

PHYSICAL & COGNITIVE OPERATIONAL RESEARCH ENVIRONMENT

OPERATIONAL READINESS & HEALTH



BACKGROUND

In support of warfighter health and readiness, NHRC's Immersive Virtual Reality Environment (IVRE) is used to test and evaluate the impact of physical and cognitive stressors on military performance. The IVRE is also used to develop advanced rehabilitation programs for wounded warriors with amputation, musculoskeletal injuries, TBI, or PTSD.

VALUE

The PhyCORE team leverages advanced technologies to create a safe, controlled IVRE to:

- ◆ Increase resilience and operational readiness
- ◆ Define the physical and cognitive limits of healthy and injured warfighters
- ◆ Evaluate new technologies for measuring performance and reducing injuries
- ◆ Improve wounded warrior care and rehabilitation

GOALS

To conduct research that tangibly improves warfighter physical and cognitive readiness and resilience through advanced, interactive technology in collaboration with clinicians and military stakeholders

CAPABILITIES

With expertise in biomechanics, physiology, neuroscience, and psychology, our interdisciplinary PhyCORE team specializes in research using the Computer Assisted Rehabilitation Environment (CAREN) as part of our IVRE and related technologies to create operationally relevant and therapeutic applications. Subjects can be challenged physically and cognitively as objective performance outcomes are measured. Systems capabilities include:

- ◆ CAREN with a 6-degree of freedom motion platform, high performance treadmill, optical and inertial motion capture systems, 3D projection, scent and surround sound systems Driving simulator
- ◆ Mobile EEG, EKG, force, oxygen consumption, eye tracking, and surface EMG systems
- ◆ Laser shooting simulator

RESEARCH

- ◆ Evaluation of personal protective equipment on warfighter performance
- ◆ EEG measurement identifying objective neuromarkers of performance
- ◆ Evaluation of functional movement measures of performance and injury prevention
Fall prevention training for warfighters with lower extremity trauma
- ◆ Static and dynamic validation of mobile EEG systems
- ◆ Evaluation of targeted, novel vestibular rehabilitation programs for TBI
- ◆ Exposure based therapy for post-traumatic stress

