

Fiscal Year:	FY 2012	Task Last Updated:	FY 09/12/2013
PI Name:	Platts, Steven H. Ph.D.		
Project Title:	Evaluation of Commercial Compression Garments as a Countermeasure to Post-Spaceflight Orthostatic Intolerance (OIG DSO641)		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Biomedical countermeasures		
Joint Agency Name:	TechPort:	Yes	
Human Research Program Elements:	(1) HHC: Human Health Countermeasures		
Human Research Program Risks:	None		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Houston	State:	TX
Zip Code:	77058	Congressional District:	36
Comments:			
Project Type:	FLIGHT	Solicitation / Funding Source:	Directed Research
Start Date:	02/17/2010	End Date:	04/30/2012
No. of Post Docs:	No. of PhD Degrees:		
No. of PhD Candidates:	No. of Master' Degrees:		
No. of Master's Candidates:	No. of Bachelor's Degrees:		
No. of Bachelor's Candidates:	Monitoring Center: NASA JSC		
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Flight Program:	Shuttle		
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Locke, James Ph.D. (NASA Johnson Space Center) Stenger, Michael Ph.D. (Wyle Laboratories, Inc./NASA Johnson Space Center) Lee, Stuart M.S. (Wyle Laboratories, Inc./NASA Johnson Space Center) Westby, Christian Ph.D. (Universities Space Research Association)		
Grant/Contract No.:	Directed Research		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	<p>One of the most important physiological changes that may negatively impact crew safety is post-flight orthostatic intolerance. Astronauts who have orthostatic intolerance are unable to maintain a normal systolic blood pressure during head-up tilt, have elevated heart rates, and may experience presyncope or syncope with upright posture. This problem affects about 20-30% of astronauts who fly short-duration missions (4–18 days) and 60-80% of astronauts who fly long-duration missions. This condition creates a potential hazard for crew members during re-entry and after landing, especially for emergency egress contingencies.</p> <p>Two countermeasures are currently employed to ameliorate post-flight orthostatic intolerance: fluid loading and an anti-gravity suit. Unfortunately, neither of these is completely effective for all phases of landing and egress; thus, continued countermeasure development is important. Preliminary evidence has shown that commercial graded compression garments that include abdominal compression can significantly improve orthostatic tolerance.</p> <p>The specific aims of this study were:</p> <ol style="list-style-type: none"> 1. Evaluate custom-fitted, commercial compression garments as countermeasures to post-flight orthostatic intolerance during stand tests performed before and after spaceflight. 2. Determine if these garments, which provide a continuous, graded compression from the foot to the hip, with a static compression over the lower abdomen, provide superior fit and comfort as well as being easier to don.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	<p>Results from this study indicate that the gradient compression garments prevented the tachycardia and stroke volume reduction normally associated with a 3.5 min stand test after spaceflight. The garments show promise as a countermeasure against post-spaceflight orthostatic intolerance, can be easily donned, and are relatively comfortable to wear. The efficacy of the garments should be validated after and during recovery from long-duration spaceflight. [Ed. note 9/12/13: information from PI's Task Book Initial Entry Form, provided September 2013]</p>
Bibliography Type:	Description: (Last Updated: 03/01/2018)
Articles in Peer-reviewed Journals	<p>Stenger MB, Lee SM, Westby CM, Ribeiro LC, Phillips TR, Martin DS, Platts SH. "Abdomen-high elastic gradient compression garments during post-spaceflight stand tests." Aviat Space Environ Med. 2013 May;84(5):459-66. PMID: 23713210, May-2013</p>