Task Book Report Generated on: 04/26/2024

Pl Name: Dukhavaky, Sooti A. M.D., Ph.D. Project Title: Ultrasound Fracture Diagnosis in Space  Division Name: Iluman Research Program Dicipline: HUMAN RESEARCH Program Dicipline- Element/Subdiscipline: IlUMAN RESEARCH Program Dicipline- Element/Subdiscipline: IluMAN RESEARCH Iluman Research Program Elements: () Death CExploration Medical Capabilities  (I) Medical Conditions/Elic of Adverse Health Outcomes and Deverments in Performance Due to Medical Conditions that occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures (2) Renal Stone Formation  Space Biology Element: None  None  Space Biology Element: None  Space Biology Element: None  None  Pl Capability (2) Renal Stone Formation  None  Space Biology Element: Subdichal divibility or Pl Email: Subdichal divibility or Subdichal divibility or Space Biology Special Category: None  Pl Capability or Pl Organization Type: Pl Email: Subdichal divibility or Su				
Project Title: Ultrasound Friedure Diagnosis in Space  Division Name: Human Research  Program/Dicipline: HUMAN RESEARCH  Program/Dicipline: HUMAN RESEARCH  Program/Dicipline: HUMAN RESEARCH—Operational and clinical research  Human Research Program Elements: (DEAMC:Exploration Medical Capabinites)  Human Research Program Risbes: CHEMAN RESEARCH—Operational and clinical research  Human Research Program Risbes: CHEMAN RESEARCH—Operational and clinical research  Human Research Program Risbes: CHEMAN Research  None  Bladdogs CHEMAN Research  None  Pladdogs CHEMAN Research  Human Research Program Risbes Research  Human Research	Fiscal Year:		Task Last Updated:	FY 05/17/2010
Division Name:   Human Research   HUMAN RESEARCH	PI Name:	Dulchavsky, Scott A. M.D., Ph.D.		
Program/Discipline: IIUMAN RESEARCH Program/Discipline- Element/Subdiscipline- Element/Subdiscipline- Human Research Program Element: (I)EMC:Exploration Medical Capabilities  Human Research Program Element: (I)EMC:Exploration Medical Capabilities  Human Research Program Risks: (I)EMC:Exploration Medical Capabilities  Buman Research Program Risks: (I)EMC:Exploration Medical Capabilities  Buman Research Program Risks: (I)EMC:Exploration Medical Capabilities  Space Biology Element: None  Space Biology Special Category: None  PI Email: object Service Program Risks: (I)EMC SERVICE Phone: 313 916 9445  PI Organization Type: PUBLI SERVICE Phone: 313 916 9366  Organization Name: Hearty Ford Health System  PI Address 1: Surgery  PI Address 2: 299 W. Grand Boulevard, CFP-1  PI Web Page:  City: Detecti State  Ago Service Service Resolution Formation State  Comments: State MI  Comments: State MI  Comments: 090 Solicitation / Funding Source 2007 Crew Health NIJOTZSA002N  No. of Post Does: 090 Sistem Bud Dute on Solicitation / Funding Source 2009 Crew Health NIJOTZSA002N  No. of Post Does: 090 Sistem Bud Contact Phone: 281.483.0395  No. of Post Does: 000 No. of Bachelor's Degrees: 0  No. of Post Candidates: 000 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 000 No. of Bachelor's Degrees: 000 No. of Bachelor's Deg	Project Title:	Ultrasound Fracture Diagnosis in Space		
Program/Discipline-  Element/Subdiscipline-  Element/Subdiscipline-  Element/Subdiscipline-  Program Elements   Program Elements   Classification Medical Capabilities   Classification Exposures   Class	Division Name:	Human Research		
Element/Subdiscipline: Joint Agency Name: Joint Agency Name: InchPort: Yes  Whanna Research Program Elemente: (I) ExMC:Exploration Medical Capabilities  (I) Medical Conditions-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 (I) Remail Stance Risk of Remail Stone Formation  Space Biology Element: None  Space Biology Special Category: None  Pl Corganization Type: Pl Email: Space Biology Special Category: None  Pl Corganization Type: Pl Email: Surgery Pl Corganization Type: Pl Address 1: Surgery Pl Address 2: 2799 W. Grand Boulevard. CTP-1  Pl Web Page: City: Agency Pl Web Page: City: Agency Pl Web Page: City: Agency Round Surgery Pl Web Page: City: Agency Round Surgery Pl Web Page: City: Agency Round Surgery R	Program/Discipline:	HUMAN RESEARCH		
Human Research Program Elements: (1) ExMC:Exploration Medical Capabilities  (1) Medical Conditions. Rick of Acherse Health Outcomes and Decrements in Performance Due to Medical Conditions, that secure in Mission as well as Long Term Health Outcomes Due to Mission Exposures (2) Renal Stone Formation  Space Biology Cross-Element  None  Space Biology Special Category: None  PI Email: salada@hibs.org  PI Email: salada@hibs.org  PI Email: salada@hibs.org  PI Organization Type: PUBLIC SERVICE  Phone: 313 916 9345  PI Organization Name: Henry Ford Health System  PI Address 1: Surgery  PI Address 2: 2799 W. Grand Boulevard, CFP-1  PI Web Page:  City: Detroit State: MI  Zip Code: 48202-2608 Congressional District: 13  Comments:  Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NU07ZSA002N  Start Date: 0815/2008 End Date: 0920/2011  No. of Pox Does: 0 No. of Master' Degrees: 0  No. of Pha Degrees: 0  No. of Pha Candidates: 0 No. of Master' Degrees: 0  No. of Bachelor's Candidates: 0 No. of Master' Degrees: 0  No. of Bachelor's Candidates: 0 No. of Master' Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NASA ISC  Contact Email: salamin authins@mass.cov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: Change in Gaps per HRR information (Ed., 9/23/2011)  NOTE: Change in Gaps per HRR information (Ed., 9/23/2011)  Hamilton, Douglas (Wyle)  Kould, Thorms (Henry Ford Hospital)  Hamilton, Douglas (Wyle)  Kould, Thorms (Henry Ford Hospital)  Sargyama, Ashot (Wyle)  Sargyama, Ashot (Wyle)  Sargyama, Ashot (Wyle)	Program/Discipline Element/Subdiscipline:	HUMAN RESEARCHOperational and clinical research		
Comments:   Comm	Joint Agency Name:		TechPort:	Yes
Himman Research Program Risks: chain occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures (2) Renal Stone Risk of Renal Stone Formation  Space Biology Cross-Element  None  Space Biology Special Category: None  PI Email: subleha Richills.org Fax: FY 313 916 9445  PI Organization Type: PUBLIC SERVICE Phone: 313 916 9306  Organization Name: Henry Ford Health System  PI Address 1: Surgery  PI Address 2: 2799 W. Grand Boulevard, CFP-1  PI Web Page:  City: Detroit State: MI  Zip Code: 4820-2608 Congressional District: 13  Comments:  Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NJ07ZSA002N  State Date: 0815-2008 End Date: 0920-2011  No. of Post Docs: 0 0 No. of PhD Degrees: 0  No. of PhD Candidates: 0 0 No. of Master' Degrees: 0  No. of Bachelor's Candidates: 0 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 0 No. of Bachelor's Degrees: 0  No. of Bachelor's Candidates: 0 Monitoring Center: NASA JSC  Contact Monitor: Watkins, Shamail a Contact Phone: 281.485.0395  Contact Monitor: Watkins, Shamail a Contact Phone: 281.485.0395  Flight Assignment: NOTE: End date changed to 920/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gape per HIRR information (Ed., 9/23/2011)  Limilton, Douglas (Wyle)  Rushy, Thomas (Henry Ford Hospital)	<b>Human Research Program Elements:</b>	(1) <b>ExMC</b> :Exploration Medical Capabilities		
Space Biology Cross-Element Discipline: Space Biology Special Category: None  PI Email:  sdutchat @hfbs.org  Fax: FY 313 916 9445  PI Organization Type: PUBLIC SERVICE Phone: 313 916 9306  Organization Name: Henry Ford Health System  PI Address 1: Surgery PI Address 2: 2799 W. Grand Boulevard, CFP-1  PI Web Page: City: Detroit State: MI  Zip Code: 4820-2608 Congressional District: 13  Comments: Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NNJ07ZSA002N  Start Date: 08/15/2008 End Date: 09/20/2011 No. of PhD Degrees: 0  No. of Master's Candidates: 0 No. of Bachelor's Candi	Human Research Program Risks:	that occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures		
Discipline: "Source Space Biology Special Category: None   Space Biology Special Category: None   PI Email: Stutchal@fifths.org   Fax: FY 313 916 9445   PI Organization Type: PUBLIC SERVICE   Phone: 313 916 9306   Organization Name: Henry Ford Health System   PI Address 1: Surgery   PI Address 2: 2799 W. Grand Boulevard, CFP-1   PI Web Page:   Otto: State: MI   Zip Code: 48202-2608   Congressional District: 13   Comments:   Project Type: GROUND   Solicitation / Funding Source: 2007 Crew Health NNI07ZSA002N   Start Date: 08/15/2008   End Date: 09/20/2011   No. of Pst Dost Dost: 0   No. of PhD Degrees: 0   No. of PhD Dardidates: 0   No. of Master' Degrees: 0   No. of Master's Candidates: 0   No. of Bachelor's Degrees: 0   No. of Bachelor's Candidates: 0   No. of Bachelor's Degrees: 0   No. of Bachelor's Candidates: 0   Monitoring Center: NASA JSC   Contact Monitor: Warkins, Sharmila   Contact Phone: 281.483.0395   Elight Program:   NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)   Key Personnel Changes/Previous PI:   None   Amponsah, David (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Henry Ford Hospital )   Sargyan, Ashot (Wyle)   Knuth, Thomas (Hen	Space Biology Element:	None		
PI Email:	Space Biology Cross-Element Discipline:	None		
PI Organization Type: PUBLIC SERVICE Phone: 313 916 9306 Organization Name: Henry Ford Health System PI Address 1: Surgery PI Address 2: 2799 W. Grand Boulevard, CFP-1 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: 08/15/2008 End Date: 09/20/2011 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 No. of Bachelor's Degrees: 0 No. of Bachelor's Candidates: 0 Maintoning Center: NASA JSC Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395 Contact Email: sharmila watkins@nasa.gov Flight Program: Flight Assignment: NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011) NOTE: change in Gaps per HRR information (Ed., 9/23/2011) COI Name (Institution): Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle) Cordonance Goal No.:	Space Biology Special Category:	None		
Organization Name: Henry Ford Health System  PI Address 1: Surgery  PI Address 2: 2799 W. Grand Boulevard, CFP-1  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: 08/15/2008 End Date: 09/20/2011  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 No. of Bachelor's Degrees: 0  Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395  Contact Email: Sharmila watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  Amponsalb, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Surgsyan, Ashot (Wyle)  NNX08AV74A  Performance Goal No.:	PI Email:	sdulcha1@hfhs.org	Fax:	FY 313 916 9445
Pl Address 1:   Surgery   2799 W. Grand Boulevard, CFP-1     Pl Web Page:   City:   Detroit   State:   MI     Zip Code:   48202-2608   Congressional District:   13     Comments:   Comm	PI Organization Type:	PUBLIC SERVICE	Phone:	313 916 9306
PI Address 2: 2799 W. Grand Boulevard, CFP-1  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: 08/15/2008 End Date: 09/20/2011  No. of Post Does: 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: NASA JSC  Contact Monitor: Watkins, Sharmi la Contact Phone: 28.1.483.0395  Contact Email: sharmila watkins@nasa.gov  Flight Program:  Key Personnel Changes/Previous PI: None  Amponsah, David (Henry Ford Hospital )  Hamilton, Douglas (Wyle)  Sargsyan, Asbot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	Organization Name:	Henry Ford Health System		
P1 Web Page:   City:	PI Address 1:	Surgery		
City:         Detroit         State:         MI           Zip Code:         48202-2608         Congressional District:         13           Comments:         Project Type:         GROUND         Solicitation / Funding Source:         2007 Crew Health NNJ07ZSA002N           Start Date:         08/15/2008         End Date:         09/20/2011           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:         NASA JSC           Contact Monitor:         Watkins, Sharmila         Contact Phone:         281.483.0395           Contact Email:         sharmila.watkins@nasa.gov         281.483.0395           Flight Program:         NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)           Key Personnel Changes/Previous PI:         None           COI Name (Institution):         Amponsah, David (Henry Ford Hospital ) Hamilton, Douglas (Wyle) (Myle)         Hamilton, Douglas (Wyle)           Kunth, Thomas (Henry Ford Hospital ) Sargsyan, Ashot (Wyle)         None (Marchall of Henry Ford Hospital ) Hamilton, Daving (Myle)         Non	PI Address 2:	2799 W. Grand Boulevard, CFP-1		
Zip Code: 48202-2608 Congressional District: 13  Comments:  Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NNJ07ZSA002N  Start Date: 08/15/2008 End Date: 09/20/2011  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: NASA JSC  Contact Monitor: Watkins, Sharmi1a Contact Phone: 281.483.0395  Contact Email: sharmila watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  COI Name (Institution): Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	PI Web Page:			
Comments:  Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NNJ07ZSA002N  Start Date: 08/15/2008 End Date: 09/20/2011  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: NASA JSC  Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395  Contact Email: sharmila.watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  Amponsah, David (Henry Ford Hospital)  Hamilton, Douglas (Wyle)  Knuth, Thomas (Henry Ford Hospital)  Sargsyan, Ashot (Wyle)  NNX08AV74A  Performance Goal No.:	City:	Detroit	State:	MI
Project Type: GROUND Solicitation / Funding Source: 2007 Crew Health NNJ07ZSA002N Start Date: 08/15/2008 End Date: 09/20/2011  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: NASA JSC  Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395  Contact Email: sharmila.watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  COI Name (Institution): Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	Zip Code:	48202-2608	Congressional District:	13
Start Date: 08/15/2008 End Date: 09/20/2011  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: NASA JSC  Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395  Contact Email: sharmila.watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  Amponsah, David (Henry Ford Hospital)  Hamilton, Douglas (Wyle)  Knuth, Thomas (Henry Ford Hospital)  Sargsyan, Ashot (Wyle)  Sargsyan, Ashot (Wyle)  Performance Goal No.:	Comments:			
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: NASA JSC Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395 Contact Email: sharmila.watkins@nasa.gov Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011) NOTE: change in Gaps per HRR information (Ed., 9/23/2011) NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle) NNX08AV74A  Performance Goal No.:	Project Type:	GROUND	<b>Solicitation / Funding Source:</b>	2007 Crew Health NNJ07ZSA002N
No. of PhD Candidates:  0	Start Date:	08/15/2008	End Date:	09/20/2011
No. of Master's Candidates:  0	No. of Post Docs:	0	No. of PhD Degrees:	0
No. of Bachelor's Candidates:  O Monitoring Center: NASA JSC  Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395  Contact Email: sharmila.watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  COI Name (Institution): Amponsah, David (Henry Ford Hospital)  Hamilton, Douglas (Wyle)  Knuth, Thomas (Henry Ford Hospital)  Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	No. of PhD Candidates:	0	No. of Master' Degrees:	0
Contact Monitor: Watkins, Sharmila Contact Phone: 281.483.0395  Contact Email: sharmila.watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  COI Name (Institution): Amponsah, David (Henry Ford Hospital)  Hamilton, Douglas (Wyle)  Knuth, Thomas (Henry Ford Hospital)  Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	No. of Master's Candidates:	0		
Contact Email: sharmila.watkins@nasa.gov  Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	No. of Bachelor's Candidates:	0	<b>Monitoring Center:</b>	NASA JSC
Flight Program:  NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI:  None  Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.:  NNX08AV74A  Performance Goal No.:	Contact Monitor:	Watkins, Sharmi1a	Contact Phone:	281.483.0395
NOTE: End date changed to 9/20/2011 (from 8/14/2011) per NSSC information (Ed., 9/23/2011)  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI: None  COI Name (Institution): Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	Contact Email:	sharmila.watkins@nasa.gov		
Flight Assignment:  NOTE: change in Gaps per HRR information (Ed., 9/23/2011)  Key Personnel Changes/Previous PI:  None  Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.:  NNX08AV74A  Performance Goal No.:	Flight Program:			
Amponsah, David (Henry Ford Hospital) Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.: NNX08AV74A  Performance Goal No.:	Flight Assignment:			(Ed., 9/23/2011)
COI Name (Institution):  Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital) Sargsyan, Ashot (Wyle)  Grant/Contract No.:  NNX08AV74A  Performance Goal No.:	Key Personnel Changes/Previous PI:	None		
Performance Goal No.:	COI Name (Institution):	Hamilton, Douglas (Wyle) Knuth, Thomas (Henry Ford Hospital)		
	Grant/Contract No.:	NNX08AV74A		
Performance Goal Text:	Performance Goal No.:			
	Performance Goal Text:			

Task Book Report Generated on: 04/26/2024

Crew members on long duration space missions are at significant risk of decreased strength of bones despite counter-measures. The radiographic capabilities of future spacecraft are unknown, however, ultrasound is currently operational on the ISS. Preliminary investigations have shown that ultrasound can reliably diagnose long bone fractures. This proposal will evaluate the accuracy of ultrasound in the diagnosis of bony fractures and develop just in time, training methods to allow astronauts to perform and interpret skeletal ultrasound to answer the specific aims:

1. Evaluate the diagnostic accuracy of ultrasound for bony fractures and fracture healing in ground based studies.

- 2. Develop training programs to facilitate skeletal ultrasound to exclude fracture.
- 3. Develop pattern recognition algorithms to allow astronauts to autonomously diagnose skeletal fracture.

#### Methods:

Task Description:

Specific Aim 1: The accuracy of ultrasound will be evaluated against X-ray in a large cohort of acutely injured patients at the Level 1 trauma center at Henry Ford Hospital. Ultrasound examinations will be performed by experts in parallel with astronaut equivalents on patients with a history and exam consistent with bony fracture to assess sensitivity and specificity and optimize technique. The randomized trials will include patient groups with probable long bone, axial skeletal, and hand/foot fractures to allow statistical conclusions about exam accuracy to be determined.

Specific Aim 2: A computer based ultrasound training program will be developed for astronauts to allow skeletal ultrasound to be performed for axial and extremity fractures based on a successful Onboard Proficiency Enhancement (OPE) program.

Specific Aim 3: Autonomous ultrasound diagnostic capabilities will be developed for astronauts by combining cue card reference images, topographic ultrasound guides, and normal/anticipated pathologic images to allow pattern recognition diagnosis by the operators.

Significance to NASA: This proposal will develop training and techniques for autonomous/remote guidance of in-flight fracture diagnosis using crew performed skeletal ultrasound.

#### **Rationale for HRP Directed Research:**

### **Research Impact/Earth Benefits:**

A large scale analysis of our data has demonstrated that point of care ultrasound is a rapid, accurate, and reproducible test to diagnose acute injury to the musculoskeletal system. This technique can be used by non-experts to rapidly diagnose injuries to the upper and lower extremities, chest, and hands/feet to guide therapy. This technique can be expanded for use in the pre-hospital setting, in military conflicts, and in natural disasters to aid triage decisions.

Our preliminary data were reviewed by 2 musculoskeletal ultrasound experts (Marnix van Holsbeeck MD, and Antonio Bouffard MD) for training of operators, technical details, and data results. Our preliminary suggests that 2D ultrasound has appropriate sensitivity and specificity for the wide range of musculoskeletal injuries which may occur during LEO or exploration class spaceflight. Newer technologies such as volumetric or 3D ultrasound may provide additional precision for complex fractures or for operators without access to just in time training programs, however, these theoretic benefits have not been substantiated to date. Additional trials of 3D ultrasound in musculoskeletal trauma could be included in the subsequent funding year, however, this would impact the timeline and cost of this proposal. The interim analysis concluded that 2D ultrasound provides acceptable sensitivity and specificity for the diagnosis of musculoskeletal trauma and that 3D or volumetric ultrasound is not necessary at this time.

PROGRESS:

We have screened approximately 720 patients for enrollment into the Fracture Study in the emergency room at Henry Ford Hospital. Initial patient screening was done by Trauma Surgery or Emergency Medicine staff based on mechanism of injury, history, and presenting signs and symptoms suggestive of significant musculoskeletal injury. Informed consent was obtained and a localized ultrasound examination was completed prior to radiographic evaluation by MSK experts or minimally trained personnel using a 10.5 MHz linear probe. The ultrasound examination was initially done on the contra lateral, non-injured side to obtain a reference image and to optimize visualization and focal zone. The entire length of the bone was visualized with special attention to the injured area. A positive scan consisted of identification of cortical disruption or discontinuity. Secondary hematomas and muscular injury were also recorded. Routine radiographic imaging was then completed for comparison against the ultrasound examination.

Demographic, anatomic, and radiographic information were collected for correlation to the ultrasonographic findings. A diagnostic scoring sheet with patient and exam specific data was filled out by the operator immediately following the examination. High fidelity ultrasound images/video loops were also archived for later blinded review. The sensitivity and specificity of the test was determined for the operator and the blinded reviewer. Statistical analysis of the examinations was determined for the operator and the blinded reviews and correlated with radiographic findings by Chi Square analysis with Kappa correction.

The majority (76%) of the patients entered into the study were male with an average age of 38 (range 18-84). The majority of injuries involved falls (72%), followed by motor vehicle accidents (19%) and assaults (7%)

This trial used a blend of expert and non-expert operators to scan the patients with musculoskeletal trauma. The non-expert users received a 1 hour targeted instruction in MSK ultrasound prior to scanning. There was no appreciable difference in examination quality or diagnostic accuracy between expert and novice users in this limited trial (Appendix). The overall sensitivity of ultrasound for the detection of fractures was 96% and the specificity was 99% in this targeted trial. Subgroup analysis shows that the sensitivity is less for fractures in the hand and foot (86%) which is most likely related to the complexity of the examination in this area. There were a limited number of examinations of the femur and hip making statistical analysis impractical, however, observations of this technique suggest that it could be reliable if appropriate attention is given to technical factors including probe selection and depth in larger patients.

We have also evaluated fracture healing in a limited number of patients with hand and rib injuries. Fracture callus formation is readily apparent at 3-4 weeks and the maturation of the bony healing can be followed over a more prolonged period with specific ultrasound findings. 2D ultrasound provides a sensitive and specific point of care examination for long bone MSK injury when performed by expert and non-expert operators. Additional information is necessary to determine the accuracy of the test for fractures in complex areas (wrist, foot) or the potential benefit of 3D

Task Progress:

Task Book Report Generated on: 04/26/2024

ultrasound technologies.

# NEXT STEPS:

This trial was done by experts and non-experts in a limited population of patients with MSK injury. We would like to continue to accrue patients in the subsets with small numbers to provide a more robust analysis and to begin work on Specific Aim II to develop a multi-media, point of care training program which would be suitable for NASA Space Medicine user groups and for Crew Medical Officers.

SPECIFIC AIM 2: Develop robust, point-of-care training programs to facilitate the performance of skeletal ultrasound by non-physician CMOs to exclude fracture.

## NASA DELIVERABLES:

- Computer based, CMO training program to perform skeletal ultrasound to diagnose skeletal injury
- Cue card functionality to enhance rapid performance of skeletal ultrasound

**Bibliography Type:** 

Description: (Last Updated: 02/23/2023)