

Fiscal Year:	FY 2006	Task Last Updated: FY 11/24/2009
PI Name:	Butler, Douglas M.B.A.	
Project Title:	Integrated Medical Model (IMM)	
Division Name:	Human Research	
Program/Discipline:	HUMAN RESEARCH	
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Operational and clinical research	
Joint Agency Name:	TechPort:	Yes
Human Research Program Elements:	(1) <b>ExMC</b> :Exploration Medical Capabilities	
Human Research Program Risks:	(1) <b>Medical Conditions</b> :Risk of Adverse Health Outcomes and Decrements in Performance Due to Medical Conditions that occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures	
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: 22
Comments:		
Project Type:	GROUND	Solicitation / Funding Source: Directed Research
Start Date:	10/01/2005	End Date: 01/31/2011
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:		
Flight Assignment:	NOTE: Received extension to 1/31/2011, per PI; original end date was 9/30/2010 (Jan 2011)	
Key Personnel Changes/Previous PI:		
COI Name (Institution):		
Grant/Contract No.:	Directed Research	
Performance Goal No.:		
Performance Goal Text:	<p>Introduction</p> <p>The Integrated Medical Model (IMM) is a decision support tool useful to mission planners and medical system designers in assessing risk and designing medical systems for specified space flight missions. The IMM provides an evidence-based approach to optimize medical resources and minimize risk within space flight operational constraints.</p> <p>Methods</p> <p>The mathematical relationships among mission and crew profiles, medical condition incidence data, in-flight medical resources, potential crew functional impairments, and clinical end-states are established to determine probable mission</p>	

Task Description:	<p>outcomes. Stochastic computational methods are used to forecast probability distributions of crew health and medical resource utilization, as well as estimates of medical evacuation and loss of crew life. The IMM has been used in support of the International Space Station (ISS) medical kit re-design, the medical component of the ISS Probabilistic Risk Assessment, and the development of the Constellation Medical Conditions List. The IMM will also be used to refine medical requirements for the Constellation program.</p> <p>Discussion</p> <p>The IMM outputs for ISS and Constellation Design Reference Missions will be presented to demonstrate the potential of the IMM in risk assessment, mission planning and medical system design. The implementation of the IMM verification and validation plan will be reviewed. Additional planned capabilities of the IMM, including optimization techniques and the inclusion of a mission timeline will be discussed.</p> <p>Conclusions</p> <p>Given the space flight constraints of mass, volume, and crew medical training, the IMM is a valuable risk assessment and decision support tool for medical system design and mission planning.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	<p>New project for FY2006. [Note: project added to Task Book 11/2009 when received project information]</p>
Bibliography Type:	Description: (Last Updated: 04/10/2019)