Stennis Space Center, MS—
The Special Warfare Combat-craft Crewmen (SWCC) is one of the elite combat units of Naval Special Warfare and specialize in the operation of rapid mobility in shallow water where larger ships cannot operate.

Modeled after our research with Naval Special Warfare Group 2, this project will identify injury risk factors that are culturally-specific to the SWCC.

Unintentional musculoskeletal injuries limit the physical capabilities of the Warfighter to train efficiently and will impact tactical readiness. Many of these injuries are preventable with physical training based on tactical performance. Physical training is the cornerstone of the weapons platform as a Warfighter and significant costs are associated with training and maintaining the Warfighter for deployment.

The objective of our Department of Defense research is to maximize human capital by reducing the rate of unintentional musculoskeletal injury, sharpening battlefield performance, optimize physical readiness, extending the tactical lifecycle of the Warfighter, and enhancing quality of life after service.

Naval Special Warfare Group 4—Special Boat Team 22

The purpose of this multi-phase research study is to create an injury prevention and human performance initiative for Naval Special Warfare Group 4 SWCC that is systematically developed based on task and demand analyses of training and tactical simulation, identification of risk factors for injury, and improvement of suboptimal physical, physiological, and nutritional parameters.

Installed in December 2010, the Human Performance Research Laboratory at Special Boat Team 22 is currently performing task and demand analyses. The task analysis will identify SWCC-specific tasks during which injuries occur and the mechanisms of injury. The demand analysis will identify the physiological and metabolic requirements of SWCC training.

The second phase of research will test for suboptimal biomechanical, musculoskeletal, physiological, and nutritional characteristics which necessitate targeted training to decrease the risk of unintentional musculoskeletal injury and improved physical readiness.

This work was supported by the Office of Naval Research, Grant #N00014-10-1-0912
ETAP Development
The Eagle Tactical Athlete Program (ETAP) was developed following a four phase model which includes Injury Surveillance and Task/Demand Analyses, Predictors of Injury and Optimal Performance, ETAP Design and Validation, and ETAP Division Implementation and Surveillance.

ETAP was validated in an 8 week trial to induce favorable adaptations to the suboptimal characteristics previously identified.

ETAP was integrated into Division PT to replace individual PT at Fort Campbell and is currently being evaluated to mitigate injuries and improve performance. To date, over 1000 NCOs have completed ICS and 20,000 Soldiers have been exposed to ETAP.

CURRENT RESEARCH
ETAP Injury Mitigation Efficacy
The data from this aim will validate the efficacy of ETAP to mitigate unintentional musculoskeletal injuries in garrison and theater. This study employs an experimental/control group design to evaluate injuries 12 months prior to ETAP or non-ETAP control physical training intervention and 18 months post intervention. To date, monitoring of unintentional musculoskeletal injuries is being performed on 1478 Soldiers.

ETAP Performance Efficacy
The data from this aim will confirm knowledge transfer from the research investigators to the ICS certified NCOs, and establish long-term effects of ETAP on performance. The data will also identify training gaps between garrison and deployment environments. To date 51 Soldiers have been enrolled and performed baseline and post-ETAP laboratory, performance, and APFT testing following ICS implementation.

ETAP Risk Factor Identification
The data from this aim will identify risk factors for unintentional musculoskeletal injury in Soldiers. Screening recommendations will be made for injury risk and early identification of individuals who may require targeted intervention. The data will also allow for ETAP refinement recommendations as predictors are identified. To date, 460 Soldiers have been enrolled in this aim.

FUTURE RESEARCH
ETAP/PRT Trial
This aim will evaluate the ability of ETAP to improve laboratory, performance, Warrior Tasks, and APFT testing compared to TC 3-22.20 Physical Readiness Training (PRT). A 12-week randomized controlled trial will examine the relationship between ETAP and PRT on variables including laboratory performance, tactical tasks, and APFT testing.

Nutrition Performance Optimization
This aim will address specific nutrition strategies to optimize fueling and to expedite muscle healing and recovery from daily physical training. A comprehensive dietary supplement education program will address physiological rationale for use, potential risks and benefits and safe and effective dietary alternatives.

This work was supported by the US Army Medical Research and Material Command (Research grant USAMRMC/TATRC #W81XWH-06-2-0070/#W81XWH-09-2-0095/#W81XWH-11-2-0097). Opinions, interpretations, conclusions, and recommendations are those of the author and not necessarily endorsed by the US Army.
Little Little Creek, VA—

Naval Special Warfare Group 2, a maritime Special Force, is a tactical force with strategic impact that is able to conduct multiple missions against targets that larger forces cannot approach undetected.

Established in January 2008, the Human Performance Research Laboratory at Little Creek, VA has performed testing for phases 1 and 2 of this research project. The aim of the first two years of research was to evaluate suboptimal biomechanical, musculoskeletal, physiological, and nutritional characteristics that contribute to injury and inhibit optimal performance in the Operators. At the completion of phase 2, specific recommendations were provided to the NSWG2 human performance personnel for considerations to augment their physical training protocol, provide Operator review of laboratory data and nutritional habits for consultation, and establish laboratory testing cycle to demonstrate training adaptations.

In conjunction with NSGW2 human performance personnel, our phase 3 research will develop and validate an “augmented” human performance training program to modify the suboptimal characteristics previously identified during phases 1 and 2. Phase 3 research will also prospectively identify risk factors for injury which are culturally-specific to the tactical demands of the SEAL.

This work was supported by the Office of Naval Research, #N00014-07-1-1190/#N00014-08-1-0412.

Fort Bragg, NC—

The mission of the US Army Special Operations Command is to organize, train, educate, man, equip, fund, administer, mobilize, deploy and sustain Army special operations forces to successfully conduct worldwide special operations, across the range of military operations, in support of regional combatant commanders, American ambassadors and other agencies as directed.

Modeled after our work with Naval Special Warfare Group 2 and Group 4, the USASOC project will support development of USASOC’s Tactical Human Optimization, Rapid Rehabilitation, and Reconditioning (THOR3) program to identify the priorities necessary for improvement and change in the current physical training program. The data from this study will be used to develop a predictive model to identify Special Forces Soldiers who are predisposed to musculoskeletal injury based on task and demand analyses, biomechanical, musculoskeletal, physiological, and injury prevalence data.

The Human Performance Research Laboratory at Fort Bragg is scheduled for installation summer 2011.

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“I’m excited about what the University of Pittsburgh is doing for us. They’re in the second year of a long-term study to collect just that kind of injury and performance data we need, both before the rotation and once the soldier returns, and providing the soldier the tools he needs to work on when he is deployed.”

~ General Peter W. Chiarelli, Vice Chief of Staff of the U.S. Army
March 11, 2009
Committee on Appropriations – Subcommittee on Defense
Presentations and Publications


