



Inclusive Air travel for Patients who use WheelChairs

Who Is *All Wheels Up*?

- ▶ AWU is a 501(c)(3) not-for-profit organization
- ▶ AWU is the **only** organization in the world crash-testing wheelchair restraints for in-cabin use
- ▶ Twitter: @allwheelsup
- ▶ FaceBook: All Wheels Up
- ▶ Website: www.allwheelsup.org

AWU Accomplishments

- ▶ Most successful petition for wheelchair (WC) spot globally
- ▶ Conducted first crash test of WC restraints
- ▶ Secured partnerships and nondisclosure agreements (NDAs) with major stakeholders
- ▶ Host annual working groups with major stakeholders beginning int 2018
- ▶ Conducted first tests of wheelchairs as airplane seats

AWU Mission and Goal

Mission

- ▶ Through research and advocacy, we work to increase awareness and ultimately the feasibility of a wheelchair spot on airplanes

Goal

- ▶ Create a wheelchair spot on planes

AWU Key Areas of Focus

- ▶ Crash testing wheelchair tie-down systems for commercial flights at contracted Federal Aviation Administration (FAA)-approved facility
- ▶ University research for supporting data
- ▶ Data collection (surveys)
- ▶ Using AWU research to benefit evacuations during disaster situations
- ▶ Urban Elevate to provide data and create standards that support inclusive transport
- ▶ Funding research that will bring a wheelchair spot to the public

The First Wheelchair-Accessible Plane: “Sacred Cow,” 1943

- ▶ President Roosevelt flew in the first-ever wheelchair-accessible plane
- ▶ “The most powerful man in the world being carried like a baby ...” —Winston Churchill

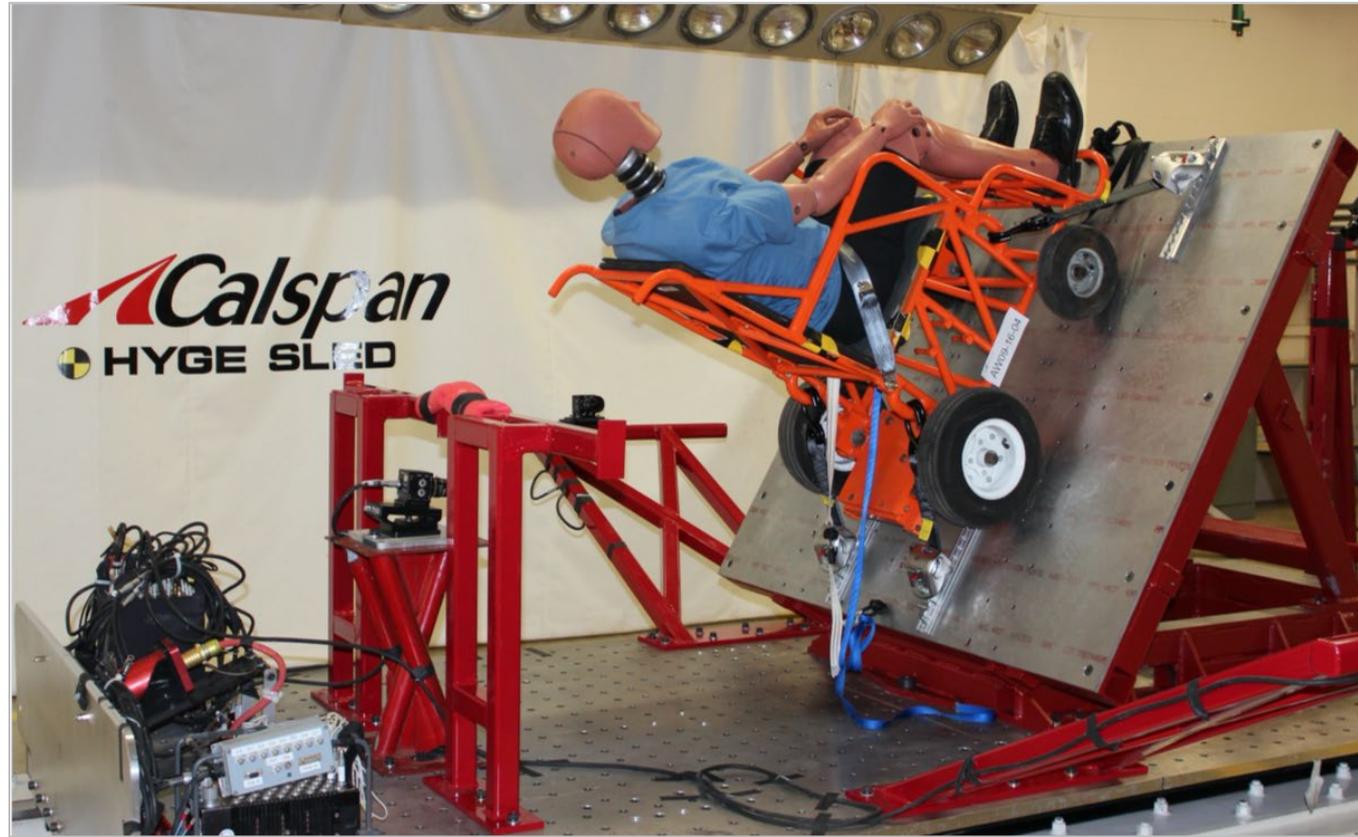


Wheelchairs Tied Down On Military Exercises



Image source: Gordon Ratry.

2016 - AWU
Makes History:
14 CFR 25.562



Aerospace Testing Standards

- ▶ Tested according the FAA standards for in-cabin use
 - ▶ The same test for airplanes seats, drink carts, etc.
- ▶ **14 CFR 25.561 and 14 CFR 25.561.562**
 - ▶ Title 14: aeronautics and space
 - ▶ CFR: Code of Federal Regulations
 - ▶ Part 25: airworthiness standards
 - ▶ .561: general aviation
 - ▶ .562: emergency landing dynamic conditions

FAA/DOT's Test Criteria

- ▶ Will the wheelchair fly out of the plane?
 - ▶ AWU results = **NO**
- ▶ Will the wheelchair fall over on its side?
 - ▶ AWU results = **NO**
- ▶ Will the tie-downs rip away from the floor?
 - ▶ AWU results = **NO**
- ▶ Will the straps tear during crash test?
 - ▶ AWU results = **NO**

16G Pulse Test

Airplane seat crash test—16G



All Wheels Up crash test—16G



Additional Research and Development Is Needed

- ▶ Concept to Implementation Roadmap will be created by National Institute for Aviation Research (NIAR)
- ▶ Determine standards for:
 - ▶ Wheelchair Securement Systems
 - ▶ Wheelchairs
- ▶ Additional Benchmarking
 - ▶ Additional market securement systems
 - ▶ Manual wheelchairs
- ▶ Development of commercial aviation wheelchair securement systems and Wheelchairs
- ▶ Testing for FAA approval
 - ▶ Developed Wheelchair Securement systems and Wheelchairs
 - ▶ Batteries (batteries have been tested for transit flight)
 - ▶ Structure of the airplane floor
 - ▶ Flammability

Questions?

MicheleErwin@AllWheelsUp.org

www.AllWheelsUp.org



References

- ▶ Bahrami, A. (2006). Dynamic Evaluations of Seat Restraint Systems and Occupant Protection on Transport Airplanes. Federal Aviation Administration. Advisory Circular (AC 25.562-1B). Retrieved on January 28, 2020, from https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22657
- ▶ Q'Straint. (2011). Retrieved June 2011, from www.qstraint.com