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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 3: Advanced Technology Development (ATD)				R-1 ITEM NOMENCLATURE PE 0603729N: Warfighter Protection Adv Tech							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	52.711	51.893	18.076	0.000	18.076	18.379	24.262	23.234	28.038	Continuing	Continuing
2914: Warfighter Protection Adv Tech	11.024	18.532	18.076	0.000	18.076	18.379	24.262	23.234	28.038	Continuing	Continuing
9999: Congressional Adds	41.687	33.361	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	190.888
A. Mission Description and Budget Item Justification											
<p>The efforts described in this Program Element (PE) are based on investment directions as defined in the Naval S&T Strategic Plan approved by the S&T Corporate Board (Feb 2009). This strategy is based on needs and capabilities from Navy and Marine Corps guidance and input from the Naval Research Enterprise (NRE) stakeholders (including the Naval enterprises, the combatant commands, the Chief of Naval Operations (CNO), and Headquarters Marine Corps). It provides the vision and key objectives for the essential science and technology efforts that will enable the continued supremacy of U.S. Naval forces in the 21st century. The Strategy focuses and aligns Naval S&T with Naval missions and future capability needs that address the complex challenges presented by both rising peer competitors and irregular/asymmetric warfare.</p>											
<p>This program supports the development and demonstration of field medical equipment, diagnostic capabilities and treatments; technologies to improve warfighter safety and to enhance personnel performance under adverse conditions; and systems to prevent occupational injury and disease in hazardous, deployment environments. Navy investment in these areas is essential because Navy/USMC mission needs are not adequately addressed by the civilian sector or other Federal agencies. For example, civilian emergency medicine does not address casualty stabilization during long transit times to definitive care. The National Institutes of Health (NIH) focuses on the basic science of disease processes and not product development. Programs are coordinated with other Services through the Armed Services Biomedical Research Evaluation Management (ASBREM) Committee to prevent duplication of effort. This project funds the Force Health Protection program a Future Naval Capability (FNC) that will provide technology options for future Navy and Marine Corps capabilities and supports the "Sea Warrior" component of the Naval Transformation Roadmap, medical logistics aspects of "Sea Basing" and expeditionary force medical support associated with "Sea Strike".</p>											
<p>Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.</p>											

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APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE			
1319: Research, Development, Test & Evaluation, Navy		PE 0603729N: Warfighter Protection Adv Tech			
BA 3: Advanced Technology Development (ATD)					
B. Program Change Summary (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	53.766	18.609	0.000	0.000	0.000
Current President's Budget	52.711	51.893	18.076	0.000	18.076
Total Adjustments	-1.055	33.284	18.076	0.000	18.076
• Congressional General Reductions		-0.216			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		33.500			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-0.785	0.000			
• SBIR/STTR Transfer	-0.270	0.000			
• Program Adjustments	0.000	0.000	18.076	0.000	18.076
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 9999: Congressional Adds				FY 2009	FY 2010
Congressional Add: Naval Special Warfare Performance and Injury Prevention Program				0.000	1.992
Congressional Add: CW Bill Young Marrow Donor Program				31.415	31.369
Congressional Add: INTEGRATED WARFIGHTER BIODEFENSE PROGRAM				2.992	0.000
Congressional Add: MASSIVE TISSUE INJURY/AMPUTATION REPAIR WITH COMPO				3.191	0.000
Congressional Add: Amelioration of Hearing Loss				0.997	0.000
Congressional Add: High Speed Blood and Fluid Transfusion Equipment				3.092	0.000
Congressional Add Subtotals for Project: 9999				41.687	33.361
Congressional Add Totals for all Projects				41.687	33.361
Change Summary Explanation					
Technical: Not applicable.					

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<p>Schedule: Not applicable.</p> <p>FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.</p>		

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APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603729N: <i>Warfighter Protection Adv Tech</i>				PROJECT 2914: <i>Warfighter Protection Adv Tech</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
2914: <i>Warfighter Protection Adv Tech</i>	11.024	18.532	18.076	0.000	18.076	18.379	24.262	23.234	28.038	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program supports the development and demonstration of field medical equipment, diagnostic capabilities and treatments; technologies to improve warfighter safety and to enhance personnel performance under adverse conditions; and systems to prevent occupational injury and disease in hazardous, deployment environments. Navy investment in these areas is essential because Navy/USMC mission needs are not adequately addressed by the civilian sector or other Federal agencies. For example, civilian emergency medicine does not address casualty stabilization during long transit times to definitive care. The NIH focuses on the basic science of disease processes and not product development. Programs are coordinated with other Services through the Armed Services Biomedical Research Evaluation and Management (ASBREM) Committee to prevent duplication of effort. This project funds the Force Health Protection program a Future Naval Capability (FNC) that will provide technology options for future Navy and Marine Corps capabilities and supports the "Sea Warrior" component of the Naval Transformation Roadmap, medical logistics aspects of "Sea Basing" and expeditionary force medical support associated with "Sea Strike".

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
BONE MARROW RESEARCH	0.000	0.943	0.000	0.000	0.000
<p>The goal of the Bone Marrow program is to test, develop and evaluate military contingency capabilities in order to improve care for casualties of marrow-toxic substances. This program will research efforts to refine and correctly identify matched marrow and matched platelets for casualties as well as military members with medical injuries including combat trauma. FY 2010 initiate and complete the Bone Marrow Research.</p> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Initiate and complete the Bone Marrow Research. 					
CASUALTY CARE AND MANAGEMENT	6.950	5.489	5.287	0.000	5.287

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
The goal of Casualty Care and Management is to maximize the continuum of care with lifesaving interventions as close to the battlespace as possible. This is in an increasingly lethal battlespace, with reduced infrastructure and logistics.						
The decrease in funding from FY 2009 to FY 2010 is due to the completion of the Medical Planning Tools and Repetitive Neurotrauma (RNT). FNC efforts in this area, and the realignment of the Post Traumatic Stress Disorder Mitigation. FNC efforts into the Casualty Prevention activity of this PE.						
FY 2009 Accomplishments: - Continued study to demonstrate selectivity/specificity of biomarkers for mild & moderate RNT in appropriate pre-clinical model. - Continued efforts to develop advanced technologies for First Responders. - Continue efforts to develop advanced technologies to support the Forward Resuscitative Surgical System/ Expeditionary Resuscitative Surgical Systems (FRSS/ERSS). - Continued program to develop advanced technologies to support En Route Care of casualties.- Continued preclinical study to evaluate use of vasopressin to manage traumatic brain injury (TBI). - Continued development of casualty management tools and data. These tools and data are required by combat, material development and medical planners to evaluate the effectiveness of personal protection systems and healthcare support services, and to project future material and training requirements. - Continued clinical trial evaluating safety of vasopressin for treatment of trauma patients. - Continued efforts to develop a novel fibrinogen-like bandage using nanotechnology for hemorrhage control (internal and external). - Continued efforts to develop prototype technology for closed-loop resuscitation for USMC En Route Care system. - Continued program to examine comorbidity of traumatic brain injury. (Continuation of similar effort funded in Healthy and Fit Force activity of this PE prior to FY 2009.) - Completed preclincial study to evaluate use of vasopressin to manage RNT.						

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<div>- Completed development of casualty management tools and data. These tools and data are required by combat, material development and medical planners to evaluate the effectiveness of personal protection systems and healthcare support services, and to project future material and training requirements.</div> <div>- Completed efforts to develop prototype technology for closed-loop resuscitation for USMC En Route Care system.</div> <div>- Completed Breacher study efforts at the Dynamic Entry School/Quantico a component of the FRSS/ERSS.</div> <div>- Completed preclinical study to evaluate use of vasopressin to manage traumatic brain injury (TBI).</div> <div>- Completed remaining project to enhance medical planning tools for combat developers.</div> <div>- Initiated efforts to treat the psychological manifestations' of combat stress.</div> <div>- Initiated pharmacologic research studies to support an FDA Investigational New Drug (IND) application.</div> <div>FY 2010 Plans:</div> <div>- Continue all efforts of FY 2009 less those noted as completed above.</div> <div>- Continue efforts to develop advanced technologies to support Rapid Blood Treatment. (Previously identified as First Responder in FY09 in this activity)</div> <div>- Continue efforts to develop advanced technologies to support Advanced Forward Care. (Previously identified as FRSS/ERSS in FY09 in this activity)</div> <div>- Continue efforts to develop advanced technologies to support Warfighter Restoration. (Previously identified as En Route Care in FY09 in this activity)</div> <div>FY 2011 Base Plans:</div> <div>- Continue all efforts of FY 2010 less those noted as completed above.</div> <div>- Initiate development of multifunctional blood substitute program.</div>					
CASUALTY PREVENTION	4.074	5.947	7.186	0.000	7.186

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Casualty Prevention includes protecting the warfighter from environmental, occupational and battlefield threats.						
The increase in funding from FY 2009 to FY 2011 is due to the initiation of emerging technologies that support delivery of approved FNC enabling capabilities and to increased investments for Post Traumatic Stress Disorder Treatment FNC efforts in this activity.						
FY 2009 Accomplishments: <ul style="list-style-type: none">- Continued efforts to mitigate the effects of environmental and other threats to health.- Continued efforts to reduce operational injuries.- Continued research to determine the safety and efficacy of perfluorocarbons in treating decompression sickness and arterial gas embolism. (Realigned from Healthy and Fit Force activity of this PE after 2008.)- Completed safety studies and analysis of compartmental shipboard heat exposure levels.- Completed head-neck blast effects computational representation and experimental surrogate; operational injury.- Initiated development of tools to prevent psychological stress and PTSD. (Continuation of similar effort funded in Healthy and Fit Force activity of this PE prior to FY 2009.)						
FY 2010 Plans: <ul style="list-style-type: none">- Continue all efforts of FY 2009.- Continue efforts to model head and neck injuries due to accelerated forces; operational injuries.- Initiate research to enhance force readiness by mitigating the impact of environmental stressors.- Initiate development of Human Injury and Treatment (HIT) model to assess personnel survivability, optimal personnel treatment, and restoration of ship operational capabilities.						
FY 2011 Base Plans: <ul style="list-style-type: none">- Continue all efforts of FY 2010, less those noted as completed above.						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- Complete research to determine the safety and efficacy of perfluorocarbons in treating decompression sickness and arterial gas embolism.						
NAVAL NOISE-INDUCED HEARING LOSS (NIHL) The goal of this program is to reduce the incidence of NIHL by nearly 100%. This program employs a total systems engineering approach that includes advancements in medical technology, jet engine physics, personal protective equipments, and mitigation analyses. Similar/related research was previously funded within this PE. This is a new effort in FY 2010 in support of applied research efforts. FY 2010 Plans: - Initiate advanced research in medical prevention and treatment of NIHL and tinnitus (ringing in the ears). - Initiate advanced research to reduce noise at the source, i.e. jet engine quieting and flight deck noise reduction. - Initiate advanced research to improve personal protective equipment technology. - Initiate advanced research to study the incidence and susceptibility of NIHL and tinnitus, and to evaluate mitigation strategies. FY 2011 Base Plans: - Continue all efforts of FY 2010.		0.000	6.153	5.603	0.000	5.603
Accomplishments/Planned Programs Subtotals		11.024	18.532	18.076	0.000	18.076

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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• 0602236N: WARFIGHTER PROTECTION WARFIGHTER SUSTAINMENT APPLIED RESEARCH	3.770	5.059	6.220	0.000	6.220	5.996	4.447	2.268	0.565	0.000	28.325
D. Acquisition Strategy N/A											
E. Performance Metrics Efforts within this PE are measured at two levels. At the lower level, each is measured against technical and financial milestones on a monthly basis. Annually, each project is reviewed in depth for technical and transition performance by the Chief of Naval Research (CNR).											

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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: Congressional Adds	41.687	33.361	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	190.888
A. Mission Description and Budget Item Justification Congressional Interest Items not included in other Projects.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010			
Congressional Add: Naval Special Warfare Performance and Injury Prevention Program FY 2010 Plans: This effort supports Navy Special Warfare Performance and Injury Prevention Program for Special Boat Team 22 research.							0.000	1.992			
Congressional Add: CW Bill Young Marrow Donor Program FY 2009 Accomplishments: This effort supported the C. W. (Bill) Young Bone Marrow registry program. FY 2010 Plans: Continues support of the C.W. Bill Young Bone Marrow Donor Recruitment and Research Program research.							31.415	31.369			
Congressional Add: INTEGRATED WARFIGHTER BIODEFENSE PROGRAM							2.992	0.000			

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B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
<i>FY 2009 Accomplishments:</i> This research supported the development of a framework for integrating health databases, sensor inputs, and distributed artificial intelligence, in order to detect and characterize likely threats, plan for logistical burden, and present viable plans for action in an intuitive framework that can be used by military planners with minimal instruction.		
Congressional Add: MASSIVE TISSUE INJURY/AMPUTATION REPAIR WITH COMPO <i>FY 2009 Accomplishments:</i> This effort supported the development of advanced techniques for transplanting composite tissue (skin/tendon/bone) and organs (heart, kidney) with minimal or no immunosuppression. Research directly applies to the clinical care of military casualties with traumatic injuries.	3.191	0.000
Congressional Add: Amelioration of Hearing Loss <i>FY 2009 Accomplishments:</i> This effort supported the amelioration of hearing loss program which serves to develop a treatment(s) to reverse noise-induced hearing loss by regenerating functional sensory cells in the cochlea. Research has attempted to: 1) Validate a working model of induced hair cell regeneration in the cochlea in a preclinical setting. 2) Examine the ability to use gene expression technology to re-grow functional cochlear hair cells in the guinea pig to restore hearing. 3) Transition animal data to begin the process for FDA approval. Note: Program utilizes animal models only and will not involve human testing.	0.997	0.000
Congressional Add: High Speed Blood and Fluid Transfusion Equipment	3.092	0.000

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B. Accomplishments/Planned Program (\$ in Millions)			
		FY 2009	FY 2010
<i>FY 2009 Accomplishments:</i> This effort supported the development and demonstration of a new temperature-conditioning blood and fluids technology for infusion/transfusion that can be operated without electrical power, but instead uses high power density thermal energy storage technology.			
Congressional Adds Subtotals		41.687	33.361
C. Other Program Funding Summary (\$ in Millions)			
N/A			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
Congressional Interest Items not included in other Projects.			

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