# Optimizing Team Performance When Resilience Falters: An Integrated Training Approach

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**Abstract.** The U.S. Army strives to provide effective training for its soldiers. Part of this training is designed to build resilience, enabling soldiers and leaders to optimize personal readiness and performance in environments of uncertainty and persistent danger. Training complex tasks under high levels of stress is one way to support the development of resilience; another way is to train individuals in the use of specific resilience-based skills. Soldiers can use these skills not only to benefit their functioning but also to benefit the functioning of their teammates. The current paper reports on an innovative team-based approach to resilience training. Both the training content and training method provide novel approaches to addressing resilience in the context of high-stress scenarios. In terms of content, the training includes specific performance enhancement techniques that individuals can use to focus attention and optimize energy, and a method for intervening at the point-of-injury if a teammate experiences an acute stress reaction. In terms of method, the training includes classroom, virtual simulation, and live training. The resultant integrated training approach is Team Overmatch. This training milieu allows for the development, implementation, and evaluation of training modules fully embedded into tactical training. This paper discusses how innovative resilience strategies are integrated in a larger curriculum, including situational awareness, teamwork, and medical care, and how the training is being assessed in terms of knowledge and implementation.

**Keywords:** Resilience · Training · Military

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# 1   Introduction

The Army recently reprioritized efforts to shift psychological skills training away from traditional didactic approaches and toward new approaches that integrate skills in tactical training. To codify this reprioritization, the Department of Defense (DoD) and Army has provided objectives and guidance.

First, the February 27, 2012 (updated October 2, 2013) DoD instruction (No. 64 90.09) for DoD Directors of Psychological Health includes language that highlights the importance of psychological health. Specifically, this document states that the goal is to:

> [i]nstitutionalize a culture and structure to **promote psychological health**, fitness, readiness, mission performance, and prevention of psychological health problems and mental health illness… and support efforts to **enhance psychological resilience**, not only to reduce injury and illness, but also to improve the success of the warfighter in the psychological performance domain. (DoD Instruction No. 6490.09, 2013) [1].

Second, an Army Regulation published in 2015 calls for combat and operational stress control universal prevention such as "surveillance and mitigation activities to reduce or avoid stressors and increase Soldiers' tolerance and resilience to severe stress" (Army Regulation 600-63 (Army Health Promotion), 2015) [2].

Third, The HQDA EXORD 086-16 (Human Dimension 22 DEC 15) reinforces the importance of optimizing human performance: "The Army has the capability and capacity to **optimize the human performance** of every Soldier and civilian in the total force to improve and thrive in the strategic environment of 2025 and beyond." In addition, the objective is to:

> [e]nhance Soldier and army civilian health and physical readiness through an **individualized comprehensive training system** …[and to] transition and implement psychological, social, and neurological science and other technological advancements to **train teams of army professionals to improve and thrive in ambiguity** and chaos [3].

Taken together, guidance pushes the Army to focus on "training on demand" formats that are amenable to the operational landscape. Previously, Squad Overmatch (SOvM) was developed as a training platform to implement and evaluate an operator-centered approach to resilience and performance training. This platform serves as a basis for developing new integrated training that optimizes team resilience.

## 1.1   SOvM Study

SOvM was a multi-year effort focused on designing a training platform to increase soldier performance under stress. Combining Army and Navy investment, SOvM involved the implementation of an integrated training approach [4]. At its core, SOvM relied on Stress Exposure Training, a training model that incorporates three stages: (1) an initial stage, in which didactic information is provided regarding stress and stress effects; (2) a skills training phase, in which specific cognitive and behavioral skills are acquired; and (3) the final stage of application and practice of these skills under conditions that increasingly approximate the criterion environment [5, 6]. This methodology emerged in 2015 when over 100 team members from across branches of service, other government agencies, industry, and academia collaborated to examine

improve training effectiveness for military personnel. In 2016, a scientific study tested the effectiveness of SOvM's integrated training approach on acquiring new knowledge and understanding concepts, shifting attitudes, and improving proficiency.

In the 2016 SOvM study, participants included eight Army squads, each augmented with a medic. The research team collected measures of learning, cognition, attitudes, and performance. Squads in the experimental condition participated in a three-and-a-half day integrated training curriculum consisting of classroom instruction, virtual simulation-based training, and three live mission training scenarios in the outdoor McKenna urban training facility. This criterion environment was augmented with live role players and advanced simulation technologies (e.g., non-pyrotechnic explosives, interactive avatars, and medical mannequins). Squads in the control condition participated in one day of live training on the M2 and M3 scenarios with the same role players and technologies, but without the classroom instruction and virtual simulation-based training.

Squads were randomized such that half were placed in the integrated training condition and half were placed in the control condition. Soldiers in both conditions reported high levels of confidence in their own ability and their squad's ability to perform well prior to two of the live scenarios [7].

Furthermore, regardless of condition, SOvM was well accepted. Soldiers in both conditions demonstrated a strong willingness to take part and considered participating in the training to be important. In addition, training as a whole appeared successful. Study results showed that all participants increased their basic knowledge of Resilience and Performance Enhancement (RPE), as well as Tactical Combat Care (TC3), Advanced Situation Awareness (ASA), Team Development (TD), and After Action Reviews (AAR) content areas. Soldiers in both conditions were also positive about their teamwork processes, efficacy, cohesion, and performance, and in general, these attitudes increased in positivity over time. Soldiers in both conditions also rated the AAR climate following the live scenarios as supportive and positive [4].

Overall, the integrated training condition appeared to be more successful than the control condition. Squads in the integrated training condition performed significantly more TC3, ASA, and TD tasks than the control condition squads [4]. Soldiers in the integrated training condition also demonstrated significantly more effective behaviors during the AARs than the control condition squads.

*SOvM Study and Resilience.* In terms of resilience and performance enhancement, significantly more gains in resilience knowledge were found for the integrated training condition compared to the control condition. Given that these skills were essentially internal skills, there was no objective measurement of how these skills were implemented.

Nevertheless, following training, soldiers in the integrated training condition rated themselves as highly competent to highly proficient, whereas soldiers in the control condition rated themselves as advanced beginner to moderately competent after the live exercises. Given this difference in self-rated proficiency and the improvement in knowledge scores, the resilience and performance enhancement materials showed promise.

Based on the findings from the 2016 SOvM study, a follow-on program has been developed: Team Overmatch (TOvM). While the training as a whole has been updated to account for lessons learned from SOvM, the resilience and performance materials have been expanded to include a new component focused on team resilience. Not only are the resilience and performance skills discussed in terms of how they can be used with teammates, but a new training module has been developed that introduces what individuals can do to intervene if a teammate experiences an acute stress reaction. This training module provides unique information about how to maintain team functioning under extraordinarily stressful conditions.

While SOvM focused on individual resilience, TOvM will focus on enhanced individual resilience as well as team resiliency training. This training will provide the necessary skills for soldiers to recognize the signs of stress in themselves and their squad mates. Not only will they be able to recognize these signs (increased breathing, rapid heart rate) but they will know how to interpret them and ultimately mitigate the effect to ensure mission success.

## 2   The Training Challenge

Soldiers and Marines make life and death decisions under extreme physical and psychological conditions. They are challenged with managing these stressors while maintaining high levels of collective performance. When a team member is injured and unable to perform, it is up to the team to serve as first responders and provide critical care at the point of injury. This care needs to be conducted quickly and effectively under complex and potentially traumatic conditions in order to keep the team functioning and to sustain the injured so that they can be transported for further care. Yet just as team members need to know how to apply tactical combat care to the physically wounded, they also need to be proficient at managing cases of acute psychological stress in their team members (Fig. 1).

## 3   Objective and Approach

TOvM trains individuals in providing an immediate intervention in the event that a team member experiences an acute stress reaction. This intervention is designed to be provided at the point of injury (either during or immediately after a combat-related event) and is expected to immediately return the affected battle buddy back to functioning, and thus sustain the team's fighting capabilities.

This intervention is based on a protocol developed by the Israeli Defense Force (IDF). The IDF protocol, YAHALOM, is embedded in a larger program called "Magen" (which means "Shield" in Hebrew). Magen offers soldiers training in a 5-step process to use if an individual team member experiences an acute stress reaction. This 5-step process is designed for rapid delivery in the field and should take 40–60 s to apply. Various versions of training in Magen have been piloted; the current version is taught in a one-hour class. This class includes a short video [8] and emphasizes practicing delivery of the intervention. The content has been so well received by the
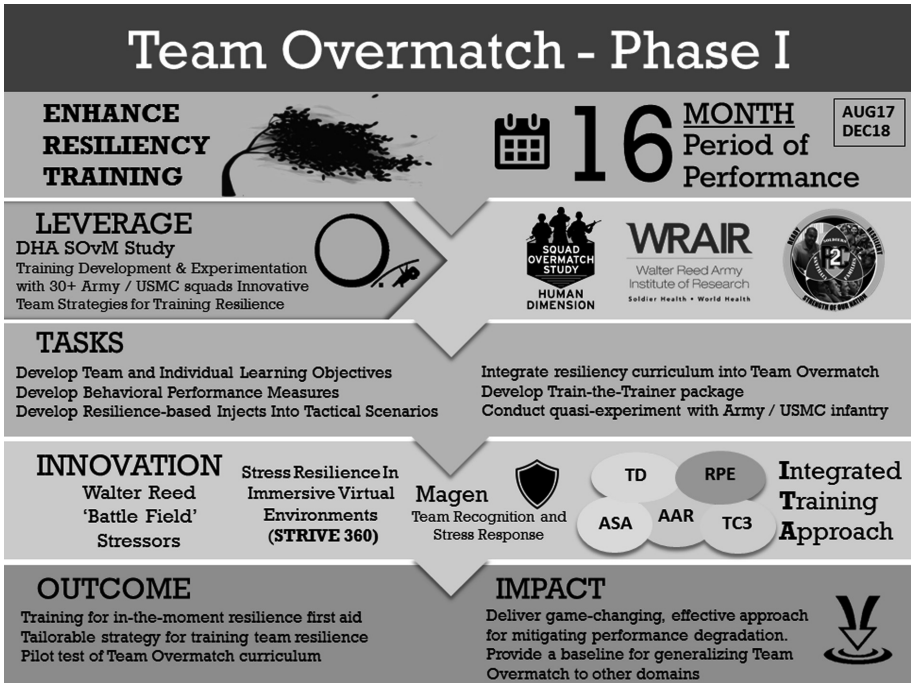
**Fig. 1.** Team Overmatch overview

IDF that as of 2017, Magen has become part of mandatory training that all recruits receive and all ground forces must demonstrate proficiency in the technique. Initial feedback from the field is positive. Anecdotal evidence from troop commanders indicates the training has already proved useful, and follow-on surveys are being administered (Lt. Col. Vlad Svetlitzky, personal communication).

The Magen material was originally shared in the 2017 US-Israeli Shoresh meeting, a biennial event designed to facilitate cooperation on medical research between the militaries of the two nations. Walter Reed Army Institute of Research (WRAIR) scientists serving as U.S. representatives to Shoresh discussed the potential for adapting this technique with the IDF. Following the meeting, WRAIR worked with their IDF counterparts to develop a US version of the Magen protocol.

Part of this discussion entailed the importance of recognizing the signs of an acute stress reaction. Magen, the IDF version of the intervention, covers 5 steps. In contrast, it became clear that the initial step of recognizing an acute stress reaction was an implied task. Thus, for the sake of clarity, the U.S. version of the training includes 6 steps. The first step is to identify an acute stress reaction in a team member; the remaining steps are equivalent to the Magen protocol.

The U.S. version of the training is called iCOVER. This acronym spells out the steps that a soldier should take to address an acute stress reaction in a team member (Fig. 2).

**Fig. 2.** iCOVER steps

The 6-step protocol is defined by the following procedures:

(1) **Identify a buddy in need:** look for signs of an acute stress reaction. While there are different types of how an acute stress reaction can be expressed, the common denominator is that the person is no longer functioning and this lapse is not due to physical injury

(2) **Connect:** break through the person's cognitive daze by making eye contact, squeezing their hand, and asking them to squeeze your hand back

(3) **Offer commitment:** break through the person's dissociation through a simple phrase reminding them that you are there

(4) **Verify facts:** ground the person in the present moment by asking 2 to 3 concrete questions related to the immediate situation

(5) **Establish order of events:** continue orienting the person through a brief situational report; provide one short sentence each about what happened, what is happening and what will happen

(6) **Request action:** restore the person by giving them a simple, externally-focused task that is relevant to the situation.

Training involves a brief explanation as to how the brain functions during an acute stress reaction, introducing the concept of an amygdala hijack, how iCOVER prompts the thinking part of the brain back into action, and what behaviors should be avoided during the intervention (e.g., shaking or shouting at the individual, delving into emotional topics).

The concepts behind Magen and iCOVER are based on a theoretical framework proposed by Hantman and Farchi [9]. This framework guides recommendations for how first responders should intervene during an acute stress reaction. Each of the model components are designed to help shift the affected person away from a position of helplessness and toward a return to functioning. The framework is defined by the six Cs: (1) cognitive, (2) communication, (3) challenge, (4) control, (5) commitment, and (6) continuity.

The first C, "Cognitive", is at the center of the model. "Cognitive" reflects the focus on returning the individual back to functioning by activating the prefrontal cortex. Each of the Cs help the individual's frontal cortex regain control from the limbic system and reduce disorientation. In the case of "Communication", verbal communication is used as a method to restore frontal cortex functioning. In the case of "Continuity", the goal of ordering events is to prompt reestablish the logical, chronological sequence.

The final three Cs ("Challenge", "Control", and "Commitment") are adapted from the work on psychological hardiness. These characteristics of hardiness are associated with more effective coping under stress and provide proactive ways to manage and perform under high-stress conditions [10]. In the framework, the first responder should intervene by leveraging strengths associated with hardiness. "Challenge" refers to prompting an individual to complete simple, specific tasks in order to increase their sense of self-efficacy and return to functioning. Traditionally, offering options enables the individual to reassert "Control" (although in the case of iCOVER, control is reasserted through providing an opportunity for the individual to respond to specific questions). By offering a "Commitment" to the individual, the first responder is reducing the individual's sense of isolation and dissociation.

Taken together, the six Cs framework provides a theoretical underpinning as to why Magen and iCOVER are expected to be effective. Furthermore, the essential steps of iCOVER are designed to be immediate and simple, consistent with the concepts of PIES [11] already used in the Army doctrine [9].

## 4    Hypotheses

The current study leverages the TOvM platform to assess the impact of training on ASR knowledge, recognition, treatment, and attitudes. In this quasi-experimental study, eight squads will be randomized into one of three groups: iCOVER Traditional (Experimental Group 1), iCOVER Simulation (Sim) (Experimental Group 2), and training as usual (Control Group).

To practice the recognition of and response to ASRs, the current Resilience Practical Application (within the MAGEN program) requires students to act out symptoms of ASRs and to verbally execute the ASR treatment protocol in groups. This traditional training approach will be utilized as iCOVER Traditional and compared to an alternative training approach that leverages the simulated environment to increase the fidelity of the practice. The alternative Resilience Practical Application (iCOVER Sim) will allow individual students to practice identifying simulated squad members who are experiencing an ASR and treating the ASR by selecting treatment options and

verbally executing the ASR treatment protocol in the simulated environment. The Control Group will not receive any training and practice in iCOVER.

There are two primary sets of comparisons in the current study. First, both Experimental Groups are expected to result in better ASR knowledge, recognition and treatment than the Control Group as measured by a Team Resilience Knowledge and Comprehension Test, a Team Resilience Practical Test, and observational ratings provided by Subject Matter Experts during live scenarios.

Second, the two different iCOVER Groups will be compared: iCOVER Traditional, which uses didactic and in-class practice with squad members, and iCOVER Sim, which uses didactic and simulation practice with avatars. The expectation is that iCOVER Sim Group will be more effective in cue recognition on a Team Resilience Practical Test, but those in the iCOVER Traditional Group will be more effective in providing treatment more quickly and accurately than those in the iCOVER Sim Group.

During training, the iCOVER Traditional Group engages in treatment verbally with squad members whereas the iCOVER Sim group will perform treatment through selecting a response from a list and executing treatment through avatars.

The use of a computerized virtual environment to provide consistent, repeatable cue patterns of ASR for avatars, instructional strategies (granular feedback provided on cue pattern recognition), and structured, consistent learning opportunities is expected to lead to more effective ASR cue recognition. While the fidelity of the most characteristics of the 'patient' team member is naturally higher in a traditional person-to-person setting, the fidelity of the ASR cues are expected to be lower. Soldier trainees, as patients, may not be able to accurately convey the complexity of an ASR. In this regard, avatars can provide more accurate timing and portrayal of ASRs.

## 5   Measures

Table 1 below lists and describes the subjective, objective, and performance measures to be collected during the TOvM study.

## 6   Method

The current study is to be conducted at Ft. Benning, GA. A combination of Army and Marine Squads were asked to participate in the study. The study will be covered by a protocol approved by the NAWCTSD institutional review board. All study participants will complete informed consent prior to participation.

Squads will be randomly assigned into one of the three conditions (iCOVER Sim, iCOVER Traditional, or Control). The **Control** group will receive the standard TO curriculum (ASA, TC3, RPE, and TD), with no team resilience (iCOVER training). In addition to the standard TOvM curriculum, the **iCOVER** Traditional group will also receive the team resilience classroom curriculum (iCOVER) and will complete the traditional practice of working in groups to switch off between exhibiting, observing, and treating ASRs. **iCOVER Sim** will receive the same classroom training as the

**Table 1.** Measures and descriptions of subjective, objective, and performance collected during the TO study.

| | |
|---|---|
| iCOVER knowledge and comprehension test | A multiple choice test to assess participant knowledge on resilience learning objectives |
| Motivation | On a scale of 0 to 100 for each question, respondents rate the importance (1 item) of and their willingness (1 item) to successfully utilize the training. A score closer to 100 indicates greater importance and willingness |
| Multiple affect adjective checklist – revised (STATE) | Participants select terms that describe how they "feel right now" or "how you felt during the training you just completed" |
| Observable behaviors performance measures for individual and team Resilience iCOVER | Behaviorally Anchored Rating Scales (BARS) are scales used to assess performance based on observable behaviors. Subject matter experts rate each behavior on a 5-point scale (1 = Beginner; 5 = Highly Proficient) The Targeted Acceptable Responses to Generated Events or Tasks (TARGET) Checklist is a structured observation checklist method used to design the SOvM scenarios for both virtual and live training exercises. Events were identified that were expected to elicit demonstration of specific resilience and performance enhancement skills within the skill areas and team resilience; acceptable responses to each of the events were determined a priori |
| Psycho-physiology | Respiration Rate will be measured to assess breathing patterns associated during specific time points in the scenarios. Heart Rate will be measured to assess physical activity during specific time point in the scenarios. Will be measured using the Equivital EQ 2 system. Inter-beat-interval will be measured as a measure of the cognitive effort put forth during the scenarios |
| Resilience and performance enhancement post-event Assessment Team resilience skills post VBS and live assessment | Respondents reflect on the training exercise, indicating whether anyone on their team (themselves included) experienced an acute stress reaction or used any of the tactical stress care skills |
| iCOVER self-reported skill proficiency assessment | Respondents rate their current level of skill (beginner, advanced beginner, proficient, and expert) on learning objectives |

(*continued*)

**Table 1.**  (*continued*)

| iCOVER knowledge and comprehension test | A multiple choice test to assess participant knowledge on resilience learning objectives |
|---|---|
| Team resilience practical test | Video-based situational judgment tests; participants will be shown a series of videos of actors who may be exhibiting signs of an Acute Stress Response (ASR) Participants then must decide whether the actor is experiencing an ASR and requires treatment. If the decision is made to treat, participants will complete the ASR treatment protocol. Afterwards, participants will be asked to identify which ASR cues/profiles were exhibited by the actor. Time and accuracy of recognition of and response to ASRs will be assessed |
| Team action Processes Attitudes: action processes, cohesion, efficacy, team resilience, and performance | Respondents rated 1 to 5 on a Likert-type scale the degree they agreed with statements that asked how well they thought their team performed together during the mission just completed. Processes such as coordination of actions and effective communication are probed. A higher score indicated better rated performance |

iCOVER group but will engage in a simulated activity (with a simulated fire team) in which they are placed in a combat simulation and observe before, during, and after a stress event. During the event, one of the simulated fire team members will exhibit an ASR. Each trainee will work individually to recognize which simulated team members exhibited ASRs, and will select and treat stress care treatment options (Table 2).

**Table 2.** Procedure representation for the experiment

|  | Control (without iCOVER) | iCOVER traditional | iCOVER Sim |
|---|---|---|---|
| Baseline surveys | X | X | X |
| Training on traditional SOvM | X | X | X |
| Team resilience Sim test (pre) |  | X | X |
| iCOVER traditional |  |  | X |
| iCOVER Sim |  |  | X |
| Team resilience Sim test (post) | X | X | X |
| Simulated and live scenarios | X | X | X |
| Post-training surveys | X | X | X |

## 7    Discussion

Squad Overmatch has been successfully implemented at several Army training sites. Based on lessons learned, the enhanced individual and team resilience modules will be integrated into the SOvM package, and will be included as part of the 2018–2019 operational implementation and transition efforts at additional Army sites. Furthermore, follow-on WRAIR studies are planned to assess the experience squads have with ASRs and implementation of iCOVER in real-world deployment contexts.

## References

1. DoD Instruction No. 6490.09 (2012)
2. Army Regulation 600.63: Army Health Promotion (2015)
3. The HQDA EXORD 086-16: Human Dimension, 22 December 2015
4. Townsend, L., Milham, L., Riddle, D., Phillips, C.H., Johnston, J., Ross, W.: Training tactical combat casualty care with an integrated training approach. In: Schmorrow, D.D.D., Fidopiastis, C.M.M. (eds.) AC 2016. LNCS (LNAI), vol. 9744, pp. 253–262. Springer, Cham (2016). https://doi.org/10.1007/978-3-319-39952-2_25
5. Johnston, J.H., Cannon-Bowers, J.A.: Training for stress exposure. In: Driskell, J.E., Salas, E. (eds.) Stress and Human Performance. Erlbaum, Hillsdale (1996)
6. Johnston, J.H., Gamble, K., Patton, D.: Stress Assessment of Military Personnel during a SET training program (in progress)
7. Squad Overmatch (SOvM) Phase II Final Report: Optimizing Warriors…Achieving Squad Overmatch…Saving Lives. PEO STRI, Orlando (2017)
8. Magen 5 Step Process. https://www.youtube.com/watch?v=t-QZgZd-PJ4
9. Hantman, S., Farchi, M.: From helplessness to active coping in Israel: psychological first aid, Chap. 32. In: Schott, E., Weiss, E.L. (eds.) Transformative Social Work Practice. Sage Publication (2013)
10. Maddi, S.R.: Hardiness: the courage to grow from stresses. J. Posit. Psychol. **1**(3), 160–168 (2006). https://doi.org/10.1080/17439760600619609
11. Lewis, S.J.: Combat stress control: putting principle into practice. In: Adler, A.B., Castro, C.A., Britt, T.W. (eds.) Military Life: The Psychology of Serving in Peace and Combat. Operational Stress, vol. 2, pp. 121–140. Preager Security International, Westport (2006)