Army Science & Technology

NDIA Science Engineering & Technology Conference

Medical Portfolio Overview

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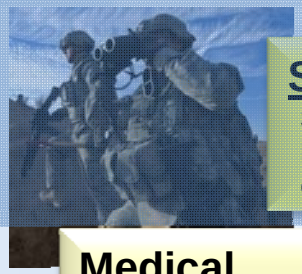
DESIGN • DEVELOP • DELIVER • DOMINATE
SOLDIERS AS THE DECISIVE EDGE

Army Enduring Challenges

- Greater ***force protection (Soldier, vehicle, base)*** to ensure survivability across all operations
- Ease ***overburdened*** Soldiers in Small Units
- Timely ***mission command & tactical intelligence*** to provide situation awareness and communications in <u>all</u> environments
- Reduce logistic burden of ***storing, transporting, distributing*** and ***retrograde*** of materials
- Create ***operational overmatch*** (enhanced lethality and accuracy)
- Achieve operational ***maneuverability*** in all environments and at ***high operational tempo***
- Enable ability to ***operate in CBRNE environment***
- Enable ***early detection*** *and* ***improved outcomes for Traumatic Brain Injury (TBI) and Post Traumatic Stress Disorder (PTSD)***
- Improve ***operational energy***
- Improve ***individual & team training***
- ***Reduce lifecycle cost*** of future Army capabilities

Army S&T Investments by Portfolio

PB15 FY15 6.1-6.3



Soldier/Squad

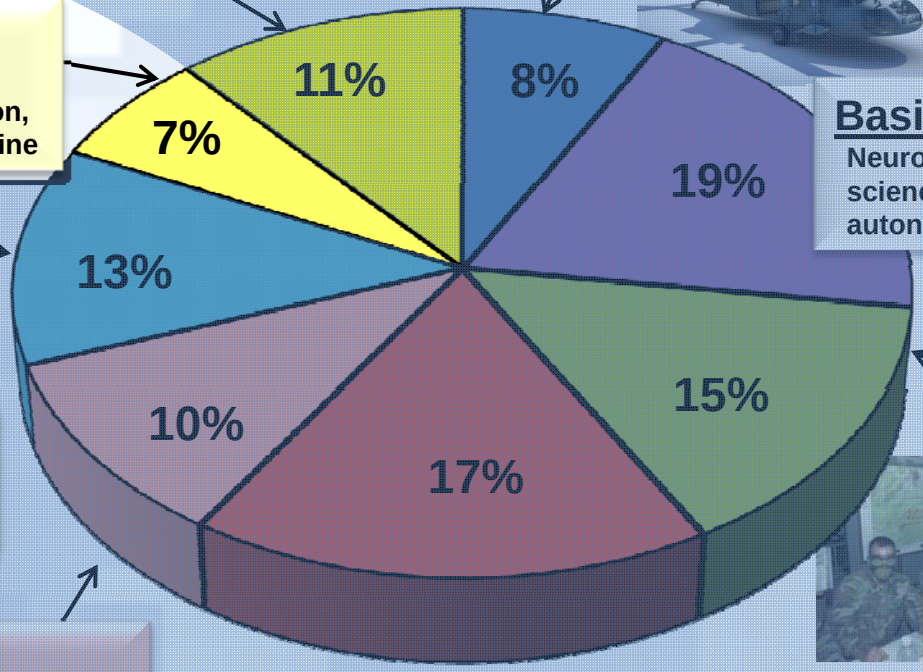
Soldier survivability equipment; human dimension/systems; power & energy; Soldier Weapons, training

Air

Advanced air vehicles; unmanned aerial systems; manned/unmanned teaming

Medical

Combat Casualty Care, Infectious Disease mitigation, clinical/rehabilitative medicine



Basic Research

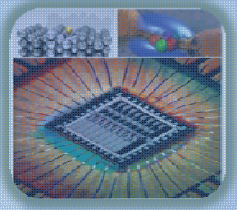
Neuroscience; network science, materials science; autonomy

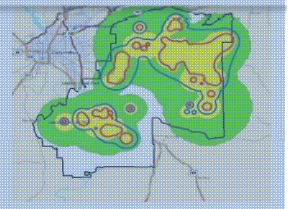
Innovation Enablers

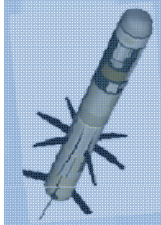
High Performance Computing; Environmental Protection; Base Protection; Studies

C3I

Secure Comms-on-the-move; cyber/EW; sensors

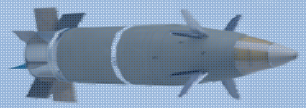






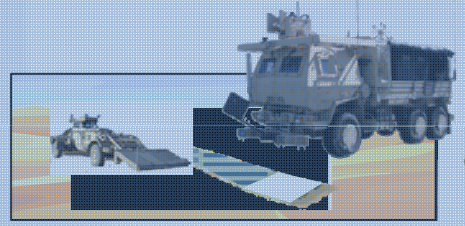
Lethality

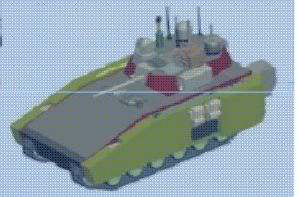
Offensive/Defensive kinetic (guns, missiles) > 50 cal; Directed Energy (HEL) weapons



Ground Maneuver

Combat/tactical ground platforms/survivability; unmanned ground systems; austere entry; power & energy





Note: Figures may not add due to rounding

Medical Vision Statement

Vision

Lead the advancement of Army medical science and technology

Responding to Threats to Service Member Health and Performance

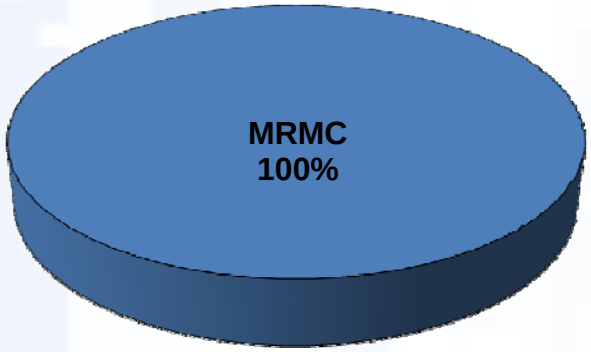
FY15

Medical Portfolio

Medical Portfolio

6.2 and 6.3 Funding

$143M



Systems Biology	Military Operational Medicine	Infectious Diseases	Combat Casualty Care	Clinical and Rehabilitative Medicine
$5M	$57M	$36M	$27M	$18M

Investment Areas

- Computational Medical Modeling
- Systems Biology Enterprise

Investment Areas

- Physiological Health
- Injury Prevention and Reduction
- Psychological Health & Resilience
- Environmental Health & Protection

Investment Areas

- Bacterial Diseases
- Viral Diseases
- Parasitic Diseases
- Human Diagnostics
- Vector Control & Diagnostics

Investment Areas

- Hemorrhage Control, Resuscitation & Blood Products
- Diagnosis/Treatment of Brain Injury
- Forward Surgical/ Intensive Care and En Route Care
- Treatments for Tissue Injury

Investment Areas

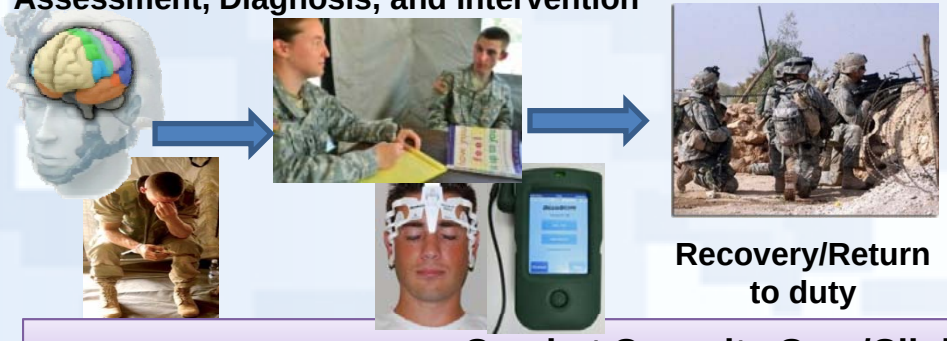
- Regenerative Medicine / Maxillofacial Restoration
- Vision

Medical Major Efforts

Psychological Health & Resilience and Traumatic Brain Injury (TBI)

Goal: Develop interventions to prevent and reduce combat-related behavioral health problems and cognitive deficits associated with PTSD and TBI, including depression, anger problems, post-concussive symptoms, and other health risk behaviors; develop faster treatments to alleviate symptoms.

Assessment, Diagnosis, and Intervention



Recovery/Return to duty

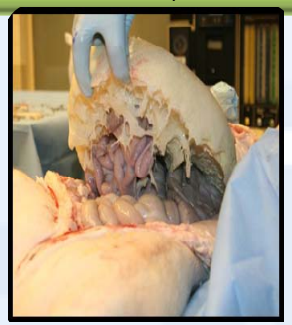
Infectious Diseases (Drugs & Vaccines)

Goal: Develop methods to prevent, treat, and/or diagnose naturally occurring viral and bacterial diseases and infections that can impact military mobilization, deployment, or force effectiveness.

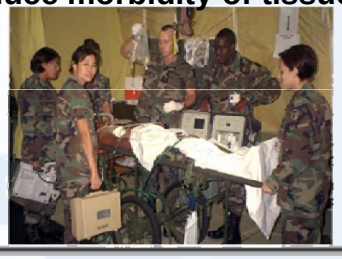
Combat Casualty Care/Clinical Rehabilitative Medicine

Goal: Program is designed to meet the needs of first responders in order to reduce preventable combat deaths and reduce resultant morbidities in survivors. This includes controlling non-compressible bleeding with drugs and devices, drugs to stabilize metabolism and protect tissues after hemorrhage, and clinical practices guidelines, and rehabilitative care innovations required to reset our wounded warriors, both in terms of duty performance and quality of life.

Control of non-compressible bleeding



Fluids to sustain life and reduce morbidity of tissues



Tests and treatments for coagulopathy of trauma

Tissue transplantation programs

Psychological Health & Resilience and Traumatic Brain Injury (TBI)

Goal: Develop interventions to prevent and reduce combat-related behavioral health problems and cognitive deficits associated with PTSD and TBI, including depression, anger problems, post-concussive symptoms, and other health risk behaviors; develop faster treatments to alleviate symptoms.

- **Measures for concussion-related cognitive impairment using neuropsychological assessment tools following blast and blunt trauma injuries**
- **Integrated mental health training systems and interventions for resilience, reduce risk behaviors, for the prevention/treatment of suicide and PTSD**
- **Optimized individualized PTSD drug and psychotherapy treatments**
- **Screening of novel drugs and alternative therapeutic strategies, including novel stem cell strategies and selective brain cooling, to manage traumatic brain injury**
- **Clinical evaluation of analytical test to diagnose presence and severity of TBI at or near point of injury**

Infectious Diseases (Drugs & Vaccines)

Goal: Develop methods to prevent, treat, and/or diagnose naturally occurring viral and bacterial diseases and infections that can impact military mobilization, deployment, or force effectiveness.

- **Suitable formulations of next generation malaria prophylaxis drugs for use in future testing in humans.**
- **Candidate vaccines against *Shigella*, Enterotoxigenic *Echerichia coli* (ETEC) and *Campylobacter* (the three most common bacterial causes of diarrheal diseases in deployed US forces)**
- **Polyclonal neutralizing antibodies against lethal viruses that could be used to provide "instant immunity" or post-exposure treatment in unvaccinated personnel deployed to high risk areas**

Combat Casualty Care/Clinical Rehabilitative Medicine

Goal: Program is designed to meet the needs of first responders in order to reduce preventable combat deaths and reduce resultant morbidities in survivors. This includes controlling non-compressible bleeding with drugs and devices, drugs to stabilize metabolism and protect tissues after hemorrhage, and clinical practices guidelines, and rehabilitative care innovations required to reset our wounded warriors, both in terms of duty performance and quality of life.

- **Preclinical studies on contributions of the immune system and blood products to the body's ability to properly clot blood following trauma**
- **Advanced patient monitoring technologies that rapidly and accurately detect early-onset of blood loss, continuously estimate blood loss volume, and predict patient's risk for cardiovascular collapse**
- **New methods to control life-threatening bleeding from areas of the body where tourniquets may not be effectively used, such as within the chest and abdomen, and from injuries to the armpit or groin**
- **Improved blood platelet (important factor required for blood clotting) storage technologies suitable for far forward use**

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