

Fiscal Year:	FY 2009	Task Last Updated:	FY 08/12/2009
PI Name:	Dulchavsky, Scott A. M.D., Ph.D.		
Project Title:	Bracelet Investigation		
Division Name:	Human Research		
Program/Discipline:	NSBRI		
Program/Discipline-- Element/Subdiscipline:	NSBRI--Smart Medical Systems and Technology Team		
Joint Agency Name:	TechPort:	No	
Human Research Program Elements:	(1) HHC: Human Health Countermeasures		
Human Research Program Risks:	(1) Cardiovascular: Risk of Cardiovascular Adaptations Contributing to Adverse Mission Performance and Health Outcomes		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Detroit	State:	MI
Zip Code:	48202-2608	Congressional District:	13
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	2007 Crew Health NNJ07ZSA002N
Start Date:	07/01/2008	End Date:	06/30/2011
No. of Post Docs:	0	No. of PhD Degrees:	0
No. of PhD Candidates:	0	No. of Master' Degrees:	0
No. of Master's Candidates:	0	No. of Bachelor's Degrees:	0
No. of Bachelor's Candidates:	0	Monitoring Center:	NSBRI
Contact Monitor:	Contact Phone:		
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Sargsyan, Ashot (Wyle Laboratories) Hamilton, Douglas (Wyle Laboratories) Ebert, Douglas (Wyle Laboratories)		
Grant/Contract No.:	NCC 9-58-SMST01602		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>This proposal is a resubmission for NASA NNJ07ZSA002N and will provide information on crew health and performance risks, develop counter-measures, and develop technologies with strategies for monitoring and mitigating crew health. The objectives of this study are to validate just-in-time training methodologies for cardiovascular ultrasound imaging during long duration spaceflight and to quantify the effects of the Bracelet device on the cardiovascular system in ground based and flight experiments. The ultrasonic diagnostic investigations described in this proposal will provide a clinically relevant increased understanding of cardiovascular physiology as well as significant advances in space medical capabilities to facilitate exploration-class space missions.</p> <p>The research investigations will use a tiered methodology: I. Ground based investigations at the Johnson Space Center (Evaluation of the cardiovascular effects of the Bracelet device with ultrasound, Ultrasound optimization of Bracelet device application). II. Simulated Microgravity investigations at the Johnson Space Center (Human factors optimization of stress cardiovascular ultrasound examination, Physiologic effects of simulated microgravity on cardiovascular performance, Effects of the Bracelet device on cardiac function in bed rest subjects) III. Optimization of just-in-time training methodologies to allow non-expert operators to perform vascular and cardiac ultrasound evaluations at Henry Ford Hospital (Develop rapid hands on methodologies in vascular and cardiac ultrasound, Development and optimization of CD-ROM based training methods in ultrasonography, Compare the accuracy of expert versus just-in-time trained ultrasound operators performing vascular and cardiac ultrasound) and IV. Flight Experiments on the International Space Station (Evaluation of long duration spaceflight on cardiovascular function, Evaluation of the physiologic effects of the Bracelet device on cardiovascular function during long duration spaceflight).</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	<p>The educational methodologies developed for this proposal have significant Earth benefits to teach non-expert operators complex medical procedures. Furthermore, the tele-ultrasound procedures which are critical to this proposal are readily modified for planetary uses in rural, underserved, or military conflicts. Finally, the device being evaluated in this trial produces significant changes in the cardiovascular system which allows further refinement of our knowledge base in cardiac and vascular physiology.</p>
Task Progress:	<p>This proposal has developed an international team (US and Russian) to collaboratively evaluate the effectiveness and mechanism of action of the Bracelet device during microgravity exposure. Numerous meetings were held in Russia, and preliminary data have been obtained from normal volunteers to judge the effectiveness of the device. We have also analyzed data from the International Space Station obtained during DTO activities. We recently presented this data at the 17th annual Humans In Space Symposium in Moscow. We are currently finishing multi-media educational methods to teach non-experts to use ultrasound to evaluate the device on the space station.</p>
Bibliography Type:	Description: (Last Updated: 02/23/2023)
Abstracts for Journals and Proceedings	<p>Duncan JM, Bogomolov VV, Alferova IV, Dulchavsky SA, Ebert DJW, Garcia K, Martin D, Matveev VP, Melton SL, Sargsyan DE, Hamilton DR. "Cardiac Assessment in microgravity using circulating volume modification and respiratory maneuvers." 17th Annual IAA Humans in Space Symposium, Moscow, Russia, June 7-11, 2009.</p> <p>17th Annual IAA Humans in Space Symposium, Moscow, Russia, June 7-11, 2009. , Jun-2009</p>