

Post Traumatic Stress: PTS Disorder to PTS Growth

Auburn University
Center for Governmental Services

November 3 - 4, 2011
Mobile, Alabama

Conference Sponsors

Alabama Department of Mental Health
Alabama Department of Rehabilitation
Greenleaf
UAB School of Medicine

Conference Partners

Alabama National Guard
Alabama Department of Veterans Affairs
Alabama Department of Public Health
Alabama Department of Mental Health

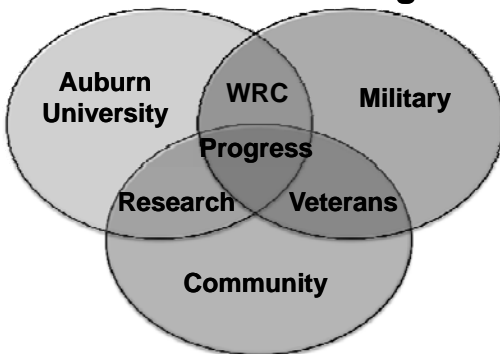
Healing: Mind and Body

Faculty

JoEllen Sefton, PhD, ATC, CMT
Co-Director
Warrior Research Center
Director
Warrior Athletic Training Program
Auburn University



Collaborations for Progress



Mission

- Assist the US Armed Forces in improving individual warrior physical, mental, and technical skill performance in order to fight and win in the 21st century battle space

Goals

- **Improve overall mission readiness of the Armed Forces and translate dual use advances to the veteran and civilian sector**
- **Reduce the number/severity of injuries**
- **Improve rehabilitation/treatments speeding return to duty**

Goals

- **Improve equipment and training methods**
- **Advance educational/training strategies to improve learning/leadership**

Goals

- **Serve our Wounded Warriors and Veterans with research, education, and development**

Healing: Mind

“Men and women are not prisoners of fate, but only prisoners of their own minds.”

– Franklin D. Roosevelt

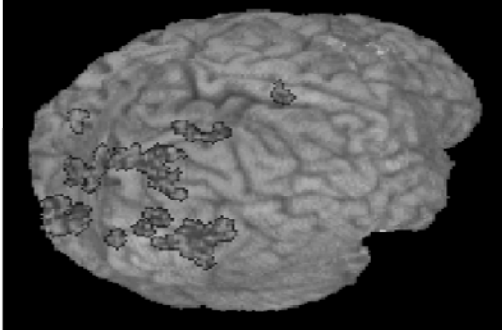
Auburn MRI Research Center

- **Structural scanning**
- **Real time fMRI**
- **Diffusion tensor imaging**
- **Hyperscanning**
- **3T and 7T or around the world**
- **Spectroscopy**

Auburn MRI Research Center

- **Biofeedback, EEG, etc.**
- **Specialized coil development and engineering expertise**

Auburn MRI Research Center

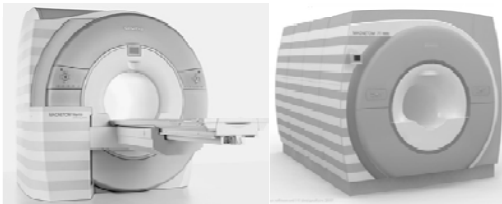


MRI Facility Overview

- MRI systems
 - 3 Tesla (T) open-bore whole body
 - 7T whole body
- Designed to support research and clinical operations
 - Clinical imaging center
 - Laboratories

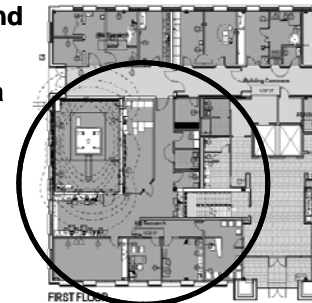
MRI Facility Overview

- Training facilities
- Distance course classrooms
- Human and animal facilities



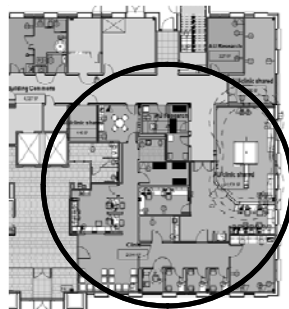
MRI Facility Overview - Design

- 3T Clinical and Research Imaging Area



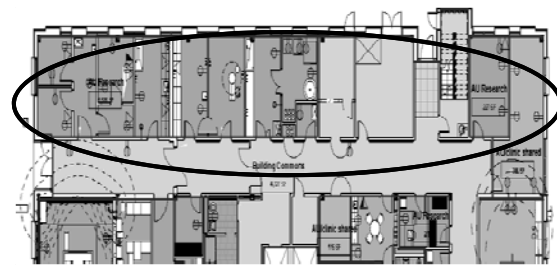
MRI Facility Overview - Design

- 7T Research Imaging Area



MRI Facility Overview - Design

- Wet labs, animal access, and housing



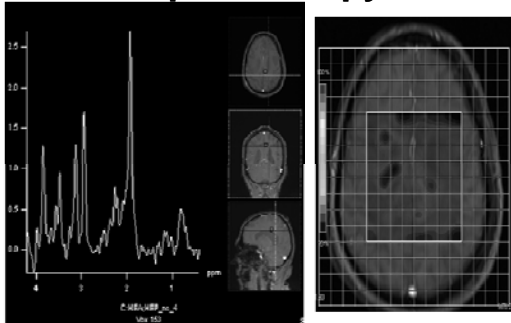
MRI Facility Overview – 3rd Floor, Warrior Research Center



Spectroscopy

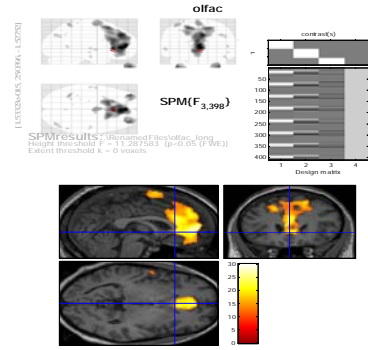
- Proton spectroscopy (3T and 7T)
 - Single voxel
 - Chemical shift imaging
- Multinuclear spectroscopy (7T only)
 - 7Li, 13C, 17O, 19F, 23Na, 31P

Spectroscopy

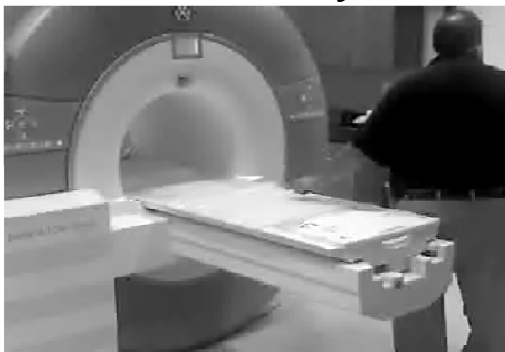


NAA Metabolite Map

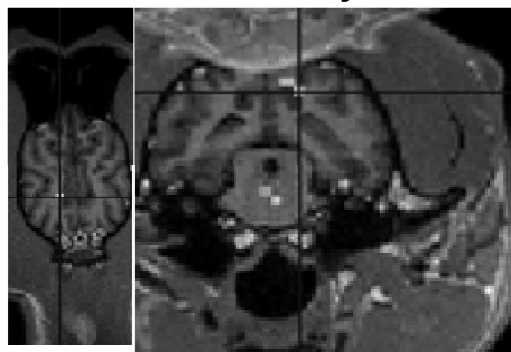
Canine Olfactory fMRI



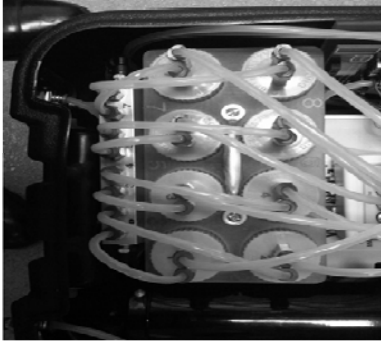
Canine Olfactory fMRI



Canine Olfactory fMRI



Canine Olfactory fMRI



Post-traumatic Stress Disorder

- **Diagnosis**
 - Today: interviews, self-reporting
- **Limitations**
 - Retrospective reporting
 - Response bias: potential for malingering

Post-traumatic Stress Disorder

- Need for objective biological indicators
 - **Imaging**
 - **Genomics/proteomics**
- **Tracking treatment**
 - Do potential therapies actually work?

Post-traumatic Stress Disorder

- **Issues unique to the military**
 - Co-existing mild TBI and tinnitus
 - Theater/trauma specific events
- **Therapy**
 - Meditation
 - Massage
 - rTMS

Basic Mechanisms of Self-regulation

- **Problem**
 - How are self-regulation constructs arising from distinct approaches - such as emotion regulation, executive control, delay discounting, impulsivity - related in terms of the basic emotional, cognitive, motivational and neurobiological processes?

Basic Mechanisms of Self-regulation

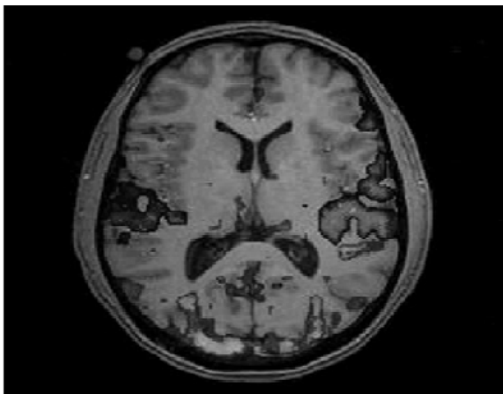
- **Purpose**
 - Develop a neuroimaging paradigm which engages all the distinct approaches to self-regulation and integrate the results

Basic Mechanisms of Self-regulation

- Plan
 - Perform fMRI experiments on above approaches
 - Identify common brain areas involved
 - Provide a conceptual framework for integration

Basic Mechanisms of Self-regulation

- Impact
 - Self-regulation is central to psychiatric pathologies and addiction
 - The outcomes will help optimize experimental designs for studying self-regulation



Mental Skills Foundations



Mental Skills Foundations

- PTSD, attention control – mind/body connection
- CSF=PREP – army resiliency training
 - Attention control – better able to heal

Wounded Warriors and Veterans

- Contributing to confidence and a belief in one's self contributes significantly to the Warrior's return to duty, lower depression, higher self-esteem, employment after injury, healing, and successful return to a productive and happy life

Stress Fracture Prevention and Treatment



Warrior Athletic Training Program

- Sports medicine care and research

Collaborations = Progress

