralized management.
- **Product Development and Management:** The USAMITC designs, develops, deploys, and sustains IM/IT systems. Product management professionals and IM/IT engineers have extensive experience to cover the lifecycle of IM/IT capabilities, and they research, evaluate, and integrate leading-edge technology to help customers solve their IM/IT challenges.
- **IM/IT Operations and Support:** The USAMITC support services are crosscutting. Various teams work proactively to ensure that the technology solutions the Command develops, monitors, manages, and sustains enable worldwide communications to flow efficiently, seamlessly, and securely.

Medical Logistics and Facilities



Across the spectrum of persistent conflict, USAMRMC provides leadership and executes critical materiel readiness and facility support missions worldwide. The capstone missions of USAMRMC are to provide direction and resources, conduct facilities planning, acquire and manage assets, provide capabilities, distribute materiel, and sustain the medical force during an era of transformation and continuing conflict. Essential to the success of the USAMRMC are leading change; nurturing key partnerships and associations; and advancing professional and collective knowledge, skills, and abilities.

The Command is committed to ensuring that world-class health care providers have what they need to deliver the required medical support to our nation's Warfighters.

Major responsibilities for the dynamic and diverse Command focus on several acquisition logistics and materiel readiness competencies:

- Oversee materiel acquisition and logistics functions within the ensemble medical research, development, and acquisition practices supporting product and system lifecycle management
- Plan and execute strategic, centrally managed programs that promote medical materiel readiness and sustainment of the medical force
- Conduct operational logistics within the supply chain to include single integrated medical logistics management and theater lead agent management for Supply Class VIII (medical) functions
- Plan, modernize, and deliver technology improvements as part of lifecycle management for Army medical treatment facilities and health facility programs

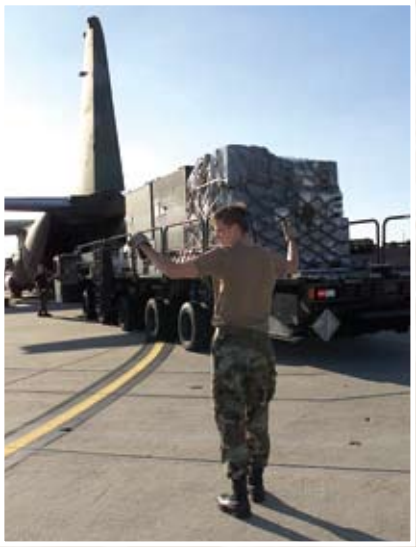
The USAMRMC performs its critical materiel missions across these major Army processes: force management, force projection, and force sustainment.

As part of its role in force management, the Command collaborates on force design updates, maintenance planning, and materiel set management, as well as resource planning, programming, budgeting, and execution processes. Key functions include technology watch, materiel development, acquisition logistics, materiel distribution, and sustainment.

Fundamental to this role are materiel assessment, procurement, medical maintenance, materiel fielding and transfer, and follow-on support for improved or new medical equipment, organizations, and medical facilities. These activities support the MHS as well as Army Campaign plan, especially Army Force Generation resetting and sustaining of the medical force.

In the realm of force projection, the USAMRMC centrally manages several Army and OTSG readiness programs. These programs include the acquisition, storage, distribution, and transfer of pre-positioned stocks located ashore and afloat, as well as medical chemical defense packages, short shelf-life pharmaceuticals, and other materiel. Integral to this support are partnerships with defense organizations and industry. The Command also supports deployable medical logistics support teams.

Within the area of force sustainment, the Command elements are constantly exploring and employing innovative methods to implement enterprise systems that meld best practices with automated information and communication technologies. These transformation initiatives are intended to achieve more effective and efficient ways to deliver and manage medical materiel and facilities capabilities in support of AMEDD missions.



As part of the greater USAMRMC medical logistics enterprise, the U.S. Army Medical Materiel Agency (USAMMA) serves as the strategic-level organization in support of the MHS and Army Campaign Plan by managing select medical materiel lifecycle projects; equipping, sustaining, and transforming the medical force; and managing Army and OTSG centralized programs. The agency's mission is to provide optimal medical acquisition and logistics support and solutions across the full spectrum of military health care missions worldwide. Integral to this mission is developing and implementing innovative logistics concepts and technologies, enhancing materiel lifecycle management, and advancing materiel readiness. Moreover, the agency interrelates with facets of the Defense Logistics Agency, Army Materiel Command, Combatant Commands, and Army Service Component Commands, as well as other Direct Reporting Units and federal and State government institutions. The USAMMA vision is to ensure that every provider can deliver the health care expected by the nation, joint Warfighters, and partners.

The U.S. Army Medical Materiel Center–Europe (USAMMCE) provides joint medical logistics support to the Army, Navy, Air Force, and Marine Corps component commands throughout the U.S. European Command (EUCOM) and the U.S. Central Command (CENTCOM) areas of operations. USAMMCE also supports the Department of State embassies in Europe, throughout the Middle East, and in Africa, as well as the Department of State Humanitarian Assistance Program.

The U.S. Army Health Facility Planning Agency (USAHFPA) oversees the acquisition and lifecycle management of medical treatment and research facility replacement, renewal, and contingency projects. This requires involvement from a project's inception, including programming and strategic planning, through design and construction, into final occupancy. USAHFPA consists of deployable experts in the planning, programming, design, construction, and transition of medical, dental, veterinary, research, and health specialty facilities. The USAHFPA provides assistance in assessing and refining facility requirements of the AMEDD and other customers and then executes design and construction investments whenever and wherever needed.

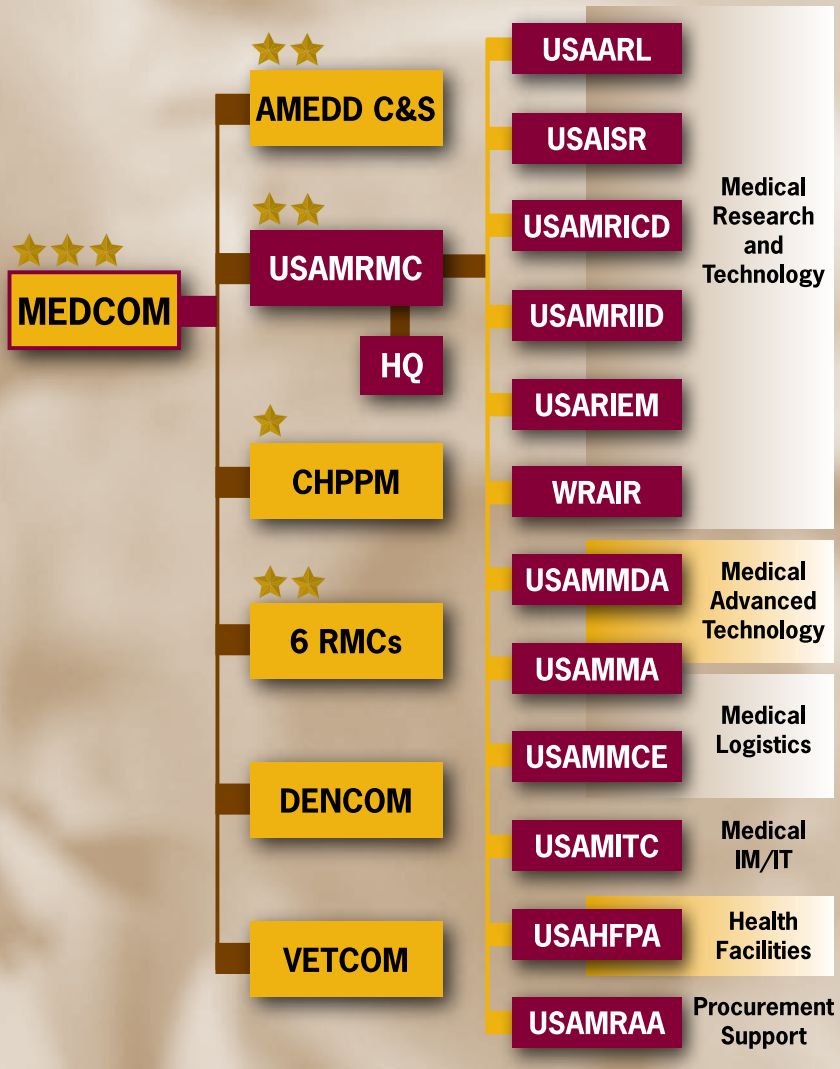
The USAHFPA has successfully managed more than $4B in facility solutions for the institutional AMEDD and has deployed its technical expertise to support more than 58 disaster-relief, peacekeeping, nation-building, and medical support and stability operations for U.S. partner nations and our combatant commanders around the world.

A groundbreaking ceremony was held in June 2006 for the new National Biodefense Analysis and Countermeasures Center, part of Fort Detrick's upcoming National Interagency Biodefense Campus.

USAMRMC Organizations

Located throughout the United States and overseas, the USAMRMC consists of the HQ, six research laboratories or institutes, and six management organizations (plus CDMRP and TATRC). In addition, the Walter Reed Army Institute of Research (WRAIR) manages two separate detachments (USAMRD and USADTRD) and three overseas laboratories (AFRIMS, USAMRU-E, and USAMRU-K). A third detachment (USACEHR) is overseen by the U.S. Army Medical Research Institute of Chemical Defense.*

Overall, approximately 5,200 military, civilian, and contractor personnel are assigned to support the HQ and subordinate units. Officers, enlisted Soldiers, and civilians—many of whom are among the most respected and knowledgeable specialists in their fields—provide subject matter expertise in medical, scientific, and technical areas throughout the Command.



***Detachments and Overseas Laboratories**

AFRIMS: Armed Forces Research Institute of Medical Sciences
USACEHR: U.S. Army Center for Environmental Health Research
USADTRD: U.S. Army Dental and Trauma Research Detachment
USAMRD: U.S. Army Medical Research Detachment
USAMRU-E: U.S. Army Medical Research Unit-Europe
USAMRU-K: U.S. Army Medical Research Unit-Kenya

Other Acronyms

AMEDD C&S: AMEDD Center & School
CHPPM: U.S. Army Center for Health Promotion and Preventive Medicine
DENCOM: U.S. Army Dental Command
RMCs: Regional Medical Commands
VETCOM: U.S. Army Veterinary Command

USAARL

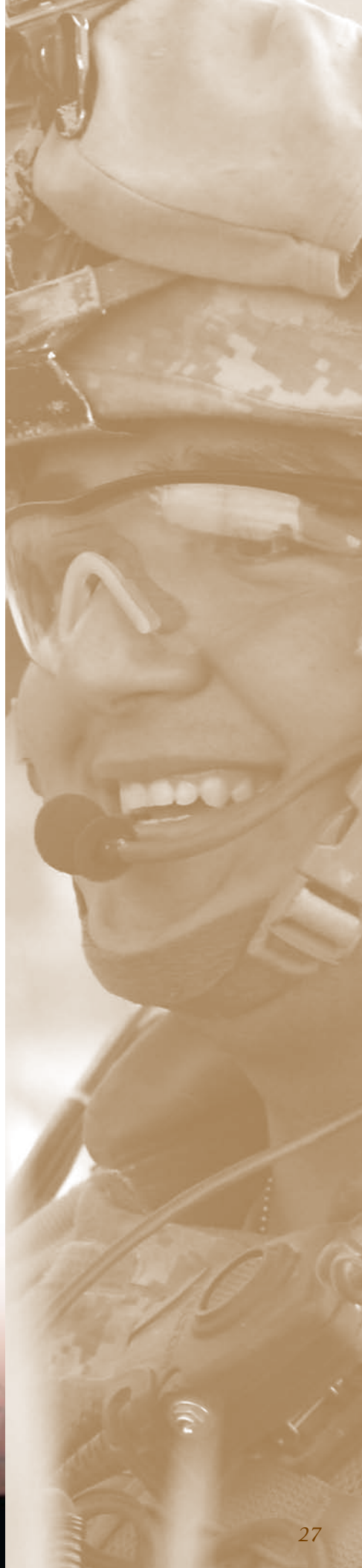
U.S. Army Aeromedical Research Laboratory

The USAARL at Fort Rucker, Alabama, is a nationally recognized Center of Excellence for research into Soldier safety, survival, impact tolerance, sustainability, and performance effectiveness in the mounted environment. Its JUH-60A Black Hawk aircraft is a unique aviation medicine resource. Though USAARL's legacy was forged in Army aviation, its present research program uses equipment such as the multi-axis ride simulator to focus on increased force effectiveness and safety in mounted and dismounted operations with land-based tactical vehicles and weapons platforms. The USAARL has state-of-the-art research capabilities in the areas of acoustics, vision, repetitive impact, crash survival, and life support systems, and its full-motion NUH-60FS Black Hawk flight simulator and 8-bed sleep lab are unrivaled for investigating management of crew workload, stress, and fatigue.

USAISR

U.S. Army Institute of Surgical Research

The USAISR, located at Brooke Army Medical Center at Fort Sam Houston, Texas, is renowned as the only DoD Burn Center and is recognized worldwide for its advanced level of care to critically burned Soldiers, Sailors, Marines, and Airmen, as well as support to the civilian community. The USAISR has an equally important research mission to provide medical solutions and products across the full spectrum of combat casualty care, from far-forward self-care and buddy care through evacuation, to definitive military medical treatment and return to duty. Focused areas of research include hemorrhage control, resuscitation, orthopedic injuries, and soft tissue injuries to include burns, pain management, bone regeneration, clinical trauma, and trauma informatics. The USAISR is the future home of the Joint Center of Excellence for Battlefield Health and Trauma Research. The 2005 Base Realignment and Closure Commission's decision will consolidate combat casualty care research for the Army and Navy in one location to facilitate the development of joint solutions. The new facility is expected to open in September 2009.



USAMRICD

U.S. Army Medical Research Institute of Chemical Defense

Located at Aberdeen Proving Ground, Maryland, the USAMRICD is the DoD's lead laboratory for development of medical countermeasures against CW agents. Medical countermeasures developed at the USAMRICD protect the Warfighter through antidote therapy, topical skin protectant barriers, pretreatment measures, and improved management of casualties through treatment regimens that reverse or reduce the toxicity of chemical agents. The USAMRICD is also responsible for training health professionals in the medical management of chemical casualties. The Chemical Casualty Care Division conducts classroom courses, field training exercises, satellite broadcasts, and numerous training products for distance learning (see https://ccc.apgea.army.mil).

The *U.S. Army Center for Environmental Health Research*, Fort Detrick, Maryland, a detachment of the USAMRICD, directs and conducts research, development, testing, and validation for the medical aspects of environmental surveillance and environmental health in support of medical force protection.

USAMRIID

U.S. Army Medical Research Institute of Infectious Diseases

The USAMRIID, Fort Detrick, Maryland, conducts basic and applied research on biological threats resulting in medical solutions to protect military service members. The USAMRIID is the lead medical research laboratory for the U.S. Biological Defense Research Program. The institute plays a key role as the only laboratory in the DoD equipped to safely study highly hazardous infectious agents requiring maximum containment at biosafety level 4. As the Center of Excellence for DoD medical biological defense research, the USAMRIID's challenge is to maintain its world-class scientific and technology base while being responsive to its primary customer—the Warfighter. While the USAMRIID's primary focus is on protecting military service members, its research has applications that benefit the civilian population at large. The institute's unique science and technology base serves not only to address current threats to U.S. Armed Forces but is also an essential element in the medical response to any future biological threats that may confront the nation.

USARIEM

U.S. Army Research Institute of Environmental Medicine

The USARIEM is the DoD's premier institution for environmental and exercise physiology research. Located in Natick, Massachusetts, the USARIEM functions as a world-class laboratory for environmental medicine, physiology, performance, and nutrition research to protect, sustain, and enhance Warfighter health and performance. The institute performs basic and applied research in environmental physiology and occupational medicine with a focus on human performance optimization. The USARIEM conducts research in thermal and mountain medicine, military performance, military nutrition, and biophysics and biomedical modeling. By leveraging its unique capabilities and facilities with industry, academia, and government, the USARIEM produces a variety of important products, including: performance optimization doctrine, preventive medicine and planning doctrine, materiel development support, physiological monitoring strategies and predictive algorithms, and health hazard assessments.

WRAIR

Walter Reed Army Institute of Research

The WRAIR, Forest Glen, Maryland, is the oldest (1893), largest, and most diverse laboratory of the USAMRMC. Its mission is to counter threats from naturally occurring infectious diseases, high energy and trauma, stress and sleep deprivation, and biological and chemical warfare agents. Housed in a new, state-of-the-art laboratory facility and co-located with the Naval Medical Research Center, the WRAIR provides unique research capabilities, including sleep suites; an insectary to produce vectors of militarily important diseases such as malaria, dengue fever, and leishmaniasis; biosafety level 3 laboratories; a clinical trial facility for conducting human challenge studies; and a Good Manufacturing Practice-compliant bioproduction facility.

In addition, the WRAIR manages collocated research programs in laser/microwave bioeffects *(U.S. Army Medical Research Detachment)* and combat dentistry *(U.S. Army Dental and Trauma Research Detachment)*. The WRAIR also operates overseas research units in Thailand, Kenya, and Germany.

USAMMDA

U.S. Army Medical Materiel Development Activity

The USAMMDA's mission is to protect and preserve the lives of America's sons and daughters by developing new drugs, vaccines, and medical devices that enhance readiness, ensure the provision of the highest quality medical care to the DoD, and maximize survival of medical casualties on the battlefield. USAMMDA product managers take promising new concepts and technologies developed in our laboratories, guide them through the regulatory maze to obtain FDA certification, and develop plans for fielding in conjunction with the USAMMA.

USAMMA

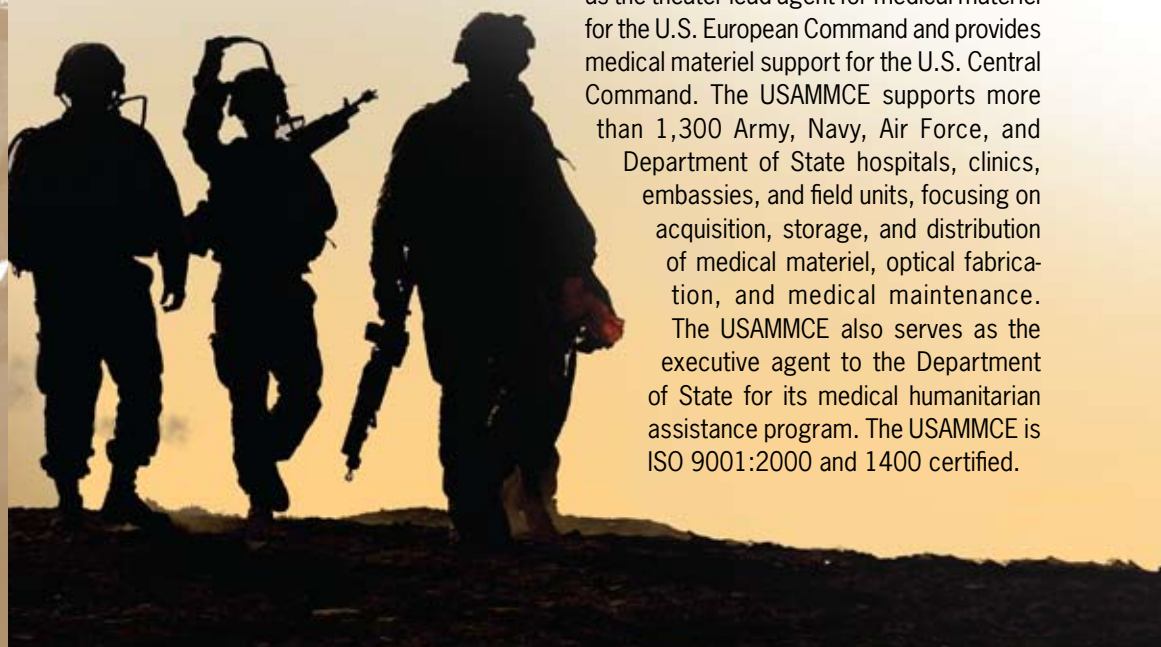
U.S. Army Medical Materiel Agency

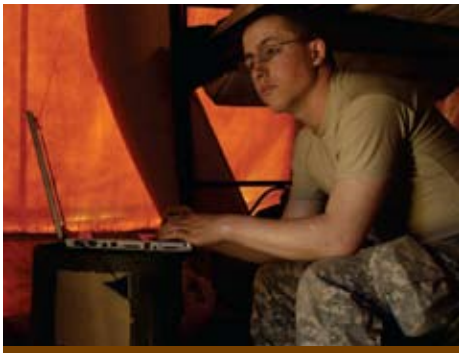
The USAMMA has its headquarters at Fort Detrick, Maryland, with forward sites and maintenance operations in various locations in the United States and overseas. The USAMMA has myriad strategic roles involving centrally managed medical logistics programs, materiel acquisition and supporting functions, Army Supply Class VIII (Medical) set builds and cataloging, Command Fielder, maintenance planning and operations, and Army Force Generation integration and synchronization. USAMMA's vision is to take full measures that ensure every provider can deliver the health care expected by the nation, joint Warfighters, and partners.

USAMMCE

U.S. Army Medical Materiel Center–Europe

The USAMMCE, Pirmasens, Germany, serves as the theater lead agent for medical materiel for the U.S. European Command and provides medical materiel support for the U.S. Central Command. The USAMMCE supports more than 1,300 Army, Navy, Air Force, and Department of State hospitals, clinics, embassies, and field units, focusing on acquisition, storage, and distribution of medical materiel, optical fabrication, and medical maintenance. The USAMMCE also serves as the executive agent to the Department of State for its medical humanitarian assistance program. The USAMMCE is ISO 9001:2000 and 1400 certified.





USAMITC

U.S. Army Medical Information Technology Center

The USAMITC provides IM/IT products and services to support the AMEDD, MHS, DoD, and other government clients. The USAMITC is also the operational arm for the Army Surgeon General in executing corporate IM/IT strategy and managing corporate IM/IT infrastructure and is the AMEDD's single enterprise IT service provider.

USAHFPA

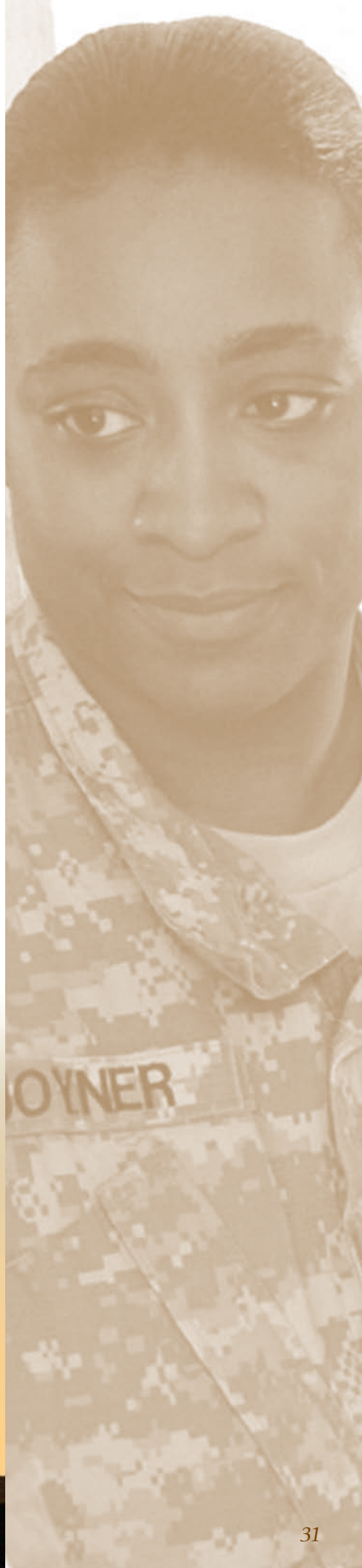
U.S. Army Health Facility Planning Agency

The USAHFPA, Falls Church, Virginia, is the USAMRMC's operational command that supports planning and execution of AMEDD facility lifecycle management worldwide. As the Army MEDCOM's deployable experts in planning, programming, design, construction, and transition of facilities, the USAHFPA assists AMEDD and other customers in assessing and refining their facility requirements and then executes design and construction investments whenever and wherever needed. The agency also deploys its expertise globally as one of the MEDCOM's Special Medical Augmentation Response Teams–Health Systems in support of war, operations other than war, peacekeeping, nation building, and disaster relief.

USAMRAA

U.S. Army Medical Research Acquisition Activity

The USAMRAA crafts both Federal Acquisition Regulation-compliant contracts and assistance agreements (grants and cooperative agreements) in support of the USAMRMC and its many subordinate activities. These documents are used to obligate funds and acquire services from the commercial market, such as research staff, scientific effort, advance development support, medical products, logistics support, and supplies/equipment in support of the Command's overall mission. This mission encompasses over $2B and more than 21,000 transactions annually. Additionally, the USAMRAA provides contractual business advice to Command elements and assistance with ISO certification upon request.



Protect ◆ Project ◆ Sustain

Medical research and materiel are critical to maintaining trained and ready armed services capable of rapid deployment and decisive victory. Future battlefields will continue to present life-threatening dangers and unknown challenges and threats as technology evolves. Our forces must be prepared to fight regional wars in any climate or geographic region against adversaries equipped with the most modern and powerful weapons. We must be able to rapidly adapt and develop counter-measures to any new barriers that put our Soldiers' health and performance in jeopardy. Medical treatments must continue to improve to hasten return to duty and ensure the quality of life of our wounded soldiers.

No one knows precisely what dangers we will face in the next conflict, but history suggests that victory will depend heavily on the presence of a superior medical technology base that can respond quickly with required countermeasures to emerging health threats. The USAMRMC provides the expertise to meet the challenges of the future battlefield.

COMMAND ORGANIZATIONS

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