Fiscal Year:	FY 2010	**Task Last Updated:**	FY 08/06/2010
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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PI Web Page:			
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:	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 fight 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. 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). 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).
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	The unique constraints imposed by the space environment require the development of novel strategies for crew member health evaluation and maintenance. The ultrasonic diagnostic modalities described in this proposal, involving the peripheral arterial and venous system, as well as focused echocardiography, would provide a significant, clinically relevant advance in space medical capabilities to facilitate exploration-class space missions. Terrestrial benefits of this study are also anticipated including enhanced understanding of the cardiovascular effects of venous occlusion in normal and pathologic states. Development of the high fidelity CD ROM-based training program in cardiovascular ultrasound for use by non-medical personnel will have direct educational implication for a broad audience including ultrasound technicians, students, and the lay population. These techniques are readily transferable to training in basic and advanced cardiopulmonary care and CPR training as well as other public health education tasks where non-medical personnel must be introduced to medical concepts in a limited time.
Task Progress:	We have developed a reproducible ground analysis model for the cardiovascular effects of the Bracelet Device and have tested 8 subjects. We are analyzing the data at present and will finish the ground testing portions of the experiment this month. We have been hampered with microgravity testing due to aircraft unavailability, cost, and reported poor parabola quality and will discuss next steps with NSBRI leadership. We are also hampered by a moratorium on bedrest at present due to medical concerns. We are developing just in time training aids to allow non-expert operators to obtain physiologic data on the Bracelet with remote expert guidance.
Bibliography Type:	Description: (Last Updated: 03/14/2025)