### FROM COLLEGE TO COMMAND—HUMAN PERFORMANCE OPTIMIZATION AND THE ARMY ROTC CADET

## HUMAN PERFORMANCE OPTIMIZATION (HPO) AND THE ARMY: A BRIEF HISTORY

At a luncheon in the fall of 2003, then Chief of Staff of the Army (CSA), General Peter Schoomaker declared, "humans are more important than hardware," which signaled a shift in policy that would focus on the warfighter over technology (2). United States Special Operations Forces (SOF) were first to implement a human performance initiative with Sea, Air, and Land Teams (SEALs) under Naval Special Warfare Command (WARCOM) and United States Army Special Operations Command (USASOC) with the inception of the Ranger Athlete Warrior Program (RAW) in 2007 under then 75th Commander Colonel Paul LaCamera (6). This model incorporated a human performance optimization (HPO) team comprised of an active-duty physical therapist, occupational therapist, and dietitian working with a non-commissioned officer operator and in concert with the rest of the medical staff for a holistic approach to HPO.

The success of the RAW program led to USASOC's Tactical Human Optimization, Rapid Rehabilitation, and Reconditioning Program (THOR<sup>3</sup>) (4). The THOR<sup>3</sup> model utilizes a mixture of government service and contract human performance personnel to support each SOF unit. Based on the RAW and THOR<sup>3</sup> model's conventional Army units have stood up their own HPO initiatives such as the 10th Mountain's Mountain Athlete Warrior (MAW) program (1,4). The current focus is to push HPO initiatives through Training and Doctrine Command (TRADOC) down to the initial military training level so soldiers entering the Army have a more holistic view of their health and fitness (5). Given the majority of officers in the military come from the Reserve Officer Training Corps (ROTC), ROTC cadets could be considered a target population for HPO initiatives. HPO programs in the ROTC setting may not only optimize cadets' performance, but lead to a greater understanding and more effective implementation of HPO initiatives throughout the military.

## UNITED STATES ARMY ROTC (AROTC) HPO: CADRE AND CADET PERSPECTIVES

Soldiers in today's Army should be exposed to realistic and stressful training scenarios. Additionally, they should be educated on the physical, psychological, and cognitive effects of combat and fatigue. AROTC cadets are an ideal training audience since they are already immersed in an academic environment. Most colleges and universities that have an exercise science (or similar) program need volunteers to serve as research participants. Therefore, a mutually beneficial collaboration may be had between exercise science and AROTC. This collaboration could help cadets by conducting physical training (PT) education workshops, helping to create PT plans, and conducting assessments to determine if the PT plan is resulting in the change in performance the AROTC cadre wanted. On a broad scale, these collaborations could develop into research opportunities and relationships between universities and the Department of Defense community.

Upon commissioning, cadets become second lieutenants and often platoon leaders, responsible for planning, resourcing, and managing the PT program within their organizations. Therefore, cadets need to be exposed to the previously mentioned education workshop, planning PT, and assessments to prepare these young leaders for the rigors of their jobs, as well as to develop confidence and critical leadership competencies. Considering this, contact and training time between AROTC cadre and cadets is limited. Therefore, cadet development must be sharply focused on maximizing performance and expanding PT concepts and techniques. Most of all, the concepts and techniques listed below are already a part of training doctrine and need dedicated attention to ensure their optimal implementation (3).

- When beginning to implement an HPO program into AROTC, the primary emphasis must be on injury prevention, followed by PT structure and training periodization.
- 2. PT plans for cadet-led programs must do more than Army Physical Fitness Test (APFT) improvement. While APFT performance is critical for cadet assessment, and the Army Physical Readiness Training program remains an effective tool, cadets are often not informed about how stress and fatigue impacts combat operations and training. Programs must include combat-focused PT as well as evaluation of mission tasks and skills under arduous conditions.
- 3. Cadets need to understand the effects fatigue has on their ability to make informed tactical decisions, as well as how physical conditioning effects HPO (this is often overlooked due to time constraints during the academic year). Incorporating these skills in training during demanding events, such as land navigation across rough terrain while carrying heavy external loads, will help cadets experience firsthand how fatigue causes performance degradation of even the most basic tasks. This also develops battle drill and Army warrior task training in these future officers. The optimal time for cadets to experience sustained physical fatigue is during regular field training exercises (FTXs). Oftentimes, regular FTXs will lack the training volume and intensity and will not limit sleep in a way that is similar

to what cadets will experience during cadet summer training. In turn, this may make cadets' first exposure to the combination of rigorous and sustained physical exertion with tactical mission analysis and decision making during this training.

- 4. There are numerous progression plans that cadets could use to train with a combat load. For cadets who have never rucked, as little as 10 lb might be enough load to cause physical stress. Selecting a load light enough to allow for at least a 30-min ruck is a good starting point. As with most training, only increase one training variable (e.g., distance, time, or load) by 10% each week. Also, consider alternating faster-paced shorter-distance rucks and slower-paced longer-distance rucks. Rucking once every 7 - 10 days will provide enough frequency for those new to rucking. For cadets who know they have a training event that requires a high-volume of rucking, it is important to begin training at least 12 - 16 weeks prior. This timeframe will allow for muscular, bone, and physiological changes to take place, and may even decrease the risk of overtraining injuries. Again, the focus on education and learning how to efficiently and effectively prevents injuries may increase recruiting and retention efforts.
- 5. Cadets need proper heat acclimatization prior to arriving at cadet summer training in order to be able to perform at their best. According to TRADOC Regulation 350-29, Most soldiers' physiological responses to heat stress improve within 10 – 14 days of exposure to heat and regular strenuous exercise (7). Educating cadets on the causes of dehydration can prevent them from becoming injured due to heat.
- 6. Restricting cadre at one university from leveraging support and resources available to them because similar resources are not available at other universities in the region does not maximize opportunities for cadet development. AROTC cadre should strive to resource and execute the best HPO program possible within their institutions.
- 7. Lastly, training must be mission-oriented and quantifiable. Soldiers should train as they fight, doing so will reduce the instinct to spend too much time on one form of training, which may cause overtraining and overuse injuries. Having data to help draw conclusions about a PT plan is useful. Data can help prevent overuse injuries, determine if performance was improved, and determine if the PT plan was worthwhile or needs adjusting. Furthermore, it is important to keep in mind that while APFT scores may not be indicative of combat performance, they are still a substantial part of a cadet's accession score (although this could be changing if the Army Combat Readiness Test or the Soldier Readiness Test is adopted). It is important to train and educate cadets in exercise science topics, but cadre cannot lose sight of the core fundamentals required

by cadet command, which is to train cadets to be future leaders in the Army.

### **ONE POTENTIAL MODEL FOR ROTC HPO**

Many issues, such as time, resources, and staffing, can prevent AROTC programs from implementing the best PT plan possible. However, having a training calendar for events and competitions would help the cadet by allowing them to know their schedule in advance, increasing the structure of PT to prepare cadets for each event that is ahead of them.

One potential model for the HPO could take a tiered ("good," "better," and "best") approach. The three components making up each tier are education, training, and assessment. The first tier is the most basic, but is still an improvement to the PT programs that lack structure and periodization. Keeping with the understanding that "humans are more important than hardware," for any of these components to be successful, mutually beneficial relationships between AROTC and other entities on campus must first take place. With that said, the "good" tier has little to no costs, they only require the time investment by professionals in varying areas of their college or university to communicate and share information with AROTC.

For AROTC programs who have formed relationships with the department(s) on their campus, such as human performance, nutrition, biomechanics, athletic training, etc., a more elaborate HPO program may be possible. The "better" tier assumes most of all components in the "good" tier have been achieved. Therefore, more attention can be given to further develop the HPP with the current resources of the program and the college or university. However, this tier will require a larger time and effort investment by cadre, cadets, and those departments who are collaborating.

A lack of resources may prevent the implementation of the "best" tier. However, many of the resources can be obtained through a loan or collaborating with other organizations. The "best" tier assumes that most of, it not all, components of "good" and "better" tiers are met.

These measures might seem elaborate or even far-fetched, but being part of an optimal AROTC program on a college or university campus; willingness and interest to invest time, space, and facilities to conduct the program; and having the monetary resources to purchase the equipment can lead to many of these components being implemented. A version of this tiered model was created and implemented at the primary author's university over the last three years. Faculty within the Department of Health Professions partnered with AROTC cadre and cadets to create an HPO program titled "Cadet Leadership Athlete Warrior (CLAW©)." This program utilizes yearly educational workshops, specialized training facilities, Certified Strength and Conditioning Specialists<sup>®</sup> (CSCS<sup>®</sup>), certified athletic trainers, and an array of assessment tests (e.g., Ranger Physical Assessment Test [RPAT], Ranger

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Athlete Warrior [RAW] assessment, Army Combat Readiness Test [ACRT], Occupational Physical Assessment Test [OPAT], etc.) in addition to the APFT. These efforts have changed the way cadets think, approach, and conduct PT, and have increased their durability to allow them to "go further, faster, and stronger" toward their mission. Additionally, this approach to education, training, and assessment has kept ROTC within the scope of Army training doctrine. Results from this program are a third-place finish by the Ranger Challenge competition team in 2016 (13th place the previous year), little to no reported injuries over the last 14 months (down from 16 reported injuries prior to the program implementation), and improved cadet morale (additional results from this program are being drafted for future publications).

#### TABLE 1. EXAMPLE OF A TIERED MODEL FOR HPO

	"GOOD"	"BETTER"	"BEST"
Education	<ul> <li>AROTC connecting with someone in exercise science, human performance, or kinesiology (or vice versa) for education guidance. Those in the programs listed above can share information listed in the bullet below (and more) with cadre and cadets within AROTC.</li> <li>Nutrition guidelines and tracking, principles of exercise, sleep hygiene, injury prevention, exercise programming, etc.</li> </ul>	<ul> <li>Moving past basic nutrition guidelines and tracking to focus specifically on the food options cadets have on campus.</li> <li>Work with a sleep specialist (if available).</li> <li>Have cadets attend stress and time management workshops offered on campus.</li> <li>Block off time in AROTC training calendar for HPO workshops (to get basic knowledge to new cadets and a more advanced focus for returning cadets in leadership roles).</li> </ul>	<ul> <li>Infuse the semester or yearly workshops with external subject matter experts in the areas the leadership believes cadets need the most improvement.</li> </ul>
Training	• Through the education component, training plan specifics can be discussed on how to "blend" aerobic fitness, muscular strength/ power, load carriage, and calisthenics in a way that meet the Army's training requirements and AROTC resource and time constraints.	<ul> <li>HPO professionals work with cadet leadership to teach them how to create training plans that meet Army requirements and train all components of fitness.</li> <li>AROTC works with campus fitness/wellness center to determine time and space to train.</li> <li>A trainer certified in tactical strength and conditioning in the fitness/wellness center, athletic trainers, physical therapists, and other medical professional available on campus to prehabilitate and rehabilitate cadets.</li> </ul>	<ul> <li>Continue to use the campus fitness/ wellness center and other training areas or develop and build a stand- alone training facility for AROTC. For programs at colleges or universities with master's programs in the area of HPO, graduate assistant or interns who are certified as CSCS or Tactical Strength and Conditioning Facilitators® (TSAC-F®) could be assigned to assist cadre and cadet leadership with training and assessment.</li> </ul>
Assessment	<ul> <li>Depending on the needs of AROTC, assistance can be provided on APFT preperation:</li> <li>Training leading up to the test</li> <li>Sleep hygiene</li> <li>Nutrition</li> <li>Data analysis</li> <li>Etc.</li> </ul>	<ul> <li>Conduct APFT and tactically relevant tasks utilizing current facilities and equipment.</li> </ul>	<ul> <li>APFT and equipment purchased via internal and external grants to conduct tactically relevant tests and assessments, such as the RPAT, RAW assessment, etc.</li> <li>Biometrics (e.g., Zephyr<sup>™</sup> and Readibands<sup>™</sup>) can be acquired to monitor training and prevent overtraining.</li> </ul>

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