

USAARL's Current Research

Effects of Head-Supported Weight on Army Warfighters

Army aviators and ground Soldiers use head-supported devices in a wide variety of training and combat scenarios. Researchers are developing guidelines for equipment designers and Army leaders that will allow the safe use of these important devices.

Occupant Restraint Systems

Soldiers depend on occupant restraints to reduce the risk of contact injuries during air and ground vehicle accidents. Epidemiological data reviews, as well as examinations of restraint systems involved in actual mishaps, are being done to determine the effectiveness of existing occupant restraint systems.

Warfighter Head Protection

The new Advanced Combat Helmet, intended to be the Future Force's interim helmet, has undergone extensive evaluation in the USAARL helmet laboratory for its protective capability. New materials are being investigated for potential use in this and other protective helmets, and new models for assessing Soldier face and eye injury are being developed.

Cockpit Air Bag System

aircrew, associated with developmental and production cockpit air bag systems.

Acoustics

The acoustics team is researching the ability of hearing impaired aviators to use 3D auditory displays. Research continues to develop an electronic stethoscope that will enable medical personnel to hear heart and breath sounds in a high noise environment.

Aircrew Endurance and Sustainment

Mission-driven changes in work schedules and rapid deployment can produce stress and fatigue that limit aircrew performance. USAARL develops pharmacologic and physiologic countermeasures to maintain aviator performance and tests them in the flight simulator laboratory and in actual flight.

Advanced Optical Measurements and Correction

Vision scientists are currently investigating optical systems, adaptive optics and other technologies, that enhance the visual performance of the Warfighter. We are helping to define the optical limits of the human visual system and evaluate visual enhancing systems under operational conditions.

Cognitive Workload

USAARL research neurologists, psychologists, and aviators are combining efforts to study workload and cockpit resource management issues in Army environments. Products will include workload models and validated cognitive design guidelines.

Visual Performance with Electro-Optical Displays

Visual performance researchers advanced the development of a field portable, image-quality tester for the Apache helmet-mounted display. Human factors issues associated with advanced binocular/biocular helmet-mounted displays are under study.



USAARL Expertise

- Aviation visual systems research
- Helicopter crash injury research
- Helmet impact and retention testing
- Aviator flight performance research
- Aeromedical evacuation equipment testing
- Aircrew hearing protection and communications research
- Cognitive modeling and workload assessment

USAARL Facilities

- NUH-60FS research flight simulator
- JUH-60A helicopter
- Anechoic chamber
- Multi-axis ride simulator
- Freefall helmet drop tower
- Fabrication shop
- Two fully-equipped sleep laboratories
- Electromagnetic interference (EMI) chamber
- Shaker table
- Fully-equipped audiology laboratory
- World-class aeromedical research/reference library

USAARL Mission and Vision

USAARL's mission is to preserve and enhance the health, safety, combat effectiveness and survivability of the U.S. Army aviator and Soldier.

Our vision is composed of five major task areas:

- Reducing health hazards and improving human performance in Army aviation platforms, tactical combat vehicles and weapons systems.
- Evaluating and mitigating health hazards of noise, acceleration, impact, visual demands, and stress and fatigue of systems operators.
- Enhancing aviation life support equipment through improved design.
- Assisting in the development of aircrew entry and retention criteria.
- Evaluating medical devices for use aboard medical evacuation aircraft.

Through research, USAARL preserves and enhances the health, safety, combat effectiveness, and survivability of the Warfighter.



For today's Soldier . . .

The USAARL is one of six research laboratories within the U.S. Army Medical Research and Materiel Command (MRMC). Our research encompasses three of the MRMC's major research areas. They are systems health hazards, hazards of mechanical forces, and combat crew effectiveness. Our unique and highly skilled workforce is evenly divided between civilian and military personnel, consisting of rated aviators, physicians, doctoral and masters level researchers, and skilled technicians. USAARL is composed of a support division and three research divisions: Warfighter Protection Division, Warfighter Performance and Health Division, and Sensory Research Division.

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