

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE FEBRUARY 2004				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 2			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160407BB Special Operations Forces (SOF) Medical Technology Development						

COST (Dollars in Millions)	FY03	FY04	FY05	FY06	FY07	FY08	FY09	Cost to Complete	Total Cost
PE1160407BB	3.317	5.182	2.162	2.171	2.211	2.298	2.370	Cont.	Cont.
S275, SOF MEDICAL TECHNOLOGY	3.317	5.182	2.162	2.171	2.211	2.298	2.370	Cont.	Cont.

**Note: In FY 2003 this program element was budgeted for in Budget Activity 7. Beginning in FY 2004, this program element has been moved into Budget Activity 2.**

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. Current equipment and technology does not meet force requirements. The unique nature of 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:

	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>
Previous President's Budget	3.339	1.961	2.167
Current President's Budget	3.317	5.182	2.162
Total Adjustments	-0.022	3.221	-0.005
Congressional Program Reductions		-0.057	
Congressional Increases		3.400	
Reprogrammings	-0.022		-0.005
SBIR Transfer		-0.122	

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<p>Funding:</p> <p>FY04</p> <p>Reflects \$3.400 million for Rebreather, a Congressionally added program.</p> <ul style="list-style-type: none"> <li>- SBIR (-\$.077M)</li> <li>- Congressional Sectionals (-\$.036M)</li> </ul> <p>FY05</p> <p>Decrease of \$.005 million is based on current inflation factors.</p> <p>Schedule: N/A.</p> <p>Technical: N/A.</p>	

<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date: FEBRUARY 2004
Appropriation/Budget Activity RDT&E BA #2	SOF Medical Technology/Project S275	

Cost (\$ in millions)		FY03	FY04	FY05	FY06	FY07	FY08	FY09
SOF Medical Technology		3.317	5.182	2.162	2.171	2.211	2.298	2.370
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. Current equipment and technology does not meet force requirements. The unique nature of 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; and (3) develop CD-ROM and internet compatible automated programs to support SOF medical personnel information needs while operating in austere locations and medical interviews in multiple foreign languages.
- Decompression procedures for SOF diving operations will: (1) decrease the decompression obligation in SOF diving operations through the use of surface-interval oxygen breathing; and (2) investigate pre-oxygenation requirements for high-altitude SOF parachute operations.
- 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.

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- Medical sustainment training techniques will: (1) examine novel ways of providing and documenting medical sustainment training for SOF corpsmen and physicians; and (2) develop a system for constantly upgrading the medical expertise of SOF medical personnel by incorporating new research reports and clinical information into a CD-ROM based computer system which can be used by medical personnel in isolated duty circumstances.
- Thermal protection will evaluate the efficacy of current thermal protective measures in maintaining combat swimmer 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) develop a quantitative test for night vision suitable for screening SOF candidates and study ways to enhance unaided night vision; and (6) study pharmacologic measures to prevent acute mountain sickness in high altitude SOF operations.

#### B. Accomplishments/Planned Program

	FY03	FY04	FY05
Ongoing Studies	.741	.798	.918
RDT&E Articles Quantity			
<p>FY03 Completed ongoing studies as follows: Impact of Breathing Gas Mixtures on Decompression Sickness (DCS) in CV-22, LASIK in Special Operations BUD/S, SOF Committee on Tactical Combat Casualty Care, Combat Casualty After-Action Review, Antibiotic Prophylaxis, and Operational Medicine CD-ROM upgrade. Continue ongoing studies as follows: Treatment Standards for DCS/Arterial Gas Embolism (AGE), Bronchoalveolar Lavage in SIPE, Cardiopulmonary Function in SIPE, ASDS/UBA, SOF Mission Related Performance Measures Upgrade, Decompression Computer Diving Surveillance and Configuration Management Program, and Polymer Splint.</p> <p>FY04 Complete ongoing studies as follows: Effects of Post-Stress Carbohydrate Administration on Recovery, Treatment Standards for DCS/AGE, Bronchoalveolar Lavage in SIPE, Cardiopulmonary Function in SIPE, ASDS/UBA, SOF Mission Related Performance Measures Upgrade, and Effects of Low-Grade Hypoxia at Night in SOF Aircraft Operations. Continue ongoing studies as follows: Evaluation of HydroTech Aqua Heat System during SEAL Delivery Vehicle (SDV) Operations, Medical Support of High Speed Boat (HSB) Shock Mitigation, Stress Fractures in BUD/S Training, Computer-Assisted Thermal Protection Training in SOF, Polymer Splint, Development of Algorithms for Remote Triage, Decompression Computer Diving Surveillance and Configuration Management Program, and Evaluation of Nasal Ketamine for Pain Control.</p>			

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<p>FY05 Complete ongoing studies as follows: Evaluation of HydroTech Aqua Heat System during SDV Operations, Stress Fractures in BUD/S Training, Computer-Assisted Thermal Protection Training in SOF, Tympanic Membrane Injuries, Evaluation of Nasal Ketamine for Pain Control, Medical Support of HSB Shock Mitigation, Polymer Splint, and Decompression Computer Diving Surveillance and Configuration Management Program. Continue ongoing studies as follows: Hypoxic Exposures to Improve Performance at Altitude, Comparison of Wavefront-Guided Photo-Refractive Keratectomy (PRK) and LASIK/LASER Epithelial Keratomileusis (LASEK), SOF Performance Enhancing Drug Protocols, Cold Sterilization, Development of Algorithms for Remote Triage, and Combat Casualty Care Research After-Action Review.</p>			
	FY03	FY04	FY05
New Studies	1.103	1.097	1.244
RDT&E Articles Quantity			
<p>FY03 Initiated new studies as follows: Evaluation of HydroTech Aqua Heat System during SDV Operations, Medical Support of High Speed Boat Shock Mitigation, Development of Algorithms for Remote Triage, Stress Fractures in BUD/S Training, Computer-Assisted Thermal Protection Training in SOF, Full Face Purging Procedures for the MK25 UBA, Effects of Low Grade Hypoxia at Night in SOF Aircraft Operations, Evaluation of Nasal Ketamine for Pain Control, and Effects of Post-Stress Carbohydrate Administration on Recovery. Completed new studies as follows: Full Face Purging Procedures for the MK25 UBA.</p> <p>FY04 Initiate new studies as follows: Hypoxic Exposures to Improve Performance at Altitude, Comparison of Wavefront-Guided Photo-Refractive Keratectomy (PRK) and LASIK/LASER Epithelial Keratomileusis (LASEK), SOF Performance Enhancing Drug Protocols, Cold Sterilization, Tympanic Membrane Injuries, and Combat Casualty Care Research After-Action Review.</p> <p>FY05 Initiate new studies as follows: Combat Casualty Care Pain Management Protocols, Efficacy of Dehydro-Epi-Androsterone (DHEA) Administration to Protect Soldiers against Stress-Induced Deficits in Memory and Cognition, Protocols and Techniques for New Equipment and Technologies within SOF, Hypobaric Medicine, Performance Enhancements, Chemical/Biological Markers, Medical Research and Development Enhancements for Non-Medical Systems, Remote Telemetry Patient Monitoring/Casualty Assessment, Rapid Diagnostic Systems, Casualty Retrieval Devices, Advanced Combat Casualty Care Procedures, Blunt Trauma Injuries, Improved Tourniquets, Interactive SOF Medical Distant Learning, and Graduate Research. Complete new studies as follows: Graduate Research.</p>			
	FY03	FY04	FY05

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Rebreather		1.233	3.287	
RDT&E Articles Quantity				
<p>FY03 This initiative was a Congressional Plus-Up. Continued development of a closed circuit UBA control unit, and novel oxygen and carbon dioxide sensors based on new technologies.</p> <p>FY04 This initiative is a Congressional Plus-Up. Continues development of underlying technologies that will support the Advanced Technology underwater breathing apparatus project.</p>				
		FY03	FY04	FY05
SO Medical Diagnostic System		.240		
RDT&E Articles Quantity				
<p>FY03 This initiative was a Congressional Plus-Up. Initiated a program of Knowledge Based Rules to assist in providing SOF medics with an automated diagnostic decision tree. Complete integration of diagnostics included Gastrointestinal, Respiratory, Dermatology and Musculoskeletal/Sports Medicine algorithms, and incorporation into a hand-held device.</p>				
<p>C. Other Program Funding Summary. None.</p> <p>D. Acquisition Strategy. N/A.</p>				