

COE CST Second Annual Technical Meeting:

256: Tolerance of Centrifuge- induced G-force by Disease State

James Vanderploeg, MD



November 1, 2012



**Federal Aviation
Administration**



Overview

- Team Members
- Purpose of Task
- Research Methodology
- Results
- Conclusions
- Next Steps
- Contact Information



Team Members

- PI: Jim Vanderploeg, MD (UTMB Aerospace Med.)
- Co-I: Richard Jennings, MD (UTMB Aerospace Med)
- Student: Becky Blue, MD (UTMB Aerospace Med.)
- Student: James Pattarini, MD (UTMB Aerosp. Med.)
- Student: David Reyes, MD (UTMB Aerosp. Med.)
- Brienna Henwood (NASTAR Center)
- Christine Smith (Wyle Laboratories)

Students at NASTAR



NASTAR Center



COE CST Second Annual Technical Meeting (ATM2)
October 30 – November 1, 2012



Purpose of Task

- Purpose:
 - Evaluate subjects with defined disease states under the G-loads expected during commercial space flights using centrifuge-induced G-forces
- Disease States
 - Controlled cardiovascular/coronary disease
 - Controlled hypertension
 - Controlled diabetes
 - Pulmonary disease
 - Spinal disease or injury

Objectives

- Train & evaluate test subjects with a range of medical conditions to characterize their responses to the acceleration environment
- Evaluate biomedical monitoring equipment under the G profiles of commercial space flights
- Develop optimal acceleration training protocols for passengers

Goals

- Expected benefits from this project:
 - Characterization of responses of individuals with several common medical conditions
 - Development of risk mitigation strategies for individuals with those medical conditions
 - Validation of wearable biomedical monitoring equipment for use during commercial space flights.

Completed Milestones

- Completed IRB approval
- Developed online screening medical questionnaire
- Defined medical monitoring protocol
- Secured agreement from Virgin Galactic and XCOR to solicit volunteers for study from their customer lists
- Initiated subject recruitment

Next Steps

- Continue subject recruitment and medical clearance
- Conduct training and evaluation using the NASTAR centrifuge
- Evaluate biomedical monitoring equipment from task 255
- Perform data analysis
- Publish results
- Obtain no-cost extension from FAA AST

Quad Chart – Task 256

MAJOR MILESTONES - PAST

- Completed IRB approval
- Developed online screening medical questionnaire
- Defined medical monitoring protocol
- Secured agreement from Virgin Galactic and XCOR to solicit volunteers for study from their customer lists
- Initiated subject recruitment

MAJOR MILESTONES - FUTURE

- Continue subject recruitment and medical clearance
- Conduct training and evaluation using the NASTAR centrifuge
- Evaluate biomedical monitoring equipment from task 255
- Perform data analysis
- Publish results

SCHEDULE

- November - January 2012: Subject recruitment and medical screening
- December 2012 – March 2013: Subject testing and evaluation
- April 2013 – Data analysis
- May 2013 – Final report

BUDGET

- FY13 - FY14 - FY15 - FY16 - FY17
- \$42K* - \$0 - \$0 - \$TBD - \$TBD
- *Funding augmented by \$20,000 from grant from NSBRI

Contact Information

- Jim Vanderploeg, MD, MPH
2.102 Ewing Hall, UTMB
301 University Blvd.
Galveston, Texas 77555-1110
Phone: 1-409-747-6131
Fax: 1-409-747-6129
Email: jmvander@utmb.edu