

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE FEBRUARY 2008
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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 2	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160407BB Special Operations Forces (SOF) Medical Technology Development/S275
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COST (Dollars in Millions)	FY07	FY08	FY09	FY10	FY11	FY12	FY13	Cost to Complete	Total Cost
PE1160407BB	2.234	2.327	2.459	2.495	2.547	2.603	2.661	Cont.	Cont.
S275, SOF MEDICAL TECHNOLOGY	2.234	2.327	2.459	2.495	2.547	2.603	2.661	Cont.	Cont.

A. Mission Description and Budget Item Justification: This program element provides studies, non-system exploratory advanced technology development, and evaluations. The focus is on medical technologies, centering on physiologic, psychologic, and ergonomic factors affecting the ability of Special Operations Forces (SOF) to perform their missions. Special operations requires unique approaches to combat casualty care, medical equipment, and other life support capabilities including life support for high altitude parachuting, combat swimming, and other SOF unique missions. This program provides guidelines for the development of selection and conditioning criteria, thermal protection, decompression procedures, combat casualty procedures, and life support systems. The program supports the development and evaluation of biomedical enhancements for the unique requirements of all SOF in the conduct of their diverse missions.

B. Program Change Summary:

	FY07	FY08	FY09
Previous President's Budget	2.234	2.388	2.464
Current President's Budget	2.234	2.327	2.459
Total Adjustments	0.000	-0.061	-0.005
Congressional Program Reductions		-0.015	
Congressional Increases			
Reprogrammings			
Other Program Adjustments			-0.005
SBIR Transfer		-0.46	

Funding:

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<p>FY07: No change.</p> <p>FY08: Congressional reduction includes (-\$0.004 million) Section 8097 and Section 8104 (-\$0.011 million). Other program adjustments include transfer to Small Business Innovative Research account (-\$0.046 million).</p> <p>FY09: Decrease of (-\$0.005 million) is due to economic inflation adjustments.</p> <p>Schedule: None.</p> <p>Technical: None.</p>	

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Cost (\$ in millions)	FY07	FY08	FY09	FY10	FY11	FY12	FY13
SOF Medical Technology	2.234	2.327	2.459	2.495	2.547	2.603	2.661
RDT&E Articles Quantity							

A. **Mission Description and Budget Item Justification:** This project provides studies, non-system exploratory advanced technology development and evaluations. The focus is on medical technologies, centering on physiologic, psychologic, and ergonomic factors affecting the ability of Special Operations Forces (SOF) to perform their missions. Special operations requires unique approaches to combat casualty care, medical equipment, and other life support capabilities including life support for high altitude parachuting, combat swimming, and other SOF unique missions. This project provides guidelines for the development of selection and conditioning criteria, thermal protection, decompression procedures, combat casualty procedures, and life support systems. The project supports the development and evaluation of biomedical enhancements for the unique requirements of all SOF in the conduct of their diverse missions. This effort is defined by the following seven areas of investigation:

- **Combat casualty management will:** (1) review the emergency medical equipment currently used in the SOF community and compare it to currently available civilian technology, and provide field testing of emergency medical equipment in the adverse environmental conditions encountered by SOF; (2) evaluate current tactical combat casualty care doctrine to ensure consideration of the wide variety of tactical scenarios encountered, and apply the latest concepts in casualty care to these circumstances; (3) apply lessons learned from recent combat operations to enhance medical capabilities; and (4) develop CD-ROM and internet compatible automated programs to provide the capability to perform medical interviews in multiple foreign languages and support SOF medical personnel information needs while operating in austere locations.

- **Decompression procedures for SOF diving operations will:** (1) decrease the decompression obligation in SOF diving operations through the use of surface-interval oxygen breathing; (2) provide the basis for extended mission profiles; and (3) investigate pre-oxygenation requirements for high-altitude SOF parachute operations, as well as ground operations at extreme altitudes.

- **Exercise-related injuries will evaluate the effectiveness of applying sports medicine diagnostic, therapeutic and rehabilitative techniques in management of the traumatic and overuse injuries commonly encountered among SOF.**

- **Inhaled gas toxicology will evaluate the feasibility of using pharmacologic intervention to reduce or eliminate the possibility of central nervous system toxicity.**

- **Medical sustainment training techniques will:** (1) examine novel ways of providing and documenting medical sustainment training for SOF corpsmen and physicians; (2) provide capabilities to rapidly develop new protocol and equipment instructions; and (3) develop a system

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for constantly upgrading the expertise of SOF medical personnel by incorporating new research reports and clinical information into a CD-ROM based computer system that can be used by medical personnel in isolated duty circumstances.

- Thermal protection research into various ensemble clothing and devices that may potentially enhance SOF operator performance.
- Mission-related physiology will: (1) develop accurate measures to evaluate SOF mission-related performance; (2) delineate nutritional strategies designed to help personnel apply known nutritional concepts to optimize performance in mission and training scenarios; (3) evaluate potential ergogenic agents as they apply to enhancing mission-related performance; (4) study the safety and efficacy of various substances to increase performance in sustained operations; (5) study interfaces of new vision devices with refractive vision enhancements; and (6) study pharmacologic measures to prevent acute mountain sickness in high altitude SOF air and ground operations.

B. Accomplishments/Planned Program

	FY07	FY08	FY09
Combat Casualty Care	.895	.632	.665
RDT&E Articles Quantity			

FY07 Completed ongoing studies: Tactical Combat Casualty Care Technology Transition Initiative. Initiated new studies: Recombinant Hemostatic Agents for Penetrating Brain Injury, Testing and Field Evaluations of the Welch Allyn (WA) Propaq LT for use by SOF, and Wearable Low-Power Plasma Knife.
 FY08 Completes ongoing studies: Testing and Field Evaluations of the WA Propaq LT for use by SOF and Wearable Low-Power Plasma Knife. Continues ongoing studies: Recombinant Hemostatic Agents for Penetrating Brain Injury. Initiates new studies: SOCOM Lab Set.
 FY09 Completes ongoing studies: Recombinant Hemostatic Agents for Penetrating Brain Injury, SOCOM Lab Set. Initiates new studies: Develop Mission Essential Elements for Enroute Care.

	FY07	FY08	FY09
Diving Medicine	.124	.170	.179
RDT&E Articles Quantity			

FY07 Initiated new studies: Intravenous Perfluorocarbon and Recompression Therapy After the Onset of Severe Decompression Sickness.
 FY08 Continues ongoing studies: Intravenous Perfluorocarbon and Recompression Therapy After the Onset of Severe Decompression Sickness.
 FY09 Completes ongoing studies: Intravenous Perfluorocarbon and Recompression Therapy After the Onset of Severe Decompression Sickness.

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			FY07	FY08	FY09
Medical Informatics			.220	.254	.365
RDT&E Articles Quantity					
<p>FY07 Completed ongoing studies: SOF Medical Training Presentations. Continued ongoing studies: SOF Nutrition Training Material for USSOCOM and Advanced Distant Learning for 18D Course of Instruction. Initiated new studies: SOF Medical Lessons Learned, and The History of the Development of the SOF Medic.</p> <p>FY08 Completes ongoing studies: SOF Nutrition Training Material for USSOCOM, Advanced Distant Learning for 18D Course of Instruction and The History of the Development of the SOF Medic. Continues ongoing studies: SOF Medical Lessons Learned.</p> <p>FY09 Completes ongoing studies as follows: SOF Medical Lessons Learned. Initiates new studies: Update SOF/Joint Medical Doctrine and Procedures.</p>					
			FY07	FY08	FY09
Performance Enhancements			.995	1.271	1.250
RDT&E Articles Quantity					
<p>FY07 Completed ongoing studies: Visual Aberration in Post-Corneal Refractive Surgery Patients using Panoramic Night Vision Goggles and Efficacy of Dehydroepiandrosterone Administration to Protect Soldiers Against Stress Induced Defects in Memory and Cognition. Continued ongoing studies: Prevention of Motion Sickness in SOF Operations. Initiated new studies: Comparison of Flight Proficiency and Risk Taking Behavior in Aviators Given Dextroamphetamine or Modafinil during Extended Operations, Altitude Decompression Sickness Risk Assessment Computer Upgrade - Staged In-Flight Decompression, and Effect of Exogenous Erythropoietin on Acute Mountain Sickness Symptoms in Humans.</p> <p>FY08 Completes ongoing studies: Prevention of Motion Sickness in SOF Operations and Altitude Decompression Sickness Risk Assessment Computer Upgrade - Staged In-Flight Decompression. Continues ongoing studies: Comparison of Flight Proficiency and Risk Taking Behavior in Aviators Given Dextroamphetamine or Modafinil during Extended Operations and Effect of Exogenous Erythropoietin on Acute Mountain Sickness Symptoms in Humans. Initiates new studies: Anti-Clotting Agents, Biomarkers and Dynamical Function Tests for Optimized Health and Performance, Physical Performance Trainability Limits on SOF Standards used for Recruitment and Initial Selection and Metabolic Markers to Develop Assays and Optimize Warfighter Fitness.</p> <p>FY09 Completes ongoing: Comparison of Flight Proficiency and Risk Taking Behavior in Aviators Given Dextroamphetamine or Modafinil during Extended Operations, Effect of Exogenous Erythropoietin on Acute Mountain Sickness Symptoms in Humans and Anti-Clotting Agents. Continues ongoing studies: Biomarker and Dynamical Function Tests for Optimized Health and Performance, Physical Performance Trainability Limits on SOF Standards used for Recruitment and Initial Selection and Metabolic Markers to Develop Assays and Optimize Warfighter Fitness. Initiates new studies: Ergogenics and Ergonomics, and Operational Performance in Adverse Environment Studies.</p>					

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C. Other Program Funding Summary. None.

D. Acquisition Strategy. N/A.