Task Book Report Generated on: 05/08/2024

Fixed Year: PY 2019 Task Last Updated: PY 03/22/2019 PI Name: Worting, Vignia Ph.D. Project Title: Dose Tracker Application for Monitoring Crew Medication Usage, Symptoms, and Adverse Effects During Missions of Project Title: The Project Title: The Project Mission of Monitoring Crew Medication Usage, Symptoms, and Adverse Effects During Missions of Project Title: The Project Title: The Project Mission of Mission State Title Project Mission of Mission State Title Project Mission of Mission State Title Project Mission of Mission Capabilities Human Research Program Risks: CI) EAMC-Exploration Medical Capabilities Human Research Program Risks: CI) Modical Conditions Risk of Adverse Health Outcomes and Decrements in Performance Due to Medical Condition Mission, as well as Long Term Health Outcomes Due to Mission Exposures CI) Plaram Risk of Ineffective or Took Medications During Long Duration Exploration Spaceflight Space Biology Special Category: None PI Email: Virginia Motifical Capabilities PI Address 1: Center for Space Medicine PI Address 2: Osion Missis, State 910 PI Web Page: Usuage Additionary Space Research Association until fall 2015. Zip Code: 77030 Congressional District: 9 Comments: PI formerly with Universities Space Research Association until fall 2015. Project Type: FLIGIT Solicitation / Funding Directed Research Source No. of PhD Candidates: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Degrees: No. of Master' Degrees: No. of Master's Candidates: No. of Master' Degrees: No. of Master's Candidates: No. of Master' Degrees: No. of Master's Candidates: No. of Maste				
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Space Biology Cross-Element Discipline: Space Biology Special Category: None PI Email: Virginia Wotring@bem.edu PI Organization Type: UNIVERSITY PI Organization Name: Baylor College of Medicine PI Address 1: Center for Space Medicine PI Address 2: 6500 Main St, Suite 910 PI Web Page: City: Houston State: TX Zip Code: 77030 Congressional District: 9 Comments: PI formerly with Universities Space Research Association until full 2015. Project Type: FLIGHT Solicitation / Funding Directed Research Source: No. of Post Does: No. of PhD Candidates: No. of Master' Scandidates: No. of Master' Degrees: No. of Master's Candidates: No. of Master' Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Bachelor's Candidates: No. of Master's Candidates: No. of Master'	Human Research Program Risks:	that occur in Mission, as well as Long Term Health Outcomes Due to Mission	Exposures	
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Task Description:	NOTE: Continuation of "Dose Tracker Application for Monitoring Crew Medication Usage, Symptoms, and Adverse Effects During Missions" (Internal Project) with the same investigator, Dr. Virginia Wotring, due to PI move to Baylor College of Medicine. Do medications used during spaceflights work the same as they do on Earth? This single question underlies most of the unknowns within NASA's Human Research Program Risk of Clinically Relevant Unpredicted Effects of Medication. During spaceflight, the body undergoes a number of physiological changes that are expected to result in altered interactions with administered medications, but it is not yet known if, or to what extent, these actually occur. The potential for therapeutically relevant alteration in either pharmacokinetics (how the body handles administered medications) or pharmacodynamics (how administered medications act upon the body) has long been a concern. This observational epidemiological study is a proactive step toward addressing this issue via regular direct questioning of crewmember volunteers, a model that the Johnson Space Center (JSC) Nutritional Biochemistry Discipline has proven to be both feasible and useful. A tablet- or handheld device-based questionnaire will be used to permit fast and efficient collection of data regarding crewmembers' medication use on a near real-time basis, eliminating the current problems associated with recall over periods of weeks. Specific questions regarding medication use (somewhat different from the questions that physicians ask regarding patient health) will be asked of each participating crewmember. The data collection process will be streamlined by using a flexibly programmed computerized survey application that leverages the limited medication choices aboard, the doses available, typical dosing frequency, and side effects associated with each medication to provide an individualized short questionnaire for each medication use by the crewmember. Coded (de-identified) data will be delivered weekly to a secure serv	
Rationale for HRP Directed Research:	This research is directed because it contains highly constrained research, which requires focused and constrained data gathering and analysis that is more appropriately obtained through a non-competitive proposal.	
Research Impact/Earth Benefits:	The study demonstrated a significant increase in the amount of medication usage information collected. Self-reports of medication use collected by the app were higher than found in medical records, by more than an order of magnitude. This finding may now be used in determining new medical operations requirements for the collection of this type of information on future missions.	
	This study was proposed to Human Research Program (HRP) as a Directed study to address 3 gaps in pharmacology that had insufficient data: medication use, pharmacokinetics, and pharmacodynamics. It was designed to collect medication use information relevant for researchers as nonintrusively as possible from crewmembers. A total of 24 subjects was requested for participation, but the study was ended by NASA at n=5. The crew data show a pattern of medication use similar to what has been previously reported, with sleep disturbances and muscle/joint pain driving most self-administration. Two subjects treated lengthy skin problems, while 3 used chronic treatments to protect the heart or reduce cholesterol. Crew also used the app to note Drug Tolerance Testing, medication holiday requested in research protocol, and to share personal data with a flight surgeon. Crew provided usability feedback critical of app design and implementation, items that could certainly be altered in after coordinated input from users and NASA operational staff. The study is now complete.	
Task Progress:	Study hardware (iPads) have been wiped and excessed through Johnson Space Center's typical procedures. Data files have been prepared for submission to Lifetime Surveillance of Astronaut Health (LSAH).	
	Preliminary, programmatic level results were presented to international colleagues at the International Society for Gravitational Physiology meeting in Noordwijk, The Netherlands, 17-22 June 2018. Both the abstract and presentation were export controlled. Attendance at this meeting permitted the Principal Investigator (PI) to compare and contrast the Dose Tracker app itself with European Space Agency efforts along similar lines.	
	The same presentation was given at the International Space Station (ISS) Research & Development Conference in San Francisco, CA, 21-26 July 2018. Attendance at this meeting permitted the PI to discuss app development for ISS with other researchers developing software for the ISS now and in the future.	
Bibliography Type:	Description: (Last Updated: 12/24/2019)	
Abstracts for Journals and Proceedings	Wotring V, Smith L. "Dose Tracker: an iOS app for collection of medication use data from volunteer crewmembers on the International Space Station." 39th International Society for Gravitational Physiology (ISGP) & European Space Agency (ESA) Life Sciences Meeting, Noordwijk, Netherlands, June 18-22, 2018. Front Physiol Conference Abstract: 39th ISGP Meeting & ESA Life Sciences Meeting, Published Online: 16 Jan 2019. https://doi.org/10.3389/conf.fphys.2018.26.00047 , Jan-2019	
Articles in Peer-reviewed Journals	Wotring VE, Smith LK. "Dose tracker application for collecting medication use data from International Space Station crew." Aerosp Med Hum Perform. 2020 Jan 1;91(1):41-5. https://doi.org/10.3357/AMHP.5392.2020 ; PubMed PMID: 31852573 , Jan-2020	