

Military Unique Settings

(e.g. physical training, tactical exercises)

Current Practices and Initiatives In Injury Prevention

Development and Validation of a Physical Performance Prediction Model

Office of Naval Research & Old Dominion University

Effects of Training on Physical Performance Wearing Personal Protective Equipment

Naval Hospital Portsmouth:

Exercise Regimen Aimed to Prevent Musculoskeletal Injuries

Navy Operational Sport Center Green Bay

Functional Movement Screen: A novel Tool for Injury Risk Stratification of Warfighters

USU Consortium for Health and Military Performance

Naval Special Warfare Development Group: Individual Augmentee Training Guide, Naval Special Warfare Development Group

Navy Operational Fitness & Fueling System (NOFFS): Development & Execution & Delivery

Center for Personal and Professional Development - Development
Commander Naval Installations Command (CNIC) – Execution and Delivery

Performance and Resiliency (PERRES) Initiative

SOCOM

Physical Training Related Injury Prevention

Military Training Task Force joint Services Physical Training Injury Prevention Work Group:

POSE Running Technique program, Recruit Training Command Great Lakes

Senior Health Assessment Program Enterprise (SHAPE)

Commander Naval Installations Command (CNIC)

SMART Body Composition Program SOP

Marine Corps Bases Okinawa & Camp Smedley D. Butler:

Waterfront Fitness Program

Commander Naval Installations Command (CNIC)

The Effects of Personal Protective Equipment on Functional Performance NMCP2008.0067,

Office of Naval Research

Development and Validation of a Physical Performance Prediction Model, NMCP2008.0023

OFFICE OF NAVAL RESEARCH & OLD DOMINION UNIVERISTY
Arlington, VA & Norfolk, VA

Purpose: Compare two training regimens to determine which is the most effective.

Background: A comparative study was done to examine two training regimens in order to determine which was the most effective. This was done in order to evaluate specific tasks and jobs, recommended exercises to improve performance and to model injury history and tasks within jobs to optimize the individual's performance. The study looked to analyze which program had greater performance improvement, fewer injuries, determine which activities were associated with the most injuries and identify relationships between tests and performance.

Discussion: The study examined Cross-Fit which is a high intensity, anaerobic training regimen and Sequential Performance Enhancement and Readiness Exercise Development (SPEARED) which is a sequential approach for training to increase performance and decrease risk of injury.

The study lasted for 8 weeks and data including injury tracking, Cardiovascular (CV), body fat, balance and functional tests as well as training and injury logs were administered and collected.

CV testing included:

- Inclined treadmill
- 35lb pack
- Aerobic capacity, VO2MAX
- Ventilatory threshold, lactate clearance and sustainable aerobic capacity

Balance (Postural Control) testing included:

- Star excursion balance test
- Balance error scoring system
- Functional movement screen
- Neurocom sensory organization test (Gold Standard postural control testing)

Muscle Function:

- Lower Extremity Strength (Hip flexion/extension, adduction/abduction, internal/external rotation, knee flexion/extension)
- Upper Extremity Work

Functional Testing:

- 300 yard Shuttle Run
- Box drill
- Wall Jump
- Rope pull/Dummy Carry
- Margaria-Kalamen Step
- 50m swim with 50lb ruck
- 24ft caving ladder climb

Recommendation: No recommendation provided.

Contact Information

Arlington, VA/Norfolk, VA
Office of Naval Research & Old Dominion University

Effects of Training on Physical Performance Wearing Personal Protective Equipment

NAVAL HOSPITAL PORTSMOUTH
Portsmouth, VA

Purpose: The study evaluated the effects of wearing a weighted-vest during 6 weeks of military-style training.

Background: Fitness is essential to the day-to-day effectiveness and combat readiness of the Marine Corps. The Marine Corps considers physical fitness an indispensable aspect of leadership. The habits of self-discipline required to gain and maintain a high level of physical fitness are inherent to the Marine Corps way of life and must be a part of the character of every Marine. Marines who are not physically fit can be a detriment to the readiness and combat efficiency of their unit. Accordingly, every Marine will engage in an effective PCP on a continuing and progressive basis.

The Marine Corps PCP has two main components - The Physical Fitness Test and the Body Composition Program. The PFT is a semi-annual evaluation.

The PFT has three events, pull-ups (Flexed-Arm Hang for females), abdominal crunches, and a 3-mile run. All PFT events will be conducted in a single session, not to exceed 2 hours in duration. Movement of Marines from one event to the next should allow adequate time to recover, stretch, and drink water.

Discussion: Thirty-seven participants were randomly assigned to a control group or a vest group (carrying 4-5 kg for 2 weeks, and 8-10 kg for 4 weeks). Both groups performed stair climbing, calisthenics, etc. for one hour, four times per week. Pre- and post-tests were performed while wearing military personal protective equipment, with the exception of the Marine Physical Readiness Test (PRT).

Both groups significantly improved uphill treadmill performance, maximal oxygen consumption (VO₂MAX), PRT scores and an agility drill. The vest group improved treadmill time and VO₂MAX approximately twice as much as the control group, although these differences did not reach significance ($p= 0.16$ and 0.13 , respectively). The study concluded that training with a weighted-vest is a successful means of conditioning.

Recommendation: Further extensive research should be done using a longer training period with more weight. Injuries from wearing a weighted-vest during such training data should be collected.

Contact Information

Naval Hospital Portsmouth
Portsmouth, VA

Exercise Regimen Aimed to Prevent Musculoskeletal Injuries

NAVY OPERATIONAL SUPPORT CENTER
Green Bay, WI

Purpose: To prevent Musculoskeletal injuries.

Background: To prevent musculoskeletal injuries, the Command Fitness Leader, ACFL, Safety Officer, and Medical Corpsman, has established a workout plan that is efficient, meets core training goals, and is monitored throughout the fitness evolution to ensure no injuries are happening from improper form while working out.

Discussion: The population size of the Navy Operational Support Center, Green Bay is 185 with a ratio of 75/25 percent male/female. The average rank is an E-5 and all occupation/rates are encompassed.

Green Bay baseline measurements defining the types and impact of annual injuries on your command

a. Annual number of musculoskeletal injuries.

Total	
(1). Tactical/Training related:	5
(2). Occupational (ex back pain, carpal tunnel)	10
(3). Sports/Recreation related	2

b. Annual impact of musculoskeletal injuries:

1. Annual light duty days (member stayed within the command):	2
2. Annual limited duty days (member moved to another command):	30
3. Annual lost work days	30
4. Annual Outpatient Visits	20
5. Annual Surgical Procedures	5
6. Annual Hospitalizations	3
7. Annual Medical Separations:	1
8. Annual Deaths:	0

OUTCOMES

Please identify the most recent annual musculoskeletal injury related data following the institution of your program:	
1. Number of months program was in existence when data was collected:	6
2. Target Population Size	185
3. Outcomes Data:	
a. Annual number of injuries	1
b. Annual light duty days	2
c. Annual limited duty days:	20
d. Annual lost work days:	10
e. Annual Outpatient Visits	5
f. Annual Surgical Procedures	1
g. Annual Hospitalizations	1
h. Annual Medical Separations:	0
i. Annual Deaths:	0

PROGRAM RESOURCE REQUIREMENTS

1. Please identify the start-up (one time) expenditures required to implement your program.

a. Facility:

Description	Cost
Proper Equipment	On Hand \$0
Safety Officer Review	\$0
Medical Officer Review	\$0
CFL Implementation	\$0
TOTAL:	\$0

b. Equipment:

Item	Units	Unit Cost	Total
Dumb Bells	25	On Hand	
Balance Balls	25	On Hand	
Mats	25	On Hand	
Elliptical	15	On Hand	
Bike	15	On Hand	
Treadmill	15	On Hand	

Manpower

Military

Position	Rank	FTE	\$/FTE	Total
Command Fitness Leader	E6			
Assistant CFL	E6			
Safety Officer	E6			
Medical Corpsman	E5			
TOTAL:	4			

Recommendation: Sample Exercise Regimen for program was requested but never received. No recommendation provided.

Contact Information

CFL / DC1 / E6

Navy Operational Support Center, Green Bay

Functional Movement Screening: A novel Tool for Injury Risk Stratification of Warfighters

USU CONSORTIUM FOR HEALTH AND MILITARY PERFORMANCE
Bethesda, Maryland

Purpose: The purpose of the study was to assess the feasibility of screening a large military population and identify whether Functional Movement Screening (FMS) scores predicted injury.

Background: Musculoskeletal injuries are common in military basic training and can result in significant morbidity and losses to the force. The FMS is designed to evaluate functional human movements for identifying and proactively addressing functional limitations and theoretically decrease risk of future injury. The FMS consists of 7 movements, with each receiving a score of 0-3 points, to yield a maximal score of 21 points. The screen tests posture, range of motion, muscle performance, motor control, balance, and pain-free movement. Prior research on athletes has shown increased injury risk with scores ≤ 14 . The system has been used by many professional athletic teams, but never studied prospectively in a systematic way without intervention.

Discussion: This study evaluated a large military population, 934 volunteer participants from Officer Candidate School (OCS), and correlated FMS score with injury during training.

The research was a prospective observational study administered at OCS, Marine Corps Base Quantico which utilized a cohort design. Volunteers had a baseline FMS during in-processing and medical records were tracked for injury during OCS. Graduation Rates due to injury were also compared with initial FMS scores. The main outcome measure was the initial FMS scores versus subsequent injury data which were analyzed and attrition rate due to injury was compared with initial FMS score.

Statistically, FMS scores were loaded in EXCEL 2003 and simple descriptive statistics were analyzed using SPSS v16.0. Chi-square analysis was performed to evaluate the risk ratio of having a score ≤ 14 and attrition for injury as well as FMS score ≥ 15 and attrition for injury.

The study resulted in a mean FMS score of 16.7 ± 1.8 with a range of 6 to 21. Only 14% had scores ≥ 19 and 0.2% had scores ≤ 10 . The most frequent score was a 17, with 23% of all volunteers being assigned that score. Attrition for injury in those who has scores ≤ 14 was 14.9% vs. 7.1% for those who had scores ≥ 15 . The risk ratio (attrition/graduated) = 2.08, 95% CI=1.14-3.82, $p < 0.02$.

The study concluded that FMS can be conducted on a large cohort of military personnel to yield a wide range of scores. Only 10% of participants had a score ≤ 14 , and these candidates were twice as likely to not graduate due to injury as those with higher scores.

Recommendation: No recommendation provided.

Contact Information

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USU Consortium for Health and Military Performance

Individual Augmentee Training Guide

NAVAL SPECIAL WARFARE DEVELOPMENT GROUP, OPNAV 135
Washington, D.C

Purpose: To advance the Navy's Physical Readiness Program to reflect the current operational and physical demands of the everyday Sailor.

Background: During September 2007, OPNAV 135 Physical Readiness Program sent their Physical Therapist and Certified Strength and Conditioning Specialist to Fort Jackson, South Carolina to provide feedback on the physical condition of Sailors preparing to deploy on IA assignments. This initiative was spearheaded by the recommendations of Naval Audit Service to advance the Navy's Physical Readiness Program to reflect the current operational and physical demands of the everyday Sailor.

Discussion: During the data collection, OPNAV N135 Physical Readiness Program identified the most common musculoskeletal overuse injuries. They also documented any movement pattern or operational training requirement the Sailors had difficulty performing during the two week training period. During the next year, the Physical Readiness Program developed a 63 page combat training and injury prevention guide. This resource tool was posted on the NPC website for CFLs to use and disseminate to individuals within their command who was preparing for an IA assignment (<http://www.persnet.navy.mil/CommandSupport/PhysicalReadiness/>). During 2008-2009, the Physical Readiness Program also provided 3 hours of hands-on instruction for combat training within the gym during their annual CFL continuing education seminars. During these sessions, CFLs used 8 lb body bars to simulate weapon carry, and performed movement patterns that would mimic operational evolutions such as house clearing, convoy ops, urban ops, reflexive fire and ground maneuvering. Within the past two years, over 500 CFLs received hands on training on how to implement the Individual Augmentee Training guide within their command.

Recommendation: No recommendation provided.

Contact Information

Physical Therapist-Sports Medicine
Naval Special Warfare Development Group

NAVY OPERATIONAL FITNESS & FUELING SERIES



Improving the Operational Performance of Sailors

LIFT – PUSH – PULL – CARRY

Movement Preparation, Multidirectional Movement Training,
Strength Training, Cardiovascular Training, Recovery Training
& Nutritional Fueling Strategies

Navy Operational Fitness and Fueling Series (NOFFS)

Purpose: The Navy Operational Fitness and Fueling Series (NOFFS) is designed to provide the Navy with a “world class” performance training resource for fleet Sailors as well as Navy health and fitness professionals. Using the latest sports science methodologies, the logic engine for NOFFS combines both human performance and injury prevention strategies, resulting in safer training while yielding positive human performance outcomes. The exercises used in the NOFFS product are designed to replicate the activities Sailors conduct in their operational duties: lifting, pushing, pulling, and carrying. Developed as a complete fitness package, the Fueling aspect of this resource provides Sailors the tools required to make healthy nutrition choices in both shore-based and operational environments.

Background: In 2009, Navy Subject Matter Experts (SMEs) began reviewing the existing exercise programs to determine how to best improve performance and reduce training injuries among Sailors. Utilizing input from over 750 Sailors, feedback was collected through focus groups, personal interviews, and surveys from operational Sailors, Command Fitness Leaders (CFLs), and health, fitness, and nutrition professionals. Data showed a clear demand signal for a product that would “eliminate the guesswork” in developing workout programs for Sailors – a complete “balanced” and evidence-based workout combined into one training program. Feedback also indicated the desire for a resource that is easy for Sailors to use while being durable enough to function on operational platforms with typical space and equipment limitations.

Throughout the development phase, Navy Subject Matter Experts worked closely with Athletes' Performance Institute (API) in all aspects of program design. API is recognized as an industry leader in human performance training. Many professional athletes and sports franchises around the world integrate Athletes' Performance Training Systems into their fitness programs to enhance their performance, while reducing their injury potential. This partnership has been leveraged to provide the Navy the same functionality and caliber of program design used by professional athletes from all over the world.

Utilization: The NOFFS contains four specialized series tailored for use on submarines, surface ships, large decks, and for group physical training. Designed specifically for real-world space and equipment limitations, these four categories provide Sailors three different levels of exercises that are based on current fitness and capability. While the NOFFS exercises are designed and illustrated to be used without supervision or direction, this resource is being incorporated into Command Fitness Leader training, and users should request assistance when needed.

Summary: Sailor resiliency and durability are the primary goals of NOFFS. Sailors are encouraged to utilize these resources to develop and maintain their operational readiness and overall fitness both on and off duty.

NOFFS Partnership

Succeeding in the military requires many of the same characteristics it takes to compete at the highest level of sport—the mindset of a champion, sustained dedication, effective nutrition, exceptional movement quality, and active recovery to reduce injury risk and improve performance. The parallels between the demanding military environment and the tasks of the professional athlete are what drive the collaborative partnership between the United States Navy and Athletes' Performance Institute (API). It is this shared interest and dedication to human performance initiatives that have resulted in the Navy Operational Fitness and Fueling Series (NOFFS).

Athletes' Performance provides integrated performance training to elite and professional athletes representing all major sports in the United States. The API staff includes members across 4 domestic facilities, as well as full-time personnel in England and Germany, with expertise in a variety of disciplines including; Performance Specialists, Physical Therapists, Athletic Trainers, Registered Dietitians, Education and Research Specialists, Soft Tissue Therapists, and Culinary Arts Specialists. The breadth and depth of staff expertise, in conjunction with the world class training facilities, allows Athletes' Performance to leverage all available resources to deliver a fully integrated system of training and support.

The Athletes' Performance Training System (APTS) is an integrated model incorporating targeted injury reduction strategies, injury rehabilitation, pillar strength, flexibility/mobility, strength & power development, movement skills (speed), energy system development (cardiovascular fitness), regeneration, and nutrition. All of the above components are systematically programmed into training prescriptions designed to enhance an individual's or group's performance. Through this integrated approach, Athletes' Performance is able to help individuals achieve peak performance while simultaneously reducing injury potential.

Athletes' Performance is continually researching and investigating new methods and techniques to stay at the forefront of innovation in the industry. Specific areas of research and collaboration with outside groups interfacing with Athletes' Performance Methodology include:

- Participation in research studies examining API's Training Systems with Arizona State University's Biodesign Department as well as the University of Waterloo.
- A long standing alliance with Baptist Healthcare and the Andrews Institute ensuring that Athletes' Performance is able to provide world class medical support for its clients, ensuring a complete and unmatched continuum of care.
- Partnership with Intel with engagements designed to bring technology to the field of Human Performance.
- Service on Adidas' Innovation Team's Research Advisory Board and active involvement in identifying and executing apparel, footwear, and technology innovations.

Athletes' Performance's pursuit of innovation with regard to the APTS and its collaboration with an extensive network of industry experts, as well as a growing technology and digital media department, drives the continual evolution and delivery of its methodology. Athlete's Performance has been the key collaborative partner with the U. S. Navy in the development of the NOFFS product.

NOFFS Project Development Team

The following organizations participated in the baseline assessment and/or the curriculum development of the Navy Operational Fitness and Fueling Series (NOFFS). Over 750 Sailors participated in the development of NOFFS.

- Athletes' Performance Institute, Gulf Breeze, FL and Phoenix, AZ
- Bureau of Medicine and Surgery (M35CC/PH), Washington, DC
- Center for Personal and Professional Development (Manager, NOFFS Project Development), Virginia Beach, VA
- Commander Naval Installations Command (CNIC), Fitness, Sports and Deployed Forces – Fleet Readiness (N921), Washington, DC
- Navy and Marine Corps Public Health Center (NMCPHC), (Manager, NOFFS Project Development), Portsmouth, VA
- Naval Air Station Lemoore, Lemoore, CA
- Navy Supply Command (NAVSUP), Mechanicsburg, PA
- OPNAV 135 – Physical Readiness Division, Millington, TN and Washington, DC
- 2nd Fleet – Norfolk, VA
 - USS GEORGE HW BUSH (CVN-77)
 - USS BOISE (SSN-764)
 - USS MONTEREY (CG-61)
 - Strike Fighter Squadron ELEVEN - VFA-11 “Red Rippers”
- 3rd Fleet – San Diego, CA
 - USS BENEFOLD (DDG-65)
 - USS BUNKERHILL (CG-52)
 - USS JOHN PAUL JONES (DDG-53)
 - USS PINCKNEY (DDG-91)
 - USS PRINCETON (CG-59)
- 6th Fleet – Naples, IT
 - USS DEVASTATOR (MCM-6)



NOFFS Subject Matter Expert Review Team

Over 60 review packages were released Navy-wide during the project development review phase of the Navy Operational Fitness and Fueling Series (NOFFS). Representation from the following organizations provided SME review comments to the NOFFS project development team.

- Athletes' Performance Institute (API), Gulf Breeze, FL and Phoenix, AZ
- Bureau of Medicine and Surgery (BUMED), Washington DC
 - o BUMED Clinical Care and Public Health (M3/5CCPH)
 - o Navy Musculoskeletal Continuum of Care Advisory Board (MCCAB) Members
 - o Navy and Marine Corps Public Health Center (NMCPHC)
 - o Naval Medical Center – Dietetics Program, Portsmouth, VA
 - o Naval Medical Center – Health Promotion & Command Fitness Program, San Diego, CA
 - o U.S. Naval Hospital – Dietetics Program, Okinawa, Japan
- Commander Navy Installations Command (CNIC)
 - o Civilian Afloat Fitness Program, Millington, TN and San Diego, CA
 - o Fitness, Sports and Deployed Forces – Fleet Readiness (N921), Washington, DC
 - o MWR Deployed Forces, Waterfront Fitness, Mid-Atlantic Region, Norfolk, VA
 - o MWR Fitness, Naval Station Great Lakes, IL
 - o MWR Fitness, Mayport, FL
 - o Navy Region Southwest Fitness, San Diego, CA
- Commander Naval Air Forces (COMNAVAIRFOR) – Headquarters Review, Norfolk, VA
- Expeditionary Combat Readiness Center, Virginia Beach, VA
- Naval Safety Center – Physical Training Injury Prevention, Norfolk, VA
- Naval Education and Training Command – Headquarters Review, Pensacola, FL
 - o Center for Personal and Professional Development, Virginia Beach, VA
 - Command Leadership School (CO, XO, & CMC Schools), Newport, RI
- Naval Service Training Command, Great Lakes, FL
 - Recruit Training Command, Great Lakes, IL
- Navy Supply Systems Command (NAVSUP) Nutrition Program, Mechanicsburg, PA
- Navy Total Force (NTF), Washington, DC
- OPNAV 135 – Physical Readiness Division (OPNAV 135), Millington, TN and Washington DC
 - o Policy and Research Division
 - o Command Fitness Leader Division
- USS GEORGE HW BUSH (CVN-77)
- U.S. Third Fleet (COMTHIRDFLEET) – Headquarters, San Diego, CA
- U.S. Fleet Forces Command, Norfolk, VA

Operational Performance Training

The exercises used in the NOFFS product are designed to prepare Sailors for the demands of their operational duties: lifting, pushing, pulling, and carrying. NOFFS includes specific training in the following areas: pillar preparation, movement preparation, multidirectional movement training, strength training, cardiovascular training, and recovery training. Sailor resiliency and Durability is a primary goal of the development and distribution of the Navy Operational Fitness and Fueling Series.

Operational Performance



NOFFS Exercise



Bent Over Row with Dumbbells



Lateral Squat Low Alternating



Squat with Mini Bands



90/90 Stretch



Romanian Deadlift with Dumbbells

NAVY OPERATIONAL FITNESS AND FUELING SERIES (NOFFS)

Commander Naval Installations Command (CNIC)
Washington, D.C.

Purpose: Purpose is to provide information on the execution and delivery the Navy Operational Fitness and Fueling Series.

Background: NOFFS was designed to provide the Sailor with a "best in class" performance training resource that will provide guidance to Sailors and Navy health and fitness professionals. NOFFS will guide Sailors on how to train effectively and safely while making healthy nutrition choices in both shore-based and operational environments. Sailor resiliency and durability is a primary goal of the development and delivery of the Navy Operational Fitness and Fueling Series. The program was designed with the Sailors' operational platform in mind with a varying level of difficulties and equipment options to provide a progressive personal physical fitness training program. CNIC fitness professionals from across the enterprise were trained by Athletes' Performance Institute with an end goal of providing institution wide program experts as a resource to CFL's, ACFL's and individual Sailors in the implementation of NOFFS.

Discussion: Train-the-Trainer Courses were delivered at 5 locations across the enterprise, producing 108 NOFFS certified instructors.

- CFA Yokosuka, Japan
- NB San Diego, CA
- NAS Oceana, VA
- NAS Pensacola, FL
- NSA Naples, Italy

Instructors have begun training CFLs and individual Sailors in the use of NOFFS. The short course curriculum consists of NOFFS methodology, navigating the card sets and a practical component of performing and coaching the movements.

The primary development goals of NOFFS are injury prevention and Sailor resiliency. The ability to have a NOFFS certified fitness professional across the enterprise will allow for a personal approach to assist Sailors in refining movement patterns and provide individualized guidance to coach Sailors in the proper application of the exercise program.

A variety of tools will be made available to the Sailor. Each ship will be provided a number of fit kits and card sets that will be available for checkout. Installation fitness centers will be provided with a group training kit, a number of fit kits and card sets available for checkout. In addition to the physical training tools, a Navy Fitness webpage is being completed that will host an electronic application for downloading the card sets at any location. This electronic application will also allow individuals to download NOFFS to their iTouch and iPhone.

The Defense Media Agency has assisted by filming and composing articles that have aired on AFN, online Daily News Updates and printed in sources such as All Hands Magazine. An initial program research meeting has been conducted to coordinate the efforts of many teams to analyze the effectiveness of NOFFS.

Recommendation: Continue to develop curriculum and implement program based on feedback from field SMEs and future research study outcomes.

Contact Information

Commander Naval Installations Command (CNIC)
Washington, D.C.

Performance and Resiliency (PERRES) Initiative

SOCOM

MacDill Air Force Base, Florida

Purpose: Ongoing development of the \$1.7M/year SOCOM-directed “Warrior Rehabilitation and Performance Center” (WRPC) initiative continues at the US Marine Forces Special Operations Command (MARSOC).

Background: The population size for this initiative is 2,500, 90/10 percent ratio for male/female with an average rank of SSGT. Occupation/rates included USMC special operations teams, support group, schoolhouse and headquarters company. The command/groups that have helped to implement this initiative included line commands, physical therapy, athletic trainer, strength coach and nutritionist. Projected objective outcome measures include faster access to rehab services, decreased injury rate and recovery time, and improved athletic capacity, physical readiness, and body composition measures.

Discussion: WRPC has been renamed the “Performance and Resiliency” (PERRES) initiative. Since 2008, over 35,000 sq ft of rehabilitation and human performance facilities has been designed and either in existence or under construction. Over \$2M worth of world-class rehabilitation and human performance equipment has been procured for both in-garrison and down-range use, under the direction of two active duty physical therapists who also have their “Certified Strength and Conditioning Specialist” (CSCS)-NSCA credential. These were the first two physical therapist billets to be organically attached to USMC units. Once additional manning is brought on board within the next year, the program will be fully operational, designed to provide immediate post-injury rehabilitation, pre-injury screening and subsequent rehabilitation services, and comprehensive strength, nutrition, and conditioning programming to every Marine Special Operations Team, comparable to the daily services available to professional athletes.

Recommendation: Based on what has been accomplished within the past two years at MARSOC, integration of active duty physical therapist billets into regular USMC Infantry Forces is highly recommended to manage post-injury rehabilitation, injury prevention, and strength and conditioning programming efforts.

Contact Information

Physical Therapist

MARSOC, Camp Lejeune and Camp Pendleton

SOCOM

Physical Training Related Injury Prevention

MILITARY TRAINING TASK FORCE JOINT SERVICES PHYSICAL TRAINING INJURY PREVENTION WORK GROUP

Purpose: Recommendations for Prevention of Physical Training (PT)-Related Injuries: Results of a Systematic Evidence-Based Review by the Joint Services Physical Training Injury Prevention Work Group (JSPTIPWG).

Background: The Military Training Task Force (MTTF) of the Defense Safety Oversight Council chartered a Joint Services Physical Training Injury Prevention Work Group (JSPTIPWG) to 1) establish the evidence base for making recommendations to prevent injuries, 2) prioritize the recommendations for prevention programs and policies, and 3) substantiate the need for further research and evaluation on interventions and programs likely to reduce PT-related injuries.

Discussion: Of the 40 PT-related injury prevention strategies reviewed in the scientific literature, 3 were determined to be essential elements of a successful injury prevention program and not interventions in and of themselves. As a result of the work group process, one more essential element was added for a total of four. The remaining 37 interventions were categorized into 3 levels representing the strength of recommendation: recommended, not recommended, and insufficient evidence to recommend or not recommend. Six interventions had strong enough evidence to become JSPTIPWG recommendations for implementation in all four military Services immediately (see below). Two interventions were not recommended due to evidence of ineffectiveness or harm and should be discouraged by leaders at all levels. This technical report identifies 29 injury prevention strategies that have yet to be evaluated (n=6) or that lack sufficient scientific evidence (n=23) to support Quad-Service recommendations at this time. Injury researchers interested in studying the prevention of PT-related injuries in the military should start with this list. The systematic process of evaluating interventions enabled the JSPTIPWG to build Quad-Service consensus around those injury prevention strategies that had enough scientific evidence to support a recommendation.

The study also describes four essential program elements: injury prevention education; leadership enforcement; surveillance; and research and program evaluation

This study lists and provides the rationale for six recommendations:

- Prevent overtraining by de-emphasizing distance running during physical training.
- Increase exercises to improve body movement skills during physical training.
- Provide mouth guards for all individuals participating in high-risk activities
- Make semi-rigid ankle braces available for use by individuals at high risk for re-injury (i.e. those with history of previous ankle sprains) and for others during high-risk activities).
- Provide nutritional supplementation (protein/carbohydrate snack and electrolyte fluids) within one hour after strenuous, prolonged, continuous physical activity of greater than one hour.
- Wear Synthetic Blend Socks to Prevent Blisters

Recommendation: Further scientific investigation, review, and group consensus of 23 popular physical training-related injury prevention strategies needs to be done before they can be recommended to the military services or similar civilian populations.

URL for Study

<http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA484873>

POSE Running Technique program

RECRUIT TRAINING COMMAND

Great Lakes, IL

Purpose: POSE Run Technique Programs were implemented to reduce injuries among recruits and decrease training and recovery time.

Background: The Great Lakes Recruit Training Center instituted a POSE Running Technique program, in to Recruit Convalescent Unit (RCU) phases 2-4. The recruit population size annually is 35,000 with a staff of 1,200. The average rank for recruit population is SR and staff population E-5-O-6 with a variety of occupation/rates. Command/groups who participated in the implementation of the program included line commands, primary care (clinical prevention), physical therapy and athletic trainer.

The POSE running technique is a clear contrast to the heel strike that most runners deploy. The POSE technique unique characteristic is that the runner lands on the midfoot, with the supporting joints flexed at impact, and then uses the hamstring muscles to withdraw the foot from the ground, relying on gravity to propel the runner forward. This program is rooted in the idea that a runner maintains a single pose or position moving continually forward in this position.

Discussion: Program for phases 2 and 3 is focused on strength development specific to running. Side benefit of strength training is that it also carries over in to strength conditioning for push-up and sit-up PFA events. No specific facility was required; just enough space to conduct drills was needed. Equipment cost included instruction booklets for incoming recruits cost ranging from \$6-12 dollars with a varying total cost depending on units and total needed. Other cost included one POSE certified instructor Level 1 (\$1,200) and multiple certified POSE certified instructors (\$450-750, varies on number), multiple certified personnel was recommended. Manpower utilized for the program included the POSE certified instructors rank E-5 and E-6.

POSE Run Technique has been proven to reduce injuries among runners. Currently 85% of all runners, experience an injury on an annual basis. This is an increase from 65% since the 1970's, since the injury rate was first tracked. Numerous studies since 1988 have shown running shoes to actually increase run related injuries. With the extremely high rate of injury rate among runners, many recruits who have never run prior to arriving at Recruit Training Command, fail the PFA run event and or sustain an injury. This increases the length of stay at Recruit Training Command, and raises training costs.

The Recruit Training Center is currently re-developing run clinic for non-injured recruits, to conduct POSE Run Technique training. Open schedule run clinics have been implemented for staff at RTC Great Lakes.

Recommendation: No recommendation provided.

Contact Information

LPO/CFL /FC1/E-6

Recruit Training Command, Great Lakes, IL

SENIOR HEALTH ASSESSMENT PROGRAM ENTERPRISE (SHAPE)

Commander Naval Installations Command (CNIC)
Washington, D.C.

Purpose: Purpose is to provide information on the Senior Health Assessment Program Enterprise (SHAPE) in preparation for response to participant feedback.

Background: Obesity is trending upward in the Military population and the Navy is faced with the greatest challenge of all the Military services (2005 Military Health Related Behaviors Study). Additionally, science has established the far reaching benefits of physical activity many of which directly impact readiness: Reduced musculoskeletal injuries (Reynolds 2002), decreased tiredness (Kryger 2004), improved heat tolerance therefore reduced risk for a heat injury (Wallace 2006), and reduced risk for depression and suicide (Magnusson 2006). In response, CNIC implemented an age specific Physical Readiness program (SHAPE) in September 2008. This program offers programming designed to educate and motivate senior personnel, 40 years of age and over, to achieve long-lasting health through permanent behavior change by providing services tailored to the specific physical and situational needs of each individual. The target population, level of service provided and location in Fleet concentration areas places the SHAPE program "front and center" therefore eliciting high level exposure and scrutiny.

Discussion: The SHAPE program is piloted in 3 Fleet concentration areas:

- Joint Forces Staff College in Norfolk, VA
- NAVBASE San Diego
- NAVSTA Pearl Harbor

SHAPE was implemented via NAF contract with Indiana University (IU) who provides staff (2 certified and degreed Fitness Specialists per location) and assists with program evaluation. Metrics include participant physical outcome data which is captured at 12 weeks and six months. Those metrics include the following with corresponding 12 week outcomes as of 30 June 2009:

- Pre and post VO2 max (measure of cardiorespiratory fitness) - 11.4% increase
- Muscular Strength- 10.3% increase
- Flexibility- 20% increase
- Weight- 2% decrease (total of 411 lbs lost)
- Body composition (percentage body fat) - 8% decrease

Additionally, program utilization is tracked monthly and as of 1 June 2009 SHAPE staff has conducted 2,788 one on one fitness training sessions and serviced 4,130 patron visits via group training sessions. Further, participants are asked to fill out a survey evaluating the SHAPE staff and when asked to rate their overall experience on a scale of 1 to 5 every survey returned a rating of 5.

Recommendation: Continue to develop our outcome measurement capability in the coming year utilizing other prominent program models in the industry as well as internal lessons learned for the purpose of determining future program viability.

Contact Information

Fitness, Sports and Deployed Forces
Commander, Navy Installations Command
Fleet & Family Readiness
Fleet Readiness (N921)
Washington, DC

SMART Body Composition Program SOP

MARINE COPRS BASES OKINAWA & CAMP SMEDLEY D. BUTLER
Okinawa, Japan

Purpose: To establish SMART Body Composition Program (BCP) guidance for warrior athletes, SNCOs and SMART staff.

Background: BCP failures are a leading cause for administrative separations in 2006 for many III MEF commands. This program is designed to eliminate BCP failures. With this program, warriors will lose about 1 pound per week and improve their PFT scores by increasing their physical activity, reducing their calorie intake and training effectively for the PFT. 12+ weeks is recommended.

Discussion: This program works in conjunction with the Okinawa SMART training for your best PFT which aims to increase PFT scores while reducing musculoskeletal injuries. Program offers general performance enhancing and injury preventing guides. Furthermore, it is done in coincidence with the losing weight protocols from CAPT D. L. Nichols and Becks Depression Screening self-test. Below are the actions associated with each individual involved in the program.

Action:

1. Warrior (patient):

- a. Bring SNCO, medical record with completed BCP paperwork and requirements to SMART for 1st visit.
- b. Provide confidential depression screen self assessment to SMART provider.
- c. Write goals in a log book log all physical activities, food / drink with calorie estimates.
- d. Log daily walking: time, distance
- e. Log body weight in pt gear at least weekly.
- f. Log SMART "Best PFT" protocol activity unless directed by the SMART provider to log "walk / run" protocol activity and SMART specific injury protocol activity instead.
- g. Have log reviewed and signed by SNCO weekly.
- h. Have log reviewed and signed by SMART staff every 2 weeks.
- i. Follow-up with SMART provider at least monthly.
- j. Communicate with SMART staff and SNCO as indicated.

2. SNCO:

- a. Attend initial SMART BCP consultation / education with their overweight warrior.
- b. Review and sign warrior's BCP protocol log and provide guidance weekly.
- c. Communicate with SMART staff and warrior as indicated.

3. SMART Corpsman:

- a. Educate SNCO and warrior regarding above responsibilities (actions). Provide copies of all handouts to both.
- b. Discuss pitfalls of doing too much (injury/pain) and not doing enough (poor results).
- c. Provide SMART "Run Walk", "Best PFT", "Stepwise Approach to Losing Weight" and injury specific protocols as indicated to SNCO and warrior with explanation.
- d. Review and sign warrior's log every 2 weeks. Log warrior's weight in PT gear. Provide advanced education or emphasis on doing the basics correct as indicated.

- e. Confidentially score warrior's depression screen and provide all screens to the SMART provider.
- f. A confidential physician evaluation will be arranged for all warriors with a positive depression screen.
- g. Document warrior evaluation and education.
- h. Warriors with medical conditions will also be treated per clinical SMART SOP.
- i. Encourage warriors to gain advanced education via internet or SMART clinic weight loss binder.
- j. Communicate with warrior, SNCO and SMART provider as indicated.

4. SMART Provider:

- a. Evaluate warriors with positive depression screens or arrange for appropriate medical evaluation as indicated.
- b. Evaluate warrior and log at least monthly and guide as indicated.
- c. Communicate with warrior, SNCO and higher command leadership as indicated.

5. Administration:

- 1. SMART LPO will ensure all SMART corpsman are trained to administer this program.
- 2. SMART LPO is responsible for training, annual review and update of this program.
- 3. The SMART physician will review and approve updates.

Recommendation: No recommendation provided.

Contact Information

Head, Sports Medicine Department
Naval Hospital
Camp Lejeune, NC

Waterfront Fitness Program

Commander Naval Installations Command (CNIC)
Washington, D.C.

Purpose: There are a multitude of fitness resources at Sailor fingertips, some of which are invalid and pose a significant health risk. Valid and reliable information is essential to the pursuit of Force and individual readiness.

Background: Science has established the far reaching benefits of physical activity many of which directly impact readiness: Reduced musculoskeletal injuries (Reynolds 2002), decreased tiredness (Kryger 2004), improved heat tolerance therefore reduced risk for a heat injury (Wallace 2006), and reduced risk for depression and suicide (Magnusson 2006). In response, CNIC implemented the Waterfront Fitness Program to provide training and instruction to better prepare Fleet Sailors for the physical requirements of their operational commitments and to offer programs that will assist them in maintaining their health and fitness while deployed. Programming initiatives are designed to provide physical fitness, nutrition and health education specific to the needs of deployed Sailors.

Discussion: The Waterfront Fitness program was implemented in November 2006 in the Mid-Atlantic region with 2 certified and degreed Fitness Specialists. A third Fitness Specialist has since been added.

Instructional courses and physical training sessions are provided to ships home ported at NAVSTA Norfolk. These courses and training sessions, many of which are "Train the Trainer", are based on sound exercise and nutrition principles therefore offering the FLEET a highly valued and reliable resource in the pursuit of physical fitness and health.

Fitness "done right" functionally relates to the mission thereby enhancing readiness. This physical preparation reduces the potential for injury thus resulting in a potential reduction in lost duty days. Additionally, Waterfront Fitness provides an ongoing reach back resource for commands at sea. Offerings and corresponding attendance in FY 10 include:

- ShipShape Facilitator Course – 129 instructors trained
- Group Exercise Facilitator Course – 141 instructors trained
- TRX Course – 87 instructors trained
- CFL Workshop – 243 trained
- Mission Nutrition/GMTs Nutrition – 85 trained
- CFL Certification Course – 157 CFL's certified

FLEET response to the program has been very positive and efforts are underway to POM for future expansion.

Recommendation: No recommendation provided.

Contact Information

Waterfront Fitness
Commander Naval Installations Command (CNIC)
Washington, D.C.