

UNCLASSIFIED

FY 2004 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2003

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N
 PROGRAM ELEMENT TITLE: Medical Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0933 Medical / Dental Equipment Development	9,164	62,302	5,593	6,124	6,298	7,600	7,744	7,889	Continue	Continue
M2650 Voice Instructional Devices (VID)	5,821	0	0	0	0	0	0	0	0	5,821
M2896 Military Dental Research	2,761	2,933	0	0	0	0	0	0	0	5,694
M2897 High Resolution Digital Mammography	1,443	0	0	0	0	0	0	0	0	1,443
M2795 Coastal Cancer Control (MUSC)	3,396	4,452	0	0	0	0	0	0	0	7,848
Total	22,585	69,687	5,593	6,124	6,298	7,600	7,744	7,889	Continue	Continue

R-1 Line Item 134

Budget Item Justification
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A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

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PROGRAM CHANGE FOR TOTAL PE:

	<u>FY 2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY 2009</u>
(U) FY 2003 President's Budget	5,455	7,154	7,270	7,461	7,609	7,760	7,907	8,058
(U) Adjustments from PRESBUDG:								
VOICE INSTRUCTIONAL DEVICES (VID)	6,000							
COASTAL CANCER CONTROL	3,500	4,500						
MILITARY DENTAL RESEARCH	2,800	3,000						
HIGH RESOLUTION DIGITAL MAMMOGRAPHY	1,500							
SONARMAN EARCOM TECHNOLOGY	500							
NAVAL BLOOD RESEARCH LAB	1,000	1,500						
NAVAL MEDICAL RES CTR RADIATION	2,500							
Section 8123 : Management Reform	-205							
FY 2002 SBIR (dtd 5-15-02)	-245							
Post- Production R&D Continuation			-854	-1,080	-1,183			
Sec. 313, PL 107-206: Revised	-50							
FY02 BTR (July-02)	-108							
Business Process Reform (SEC. 813		-285						
Economic Assumptions (SEC. 813	-62	-400						
IT Cost Growth (SEC. 8109)		-131						
Biomedical Research Imaging Co		3,500						
Center for Disaster Management		2,975						
Community Hospital Telehealth		1,000						
Institute of Tech Biomedical Research		1,000						
Low Cost Retractable Needle		1,000						

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Medical Procedures Reference Tool		2,600						
Minimally Invasive Surgical Techniques		1,200						
National Bone Marrow Program		28,900						
	<u>FY 2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY 2009</u>
National Center for Collaboration in Medicine		2,250						
Rural Health		5,780						
Treatment of Radiation Sickness		3,400						
Vectored Vaccine Research Program		1,500						
Non-S&T R&D Offset			-597					
PSD203 ACTD offsets			-97	-125				
Inflation Savings		-756						
PBD-604 Nonpay Purchase Inflation			-99					
PBD-604 Nonpay Inflation			-30					
PBD 604 FY05/09 Inflation				-132	-128	-160	-163	-169
(U) FY 2004 President's Budget	22,585	69,687	5,593	6,124	6,298	7,600	7,744	7,889

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(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
M0933 Medical / Dental Equipment Development	9,164	62,302	5,593	6,124	6,298	7,600	7,744	7,889	Continue	Continue

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 2002 ACCOMPLISHMENTS:

- (U) (\$1,500) DNA VACCINE TECHNOLOGY: Completed studies of 9 plasmid (not 15 plasmid) vaccine in healthy adult subjects; completed clinical trials of new formulation of DNA vaccines designed to improve antibody responses. Project completed.
- (U) (\$1,530) TACTILE SITUATIONAL AWARENESS SYSTEM (TSAS): Complete development of additional lab and flight systems; completed unmanned aerial vehicle and fixed demonstrations and evaluations; continued rotary and fixed wing suits and pitch/roll algorithms; continued operational testing of suits.
- (U) (\$75) VIRTUAL FIT CHECK SYSTEM: Completed all data collection and analysis, and writing final report.

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- (U) (\$100) CERTIFICATION OF MEDICAL ANCILLARY EQUIPMENT FOR USE IN HYPERBARIC CHAMBERS: Completed accuracy testing of selected equipment and develop a list of items for submission to the Supervisor of Diving for inclusion on the authorized Navy list for hyperbaric use; writing final report.
- (U) (\$243) EVALUATION OF FIELD-BASED PROCEDURES FOR SCREENING DIVERS' AIR: Completed field testing of gas analysis equipment; writing final report.
- (U) (\$24) SEA TRIALS OF NEW SUBMARINE WATCHSTANDING SCHEDULE: Initiated a study to evaluate the effectiveness of a new watchstanding schedule on submariner performance; arranged for testing new schedule on two deployed submarines.
- (U) (\$179) UNDERWATER AND DIVE STATION WORK-SITE NOISE SURVEYS: Initiated study to determine the total noise exposure of Navy diving operations (surface and underwater combined) and establish recommendations for length of exposure that will not cause long-term hearing loss.
- (U) (\$80) FEASIBILITY OF USING HAND-HELD PERSONAL DIGITAL ASSISTANTS IN HYPERBARIC ENVIRONMENTS: Completed a study to evaluate the use of personal digital assistants (PDAs) to function in hyperbaric environments as a device for running the established Submarine Escape and Rescue Program (SEAREX).
- (U) (\$872) MERCURY ABATEMENT IN DENTAL WASTEWATER: Initiated and completed test and evaluation of several commercial mercury abatement systems for use in Navy Dental Treatment Facilities
- (U) (\$400) TACTICAL MEDICAL COORDINATING SYSTEM: Initiated field testing of a radio frequency device to track the location of casualties through the medical evacuation system. Effort being coordinated with other IM/IT initiatives and structured to be compatible with TMIP.
- (U) (\$250) SOF MOBILE PERFORMANCE EVALUATION TEST BATTERY: Initiated field testing of a refined research tool used for determining physical and cognitive performance decrements in special operations forces that result from fatigue or environmental exposure.
- (U) (\$0) ADVANCED FROZEN BLOOD PROCESSOR: Project not funded; BUMED never received research protocol from performer. Plan was to initiate clinical testing of an advanced frozen red blood cell processor that would prolong the shelf life of red cells after they have been thawed from 24 hours to 2 weeks.

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- (U) (\$2,456) NAVAL MEDICAL RESEARCH CENTER RADIATION EXPOSURE TREATMENT: Initiated studies to optimize the ability to expand blood forming stem cells in culture outside the body.
- (U) (\$966) NAVAL BLOOD RESEARCH LABORATORY: Conduct studies to obtain FDA approval use of platelets that have been frozen for up to five years.
- (U) (\$489) SONARMAN EARCOM TECHNOLOGY: Initiated development of a noise-reducing sealed earplug with acoustic and electronic systems that interface with wireless/wired communications systems to facilitate communications in noisy environments.

2. (U) FY 2003 PLAN:

- (U) (\$639) TACTICAL MEDICAL COORDINATION SYSTEM: Continue field testing of a radio frequency device (DogTag) to track the location of casualties through the medical evaluation system.
- (U) (\$340) SOF MOBILE PERFORMANCE EVALUATION TEST BATTERY: Continue field testing of a refined tool used for determining physical and cognitive performance decrements in special operations forces that result from fatigue or environmental exposure.
- (U) (\$230) UNDERWATER AND DIVE STATION WORK-SITE NOISE SURVEYS: Continue studies to determine the total noise exposure of Navy diving operations (surface and underwater combined) and establish recommendations for length of exposure that will not cause long-term hearing loss.
- (U) (\$260) SEA TRIALS OF NEW SUBMARINE WATCHSTANDING SCHEDULE: Continue study to evaluate the effectiveness of a new watchstanding schedule on submariner performance.
- (U) (\$1,171) TACTILE SITUATIONAL AWARENESS SYSTEM (TSAS): Complete final phase of field testing of TSAS suits in rotary wing aircraft to include pitch/roll algorithms. Discontinue fixed wing support portion of project. Writing final report and delivering product.
- (U) (\$117) COMPUTER ASSISTED MANAGEMENT OF FIELD DENTAL EMERGENCIES: Initiate and complete beta- and field testing of a software CD-ROM prototype that assists ancillary medical personnel in diagnosis and treatment of dental emergencies.

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PROGRAM ELEMENT TITLE: Medical Development

- (U) (\$176) DIVER COOLING SYSTEM FOR PERSONAL PROTECTIVE EQUIPMENT USED IN CONTAMINATED WATER DIVING: Initiate and complete testing of diving dry suits retrofitted with a COTS cooling system for diving in contaminated warm waters without heat exhaustion.
- (U) (\$246) USING ESP (ESTIMATING SUPPLIES PROGRAM) TO VALIDATE FLEET MARINE FORCE MEDICAL RESOURCE REQUIREMENTS: Initiate field testing of a computer application that provides medical planners with accurate consumable medical supplies to deliver based on type and volume of patient casualty stream.
- (U) (\$225) EVALUATION OF A NEW PORTABLE HEAT STRESS METER FOR USE IN THE US NAVY AND MARINE CORPS. Initiate and complete evaluation of new COTS heat stress meter.
- (U) (\$144) DVANCED ELECTRONIC STETHOSCOPE FOR GENERAL FIELD USE. Initiate and complete field testing of a prototype electronic stethoscope, which allows accurate vital sign monitoring by health care providers during environmental conditions with high background noise.
- (U) (\$1,954) MEDICAL DATA SURVEILLANCE AND NAVAL MEDICAL WATCH BOARD THREAT ALERT INTERFACE: Initiate testing of a C4I system that will create geographical displays of medical threat alerts.
- (U) (\$1,487) LONG RANGE RAID CASUALTY EVACUATION, EN ROUTE CARE, OPERATIVE FIELD DENTISTRY: Initiate field testing of critical care medical and dental equipment to execute current military operations.
- U) (\$2,907) CENTER FOR DISASTER MANAGEMENT: Provides education, training courses, research, scientific outreach, disaster preparedness, strategic planning and support to humanitarian operations
- (U) (\$28,240) NATIONAL BONE MARROW REGISTRY: Improves the donor matching system, which will speed up emergency response times and increase success rates.(U)
- (U) (\$1,466) NATIONAL BLOOD RESEARCH LABORATORY: To determine the optimum method to produce the maximum amount of growth factors from units of high yield platelets collected by the American Red Cross and determine methods to reduce particulate matter in blood product transfusion

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- (U) (\$5,648) RURAL HEALTH: Identify specific needs and requirements confronting the delivery of healthcare and continuing medical education in remote and medically under-served areas.
- (U) (\$977) COMMUNITY HOSPITAL TELEHEALTH CONSORTIUM: Improve and expand the opportunity for rural and urban underserved populations to receive quality, affordable health care.
- (U) (\$1,173) MINIMALLY INVASIVE SURGICAL TECHNOLOGY INSITUTE: Provide an integrated approach allowing investigators to perform experimental studies which will result in the development of non-invasive monitoring techniques and surgical interventional methods, cell therapy rather than organ replacement, and further examination of approaches to accelerate wound healing.
- (U) (\$1,466) VECTORED VACCINE RESEARCH PROGRAM: Pursue technology to vaccinate people by placing a vectored vaccine on the surface of the skin. Needles are not required to administer the vaccine and the person being vaccinated is not subjected to the pain of needle injection.
- (U) (\$3,420) BIOMEDICAL RESEARCH IMAGING CORE: Expand the current molecular imaging facilities at the City of Hope National Medical Center and the Beckman Research Institute with the addition of a 600 MHz spectrometer and an X-ray crystallographic imaging plate system.
- (U) (\$977) LOW COST RETRACTABLE NEEDLE AND SAFETY SYRINGE: Develop a prototype for testing and application of a hypodermic retractable needle safety syringe for the protection of patients and healthcare workers.
- ((U) (\$3,322) TREATMENT OF RADIATION SICKNESS RESEARCH: Establish a large, racially diverse stem cell umbilical cord blood bank that can be used for the treatment of victims of radiation exposure in an emergency and for the five to ten thousand patients each year who are afflicted with many of the diseases that can be treated by stem cell transplants like leukemias and lymphomas.
- (U) (\$2,541) MEDICAL PROCEDURE REFERENCE TOOL: Develop a Medical Procedures Reference Tool for field use. The Medical Procedures Reference Tool (MPRT) is a computer-based system that will provide refresher and advanced medical training and specialized reference materials to Navy Corpsmen (HM).
- (U) (\$2,199) NATIONAL CENTER FOR COLLABORATION IN MEDICAL MONITORING AND SIMULATION: Integrate the medical resources of Eastern Virginia Medical School with the expertise in modeling and simulation of the Virginia Modeling, Analysis and Simulation Center (VMASC) at Old Dominion University. The Center is adapting military, government, and industrial modeling and simulation technologies for use in medical and surgical training and in the delivery of medical services.

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- (U) (\$977) INSTITUTE OF TECHNOLOGY BIOMEDICAL RESEARCH AND DEVELOPEMNT COMPLEX: Develop a highly integrated portable sensor system for the detection of Chemical and Biological Warfare (CBW) Agents. This device will have the potential to detect spores and aerosols and be capable of detecting a variety of agents ranging from small molecules, to proteins, viruses, and bacteria.

3. (U) FY 2004 PLAN:

- (U) (\$1,133) NONINVASIVE INTERNAL HEMOSTASIS (ULTRASOUND): Initiate studies and testing of a lightweight portable hand held instrument to control and cauterize deep internal hemorrhage by non-invasive ultrasound.
- (U) (\$436) RESUSCITATION FLUIDS: Initiate studies to test and evaluate an improved low volume physiologic fluid that maintains cardiovascular parameters during acute hemorrhage in the presence, or absence of head injury.
- (U) (\$227) USING ESP (ESTIMATING SUPPLIES PROGRAM) TO VALIDATE FLEET MARINE FORCE MEDICAL RESOURCE REQUIREMENTS: Continue field testing of a computer application that provides medical planners with accurate consumable medical supplies to deliver based on type and volume of patient casualty stream.
- (U) (\$1,735) MEDICAL DATA SURVEILLANCE AND NAVAL MEDICAL WATCH BOARD THREAT ALERT INTERFACE: Continue testing of a C4I system that will create geographical displays of medical threat alerts.
- (U) (\$435) SHIPBOARD MEDICAL GRADE WATER: Initiate testing and evaluation of the shipboard medical grade water system water under field conditions. This technology provides continuous quantities of sterile USP grade water for medical use (e.g., reconstitution of lyophilized drugs and blood products) in a forward area.
- (U) (1,627) LONG RANGE RAID CASUALTY EVACUATION, EN ROUTE CARE, OPERATIVE FIELD DENTISTRY: Continue field testing and evaluation of critical care medical and dental equipment to execute current military operations

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B. (U) PROGRAM CHANGE SUMMARY: See Program Change for PE

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

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(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE	TOTAL COMPLETE	TOTAL PROGRAM
M2650 Voice Instructional Devices (VID)	5,821	0		0	0	0	0	0	0	5,821

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 2002 PLAN:

- (U) (\$5,821) VOICE INSTRUCTIONAL DEVICES (VID): Completed the test and evaluation of voice activated technology for ship-board environmental health and clinical medicine practices.

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B. (U) PROGRAM CHANGE SUMMARY: See Program Change for PE

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

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(U) COST: (Dollars in Thousands)

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M2896 Military Dental Research	2,761	2,933	0	0	0	0	0	0	0	5,694

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(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 2002 PLAN:

- (U) (\$2,761) Continued studies to address dental readiness and preparedness issues prior to deployment, as well as continued the further development of salivary tests that determine exposure to infectious diseases and bio-terrorism agents.

2. (U) FY 2003 PLAN:

- U) (\$2,933) DENTAL HEALTH: Support the Military Dental Research Programs of the Naval Institute for Dental and Biomedical Research (NIDBR) and the US Army Dental Research Detachment (USADRD) collocated at the Naval Training Center (NTC), Great Lakes, IL. The primary focus of these Military Dental Research Programs is to examine the dental threat to our operational forces and develop techniques and products to improve dental and medical care for these forces.

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B. (U) PROGRAM CHANGE SUMMARY: See Program Change for PE

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

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M2897 High Resolution Digital Mammography	1,443	0	0	0	0	0	0	0	0	1,443

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop a high resolution digital detector for use in digital mammography and to develop a clinical workstation for display of high resolution image data sets generated by digital images.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 2002 ACCOMPLISHMENTS:

- (U) (1,443) High Resolution Digital Mammography: Completed the development a high resolution digital detector for use in mammography and medical workstations to display the high resolution mammogram images..

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B. (U) PROGRAM CHANGE SUMMARY: See Program Change for PE

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

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M2795 Coastal Cancer Control (MUSC)										
	3,396	4,452	0	0	0	0	0	0	0	7,848

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 2002 PLAN:

- (U) (\$3,469) COASTAL CANCER CONTROL (MUSC): Continue research efforts that will focus on supporting applied cancer research projects that focus on primary and secondary prevention in underserved areas.

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B. (U) PROGRAM CHANGE SUMMARY: See Program Change for PE

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

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