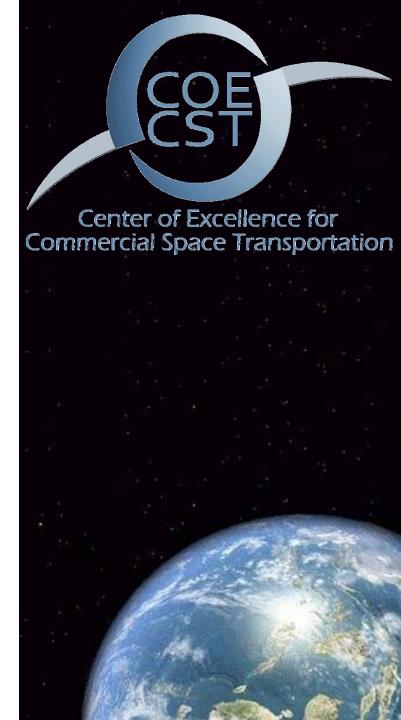
COE CST Fifth Annual Technical Meeting

Task 309: Assessment of Screening and Training Requirements for Pilots with Repeated Exposures to Sustained High Acceleration

James Vanderploeg, MD, MPH



October 27-28, 2015 Arlington, VA

Agenda

- Team Members
- Task Description
- Schedule
- Goals
- Results
- Conclusions and Future Work

Team Members

- Principal Investigator: James Vanderploeg, MD
- Co-Investigators: Rebecca Blue, MD; Tarah Castleberry, DO; Charles Mathers, MD
- Residents: Benjamin Johansen, DO; Robert Mulcahy, MD; James Pavela, MD; Rahul Suresh, MD

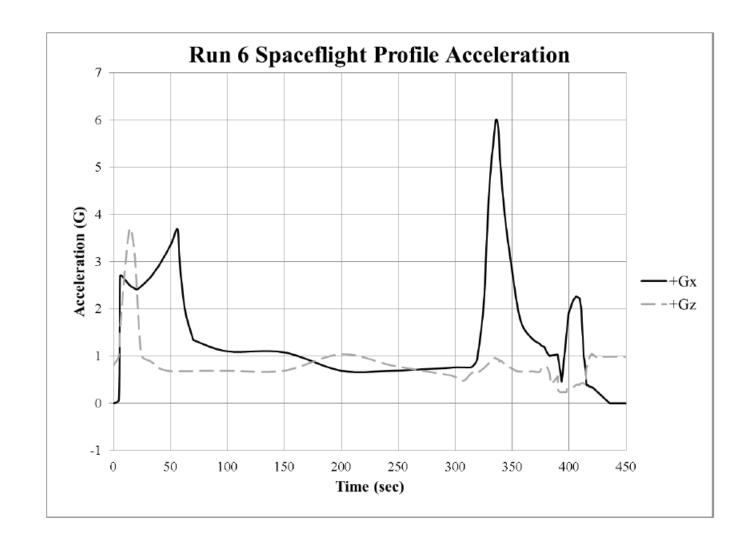
- Organizations
 - NASTAR Center Matching Funds
 - Virgin Galactic

Task Description

- Repeated exposure of the flight crew to sustained high +Gx and +Gz acceleration in highly demanding spaceflight profiles is a new and untested paradigm.
- Identifying the unique physiological challenges and medical clearance requirements will enable spaceflight operators to ensure safe operations.

Vehicles





Task Description

Suborbital spaceflight profiles

- Combined +Gx and +Gz
- Peak +6.0Gx/+4.0Gz

Repeated exposures

Schedule

- Complete IRB approval process
- Recruit pilots for research study
- Conduct aerobatic flights and NASTAR testing throughout 2016
- Conduct physiological monitoring during spaceflights in 2016/2017

Goals

- Compare pilot performance and physiological response in aerobatic flights, centrifuge acceleration profiles, and actual spaceflight.
- Develop recommendations for pilot training and medical screening.

Results

Pending

Conclusions and Future Work

- Collecting early data on acrobatic pilots flying sustained +G_z exposures (i.e. prolonged G pull-outs from a dive or tight turns)
- IRB research protocol being prepared

Task 309: Assessment of Screening and Training Requirements for Pilots with Repeated Exposures to Sustained High Acceleration

utmb Health Aerospace Medicine



- University: The University of Texas Medical Branch
- Principal Investigator: James Vanderploeg, MD
- Co-Investigators: Rebecca Blue, MD; Tarah Castleberry, DO; Charles Mathers, MD
- Residents: Benjamin Johansen, DO; Robert Mulcahy, MD; James Pavela, MD; Rahul Suresh, MD

Relevance to Commercial Spaceflight Industry

 Repeated exposure of the crew to sustained high +Gx and +Gz acceleration in highly demanding spaceflight profiles is a new and untested paradigm. Identifying the unique physiological challenges and medical clearance requirements will enable spaceflight operators to ensure safe operations.

Statement of Work

- Compare pilot performance and physiological response in aerobatic flights, centrifuge acceleration profiles, and actual spaceflight.
- Develop recommendations for pilot training and medical screening.



Status

- Collecting early data on acrobatic pilots flying sustained G exposures
- IRB research protocol being prepared

Future Work

- Complete IRB approval process
- Recruit pilots for research study
- Conduct aerobatic flights and NASTAR testing throughout 2016
- Conduct physiological monitoring during spaceflights in 2016/2017

