

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE FEBRUARY 2003					
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)	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	Cost to Complete	Total Cost
PE1160407BB	4.883	3.339	1.961	2.167	2.177	2.216	2.299	2.367	Cont.	Cont.
S275, SOF MEDICAL TECHNOLOGY	4.883	3.339	1.961	2.167	2.177	2.216	2.299	2.367	Cont.	Cont.

Note: In FY 2002 and 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>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>
Previous President's Budget	4.017	1.962	1.994	2.232
Current BES/President's Budget	4.883	3.339	1.961	2.167
Total Adjustments	0.866	1.377	-0.033	-0.065
Congressional Rescissions		-0.085		
Congressional Increases		1.550		
Reprogrammings	0.992			
SBIR/STTR Transfer	-0.126	-0.088		

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<p>Funding:</p> <p>FY02</p> <ul style="list-style-type: none"> - Reflects a \$1.000 million adjustment for a congressionally added program that is more appropriately executed in a different Program Elements (PE): - Rebreather from PE 1160404BB (\$1.000). <p>FY03</p> <ul style="list-style-type: none"> - Reflects \$1.550 million for Congressionally added programs as follows: - Rebreather (\$1.300) - Special Operations Medical Diagnostic Tool (\$0.250). <p>FY04 and FY05</p> <ul style="list-style-type: none"> - Revised Economic Assumptions. <p>Schedule: None.</p> <p>Technical: None.</p>	

Exhibit R-2a, RDT&E Project Justification		Date: FEBRUARY 2003
Appropriation/Budget Activity RDT&E BA # 2	SOF Medical Technology/Project S275	

Cost (\$ in millions)	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09
SOF Medical Technology	4.883	3.339	1.961	2.167	2.177	2.216	2.299	2.367
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

	FY02	FY03	FY04	FY05
Ongoing Studies	.721	.741	.748	.918
RDT&E Articles Quantity				

FY02 Completed ongoing studies as follows: SOF Medical Skills Utilization, Protective Barrier Substances for Coelenterate Envenomation and Extended Pulmonary O₂ Limits. Continued ongoing studies as follows: Impact of Breathing Gas Mixtures on Decompression Sickness (DCS) in CV-22, Laser-Assisted In-Situ Keratomileusis (LASIK) in Special Operations Basic Underwater Demolition School (BUD/S), Advanced SEAL Delivery System (ASDS)/Underwater Breathing Apparatus (UBA), Bronchoalveolar Lavage in Swimming Induced Pulmonary Edema (SIPE), and Cardiopulmonary Function in SIPE.

FY03 Complete ongoing studies as follows: Impact of Breathing Gas Mixtures on DCS in CV-22, LASIK in Special Operations BUD/S, SOF Committee on Tactical Combat Casualty Care, Combat Casualty After-Action Review, ASDS/UBA, SOF Mission Related Performance Measures Upgrade, Decompression Computer Diving Surveillance and Configuration Management Program, and 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, and Polymer Splint.

FY04 Complete ongoing studies as follows: Treatment Standards for DCS/AGE, Bronchoalveolar Lavage in SIPE, Cardiopulmonary Function in

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<p>SIPE and Effects of Low-Grade Hypoxia at Night in SOF Aircraft Operations. Continue ongoing studies as follows: Mechanisms of Injury in Refractory DCS/AGE, Stress Fractures in BUD/S Training, Computer-Assisted Thermal Protection Training in SOF, and Polymer Splint, Development of Algorithms for Remote Triage, Evaluation of Nasal Ketamine for Pain Control, and Effects of Post-Stress Carbohydrate Administration on Recovery.</p>				
	FY02	FY03	FY04	FY05
New Studies	1.145	1.124	1.213	1.249
RDT&E Articles Quantity				
<p>FY02 Initiated new studies as follows: Caprine Analgesia, Operational Medicine CD-ROM Upgrade, Improving SOF Mission Performance/Mission Commander Training Package, One-handed tourniquet, SOF Committee on Tactical Combat Casualty Care, Combat Casualty Care After-Action Review, Polymer Splint, Treatment Standards for DCS/AGE, SOF Mission Related Performance Measures Upgrade, Antibiotic Prophylaxis, and Decompression Computer Diving Surveillance and Configuration Management Program. Completed new studies as follows: Caprine Analgesia, Improving SOF Mission Performance/Mission Commander Training Package, and One-handed tourniquet.</p> <p>FY03 Initiate new studies as follows: Mechanisms of Injury in Refractory DCS and AGE, Development of Algorithms for Remote Triage, Stress Fractures in BUD/S Training, Computer-Assisted Thermal Protection Training in SOF, Maximum Breath-hold Diving Duration, 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, Effects of Post-Stress Carbohydrate Administration on Recovery, and Graduate Research. Complete new studies as follows: Maximum Breath-hold Diving Duration, Full Face Purging Procedures for the MK25 UBA, and Graduate Research.</p> <p>FY04 Initiate new studies as follows: 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, Comparison of Wavefront-Guided Photo-Refractive Keratectomy (PRK) and LASIK/LASER Epithelial Keratomileusis (LASEK), Model Development for Missile Wound in Swine Latissimus, and Interactive SOF Medical Distant Learning.</p>				

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	FY02	FY03	FY04	FY05
Rebreather	.973	1.235		
RDT&E Articles Quantity				

FY02 This initiative was a Congressional Plus-Up. Funds were used to develop a closed circuit UBA control unit, and novel oxygen and carbon dioxide sensors based on new technologies.
 FY03 This initiative was a Congressional Plus-Up. Funds will be used to continue development of a closed circuit UBA control unit, and novel oxygen and carbon dioxide sensors based on new technologies.

	FY02	FY03	FY04	FY05
Air Force Medical	2.044			
RDT&E Articles Quantity				

FY02 This initiative was a Congressional Plus-Up transferring funds from Air Force Program Element 040411F. Funds were used for the following projects: Special Tactics Teams (STT) Musculoskeletal Injury Reduction Study, Operational Medicine Training CD-ROM on Laser Exposure, Emergency Evacuation Hyperbaric Stretcher, Identification of Biomarkers of Laser Injury to the Retina, Laser Eye Protection for STT, Effects on Modafinil on Warfighter Cognitive Performance during Escape and Evasion, and Combat Oxygen System Development.

	FY02	FY03	FY04	FY05
SO Medical Diagnostic System		.239		
RDT&E Articles Quantity				

FY03 This initiative was a Congressional Plus-Up. Funds will initiate a program of Knowledge Based Rules to assist in providing SOF medics with an automated diagnostic decision tree. Complete integration of diagnostics will include Gastrointestinal, Respiratory, Dermatology and Musculoskeletal/Sports Medicine algorithms, and incorporation into a hand-held device.

C. Other Program Funding Summary. None.

D. Acquisition Strategy. None.