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Tri-sector Partnership for Military Suicide Prevention: Developing, Testing, and Scaling Wingman Guardian Connect

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Abstract

Our tri-sector partnership (Department of the Air Force, University of Rochester, and SafeSide Prevention, LLC) developed, tested, and scaled up Wingman Guardian Connect (WGC), the first RCT-validated program shown to reduce suicide risk, depression, and occupational problems in a broad military population (Wyman et al., 2020). Using the Exploration, Preparation, Implementation, Sustainment (EPIS) framework (Aarons et al., 2011) adapted for a military context, we trace the partnership from an initial Department of Defense grant (2014) through data-driven program development, a cluster RCT demonstrating efficacy ($N = 1500$ active-duty personnel), extension to operational installations, and ongoing force-wide scale-up across 72 installations. The partnership produced three outcomes addressing long-standing barriers to reducing military suicides: (1) a network enhancement training model that replaced lecture-based prevention programming, (2) methods enabling randomized trials of universal prevention in non-clinical military populations, and (3) a data-informed implementation strategy incorporating a National Institute of Mental Health–funded hybrid effectiveness-implementation trial. We describe how the tri-sector model—combining academic research rigor, governmental policy authority, and private-sector operational capacity—overcame challenges including leadership turnover and intervention fidelity at scale. We conclude with recommendations for partnerships seeking to advance evidence-based prevention within governmental agencies.

Keywords Suicide prevention · Military prevention · Implementation science · EPIS framework · Tri-sector partnership

Equipping our nation's military with effective prevention programming is essential to a thriving military community prepared for its national security role. This requirement is especially urgent now when our nation's military faces geopolitical instability, recruiting headwinds, and ongoing concerns about military member well-being including social disconnection and suicide (Suicide Prevention and Response Independent Review Committee (SPRIRC), 2022; Willing et al., 2024). Access to health services is substantial across the military, yet at the outset of our partnership, no randomized-trial-validated programs shown to reduce suicide risk across broad military populations were in wide use.

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Most existing models were adapted from civilian contexts and carried doubts about fit and effectiveness.

This paper describes how the Department of the Air Force (DAF) and University of Rochester (UR) formed a long-running partnership to develop, rigorously test, and scale up an ecologically valid, unit-level program, Wingman Guardian Connect (WGC). WGC builds individual and unit-wide skills through 6–8 h of interactive training with members of a natural organizational unit (Wyman et al., 2020). Now the DAF's official evidence-based resilience program, WGC was validated through a randomized controlled trial (RCT) with 1500 personnel (i.e., Airmen within the U.S. Air Force).

Our partnership evolved to a tri-sector model when Safe-Side Prevention, a private social impact company, joined as a full partner during the current implementation phase to address needs in project management, implementation, and technology infrastructure. The DAF's own role also evolved, from research sponsor during early phases to co-owner and operational lead during implementation. We describe our partnership's evolution, key strategic decisions, and strategies to overcome obstacles and achieve results, including collaboration with funders to problem-solve and innovate. We also describe how sustained collaboration transformed three organizations with aligned but separate interests into partners with a shared mission—a process we argue is both underappreciated in prevention science and essential to achieving implementation at scale. This paper highlights three partnership outcomes, each addressing a programmatic or scientific barrier to progress in military suicide prevention.

Partnership Outcome 1: New Interactive Training Model with Authentic Skill Development WGC is delivered through a network enhancement training model that overcomes concerns about traditional lecture-style suicide prevention programs, such as lack of engagement and repetition of suicide warning signs that inform reluctant members what to avoid disclosing (SPRIRC, 2022). Developed collaboratively with DAF personnel, this new model uses interactive peer-to-peer sessions that engage and ensure participants learn skills from each other, while building group cohesion and shared norms to sustain impacts (Wyman et al., 2020). We present findings (previously unpublished) identifying a key pivot point in development of this new interactive training model.

Partnership Outcome 2: Methods for RCTs Testing Military Suicide Prevention Programs Outside Health Services RCTs of universal interventions applied to broad military populations are rare, especially with health outcomes like suicidal behaviors. Our partnership solved logistical and privacy challenges to complete a large RCT ($N = 1500$) showing WGC efficacy on suicide risk, depression, and work problems (Wyman et al., 2020).

Partnership Outcome 3: Data-Informed Implementation Strategy for WGC Scale-Up Without careful preparation for implementation, evidence-based programs often have reduced impact when practiced in the real world, a phenomenon known as "voltage drop." As WGC scales up to 72 installations worldwide, our partnership is using a data-informed process to refine implementation, enriched through a hybrid effectiveness-implementation RCT funded by the National Institute of Mental Health (NIMH) in 2023. This process has already yielded efficiencies and improvements.

Factors Motivating Formation of This Partnership

For decades, military suicide rates ran below those in the general population. Beginning in 2008, they began to climb. The active-duty suicide rate averaged 12.2 per 100,000 from 1996 to 2007, increasing to 16.1–18.5 per 100,000 from 2008 to 2011 (Department of Defense, 2012). From 2008 to 2019, rates rose 61% (Department of Defense, 2019), disproportionately impacting young, enlisted males. Concurrently, policy and research groups called for interventions that reduce suicide vulnerability by strengthening healthy social bonds (National Action Alliance for Suicide Prevention, 2014). For decades, military suicide prevention had focused almost exclusively on high-risk individuals: detection and treatment of those already suicidal, reducing barriers to care, and restricting access to lethal means during crises. These approaches save lives, but they cannot reach suicidal service members who never seek treatment (majority of military suicide decedents), nor do they address the toll that serious suicidal ideation and behavior exact on well-being, job fitness, and families.

Strengthening skills to build and sustain healthy relationships is a logical target for upstream prevention (Wyman et al., 2019). Strong relationship networks matter especially in military contexts, where service demands strain connections between personnel and those closest to them (IOM, 2013)—due to frequent relocations, extended separations, and institutional expectations (long hours, unpredictable schedules, mission primacy) that compete with other responsibilities. Most personnel navigate these stressors successfully; a substantial minority do not, and experience deteriorating relationships, mental health symptoms, elevated suicide risk, and impaired readiness (Bryan et al., 2010).

We use the Exploration, Preparation, Implementation, Sustainment (EPIS) framework (Aarons et al., 2011; Moullin et al., 2019) to describe WGC's origins, testing, and ongoing scale-up across the DAF, and to extract generalizable guidance for partnerships. The EPIS framework maps how organizations move from assessment of their resources, needs, and context through installation and sustainment of

an evidence-based program. It distinguishes outer context (e.g., policies, funding) from inner context (e.g., leadership, workforce), and highlights bridging factors connecting them. Developed in health system contexts, EPIS has been broadly applied; we note where military-specific features required adaptation. Table 1 summarizes partnership achievements across EPIS stages.

Exploration Phase

In the exploration phase, an organization considers the needs of its population and personnel, identifies the best evidence-based practice to address those needs, and considers what might need to be adapted, at the system, organization, and/or individual levels and to the practice itself.

Partnership Narrative

Partnership Launch

Against a backdrop of rising military suicides, the DAF and UR formed a partnership to pursue Department of Defense (DoD) funding (FY13 Applied Research & Advanced Technology Development Psychological Health Award Program). Our partnership launched with a 4-year grant awarded to UR (W81XWH-14–1–0322), with the Air Force-Surgeon General's Office (AF-SGO) as research sponsor.

Our project proposed to adapt a suicide prevention program (Sources of Strength; (LoMurray, 2005; Wyman et al., 2010)) that trains opinion leaders to disseminate a healthy coping framework. The UR team (Network Health and Prevention Program) had established Sources of Strength as a promising suicide prevention model in education settings. Specifically, an RCT (18 schools, $N = 2200$ students) demonstrated that student opinion leaders implementing this program increased healthy coping norms across the full high school population (Wyman et al., 2010). Subsequent RCTs showed Sources of Strength reduces suicide attempts when implemented with fidelity but loses effectiveness with improper opinion leader selection or messaging drift and misses isolated individuals—a high-risk group—whereas youth in more cohesive networks have lower attempt rates (Wyman et al., 2019, 2025, 2026). Our work identifying limitations of the opinion leader model and characteristics of protective relationship networks influenced the pivot towards a new "network enhancement" model that trains all members of a natural organizational unit together.

Assessing Fit of the Opinion Leader Model

Our partnership immediately launched evaluation of the proposed opinion leader model. AF-SGO co-designed and, with UR, conducted discussion groups with (a) early career personnel, (b) mid-career leaders, and (c) resource providers (e.g., family readiness). Critically, discussion groups validated the focus on relationship skills for early-career personnel (e.g., "difficulty with face-to-face communication hampers positive growth") but did not endorse the opinion leader model as a fit for DAF culture. Participants identified potential role conflicts: training early career personnel as leaders conflicts with role and rank. Other key findings: traditional prevention programming is "tuned out" because of lecture format (e.g., "death by PowerPoint") and has limited impact. Instead of the opinion leader model, training for small units together was endorsed to enhance culture.

Data-Driven WGC Development

With DAF members rejecting the opinion leader model, we sought to address this central challenge first. The solution required extending the adaptation phase into a longer intervention development period, approved by the funder (Military Operational Medicine Research Program). Flexibility, both within our partnership and from the funder, was critical to achieving an ecologically valid and impactful WGC program.

A brief note on the Department of Air Force structure will help orient readers less familiar with the military. The DAF oversees the U.S. Air Force and U.S. Space Force (the latter established as a separate branch in 2019). The DAF groups its installations into Major Commands. Installations are organized into Wings, Groups, and Squadrons—the primary unit level for daily operational work. Most personnel serve in enlisted roles and progress from Basic Military Training followed by occupational technical training, then to an initial installation and its First-Term Enlisted Course (FTEC). Active-duty personnel relocate every few years. Civilian employees include members of the Primary Prevention Workforce (IPPW), who support installation-level prevention programming.

DAF leadership recommended beginning WGC with enlisted personnel in their initial occupational technical training. Sheppard Air Force Base (AFB; 82nd Training Wing) joined as a long-term partner in 2015. Sheppard AFB, the DAF's largest technical training operation, prepares 35,000–45,000 enlisted personnel annually across hundreds of job roles. Two training squadrons, the 365th (Avionics/Electronics) and the 363rd (Armament Systems), had the capacity and readiness to take on early piloting and endorsed the project as addressing unmet needs. Their distinct cultures strengthened generalizability. This period established practices for communicating with operational partners and preparing for leadership transitions (e.g., providing documents for new Commander briefings).

We designed a data-informed process to develop WGC that spanned 17 months. Ten cohorts of early career

Table 1 Tri-sector WGC partnership accomplishments by EPIS implementation stage

Exploration *Develop WGC and make the scientific and operational case for WGC adoption*	Preparation *Establish efficacy of WGC through gold standard RCT and extend to operational settings*	Implementation *Scale-up starting with early adopter installations and build implementation practices and infrastructure*	Sustainment (emergent) *Embed WGC in Air Force operations with reduced external support (emerging)*
1. DAF and UR launched partnership with DoD grant to adapt & test a suicide prevention program for Air Force personnel 2. Evaluated fit of proposed opinion leader model and determined it was not suited to DAF culture 3. Data-driven development and re-design process, adding group skills and shared purpose as core elements 4. Created network enhancement model to deliver Wingman Guardian Connect—training all members of an organizational unit together 5. Completed WGC program manual, briefed DAF leadership, establishing the foundation for the efficacy trial	1. Secured Sheppard Air Force Base (82nd Training Wing) commitment to a multi-year RCT 2. Integrated RCT design into the operational flow of personnel and training classes (216 units; N = 1,485), advancing scientific precision and human subject protections 3. Resolved Airmen privacy concerns about mental health data using computerized adaptive assessment and de-identification 4. Established WGC efficacy: RCT showed WGC reduced suicide risk scores, depression, and work-related problems through mechanism of more cohesive, healthy units 5. Extended and re-validated WGC at the next career stage—the setting targeted for scale-up—with a second DoD grant award	1. Launched WGC starting with 9 installations, training > 80 DAF personnel as facilitators; field experience produced a streamlined certification pathway 2. UR/DAF co-designed and initiated NIMH-funded hybrid effectiveness-implementation RCT (2023–2028) to test real-world effectiveness of WGC while refining implementation 3. Expanded partnership to tri-sector model, with SafeSide Prevention joining as a full partner contributing operational capacity, technology infrastructure, and strategic project management 4. Initiated transfer of DAF operational control from Integrated Resilience (A1Z) to Developmental Programs and Fitness (DPFZ), positioning WGC for force-wide rollout to all 72 installations (ongoing)	1. Establish self-sustaining facilitator certification at each installation through a distributed network of coaching and proficiency evaluators 2. Transfer Fundamentals Course to Air University, embedding WGC within the DAF's primary professional education institution 3. Maintain WGC fidelity and quality with reduced external partner support, sustained by dashboard monitoring and targeted technical assistance 4. Position WGC for adaptation to additional career contexts—Professional Military Education, family programs, and squadron-level delivery

personnel in technical training ($N = 296$) participated in pilot WGC modules, with enrolled participants completing pre- and post-training measures including engagement, retention of content (write-in responses), and nominations of classmates "they respect and would choose to spend time with" to assess healthy social bonds (wording recommended by military topic experts) (Wyman et al., 2020). Informed consent process and protocol was approved by Institutional Review Boards of UR and Department of Defense (Human Research Protection Office). After each cohort, a review of quantitative data and qualitative, narrative reflections informed modifications for the next cohort.

Here we highlight results that enhanced our collaborative design and shaped the training process and content of the new network enhancement training model to deliver WGC.

Pivot to Group Cohesion and Skills

With early-career Airmen prioritizing relationships with unit members, we examined patterns of relationship networks in the early career training classes. Figure 1 shows the structure of relationships among participants in four representative technical training classes (pre-training). In these small networks constructed from participant nominations, nodes indicate Airmen-in-training and the lines between nodes are respectful nominations (unidirectional or bidirectional). These data, shared with DAF partners, illustrate compellingly the variability in social connection status for both individual Airmen and training class units, with implications for health and DAF mission.

These data on unit networks engaged DAF partners, stimulated discussions on unit cohesion as an essential component for both member health and mission and rallied our partnership around developing WGC for individual and group skills. The principal investigator (PW) presented these findings at a DAF-wide meeting on suicide prevention that included the Chief of Staff of the Air Force (2018).

Group Skill Modules & Shared Mission Increased Impact

Based on early results, we revised WGC content and process in an iterative, data-driven process to emphasize career

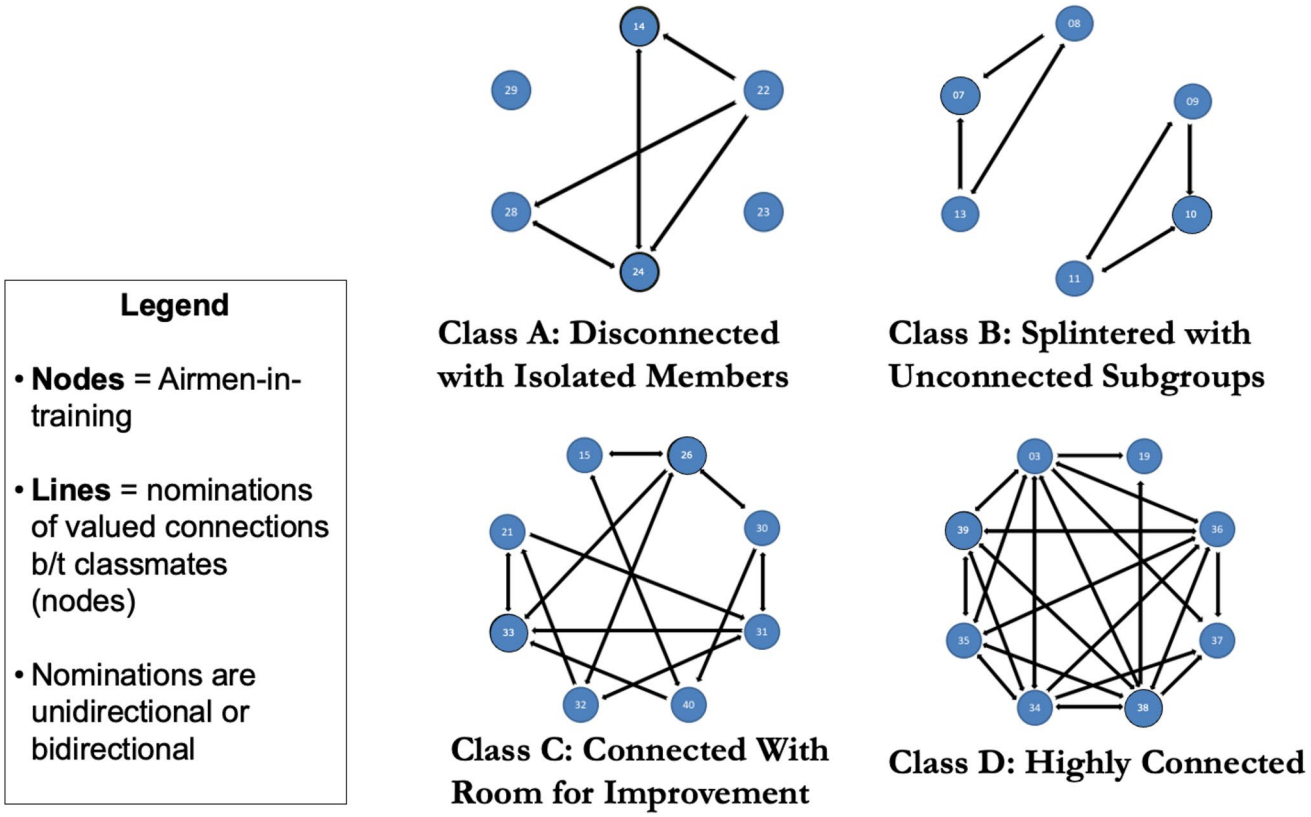

Fig. 1 Illustrative social network diagrams: classes of Airmen-in-training. Network diagrams from four technical training school classes illustrate a range of social connection patterns that Wingman Guardian Connect is designed to address. Class A contains isolated members with no peer connections—a known risk factor for suicide—and minimal unit cohesion. Class B is splintered into unconnected subgroups. Class C shows moderate connectivity with room for strengthening. Class D reflects a highly cohesive unit in which every member holds at least two valued peer connections and no one is isolated. WGC aims to shift classes toward the Class D pattern by building relationship skills and group cohesion during a formative career transition

relevance, group interaction, practical problem-solving, shared mission, and purpose. Several new group-focused modules were introduced midway through piloting. Participant evaluations over time showed that addition of group-focused modules increased impact on proximal targets. Knowledge retention (accurate recall of core WGC concepts using write-in responses) increased from an average of 75% in cohorts 1–4 to over 90% in the final cohorts 8–10 (see Supplemental Figure S1, available online). Similarly, participants' ratings of training benefit increased from the early to final cohorts, e.g., "This training prepared me to repair and strengthen relationships" increased from 76.5% to 97.8%; and "Wingman Connect training prepared me to identify mentors who can help my AF career" increased from 57.9% to 91.1%.

Completed WGC Network Enhancement Model

Our extensive development work culminated in an innovative network-enhancing framework to deliver WGC. In contrast to the proposed model, WGC trains all members of a natural organizational unit together. This new model's design draws on research on protective relationship networks (Wyman et al., 2019) and social learning theory (Bandura, 1977). Unit member skills are developed through modeling, discussion, and group norm development, not lecture. Rather than focusing on individual coping alone, targeted skills development enhances the unit's shared mission, designed to embed protective norms and practices into everyday unit culture.

Figure 2 shows WGC's distributed, interactive learning model. The curriculum develops individual and group skills that support four research-validated strengths essential to well-being and mission: Kinship (healthy bonds and mutual support), Purpose (meaning and commitment to mission), Guidance (seeking support and directing peers), and Balance (healthy routines and adaptive coping). Figure 3 summarizes individual and group skills participants gain through WGC. To extend those skills outside the training space, each group uses their WGC learning to strengthen cohesion or shared purpose through a Class Challenge. Follow-up text messages reference skills and promote natural dissemination of WGC across the base population. These messages are standardized, rather than individually composed, and are delivered automatically on a set schedule after training to reinforce skills.

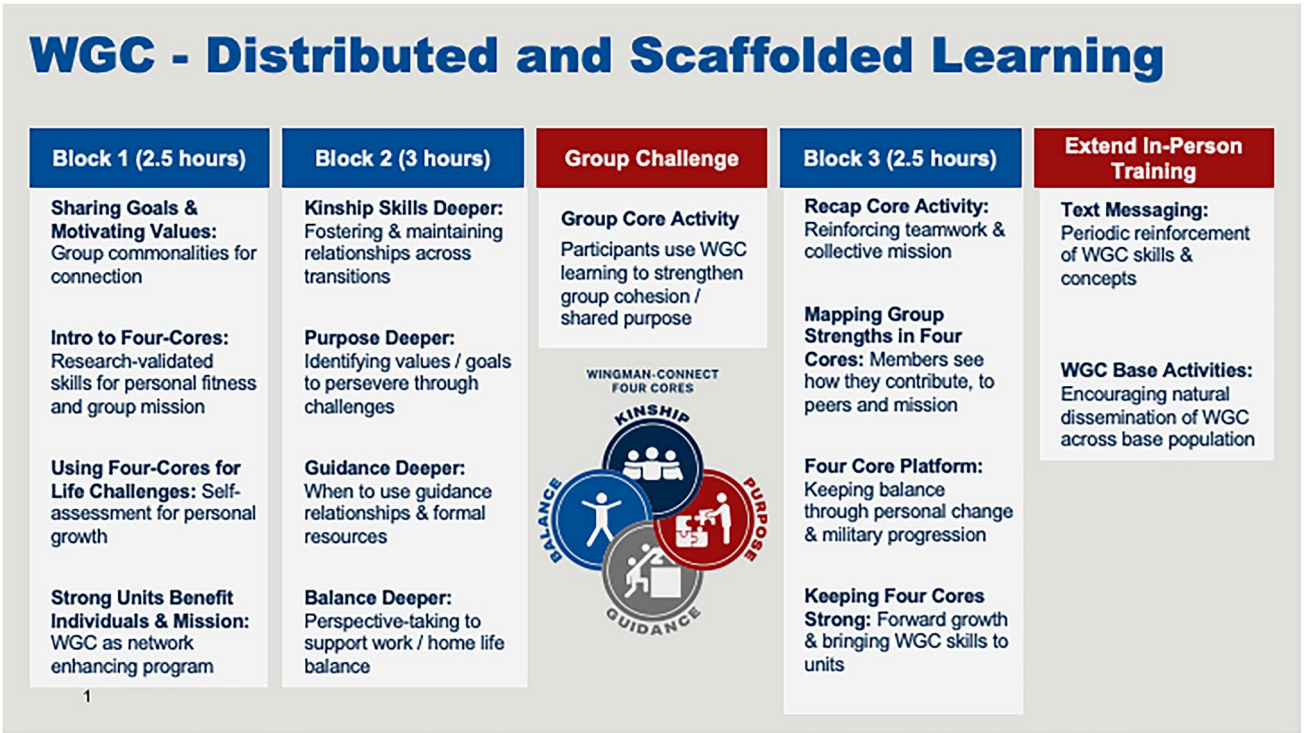

Fig. 2 Wingman Guardian Connect Program. The WGC Manual guides certified facilitators in delivering 6–8 h. of interactive training in three blocks, typically over three consecutive days. Learning occurs through structured peer-to-peer sharing, high-energy activities, and skill modeling

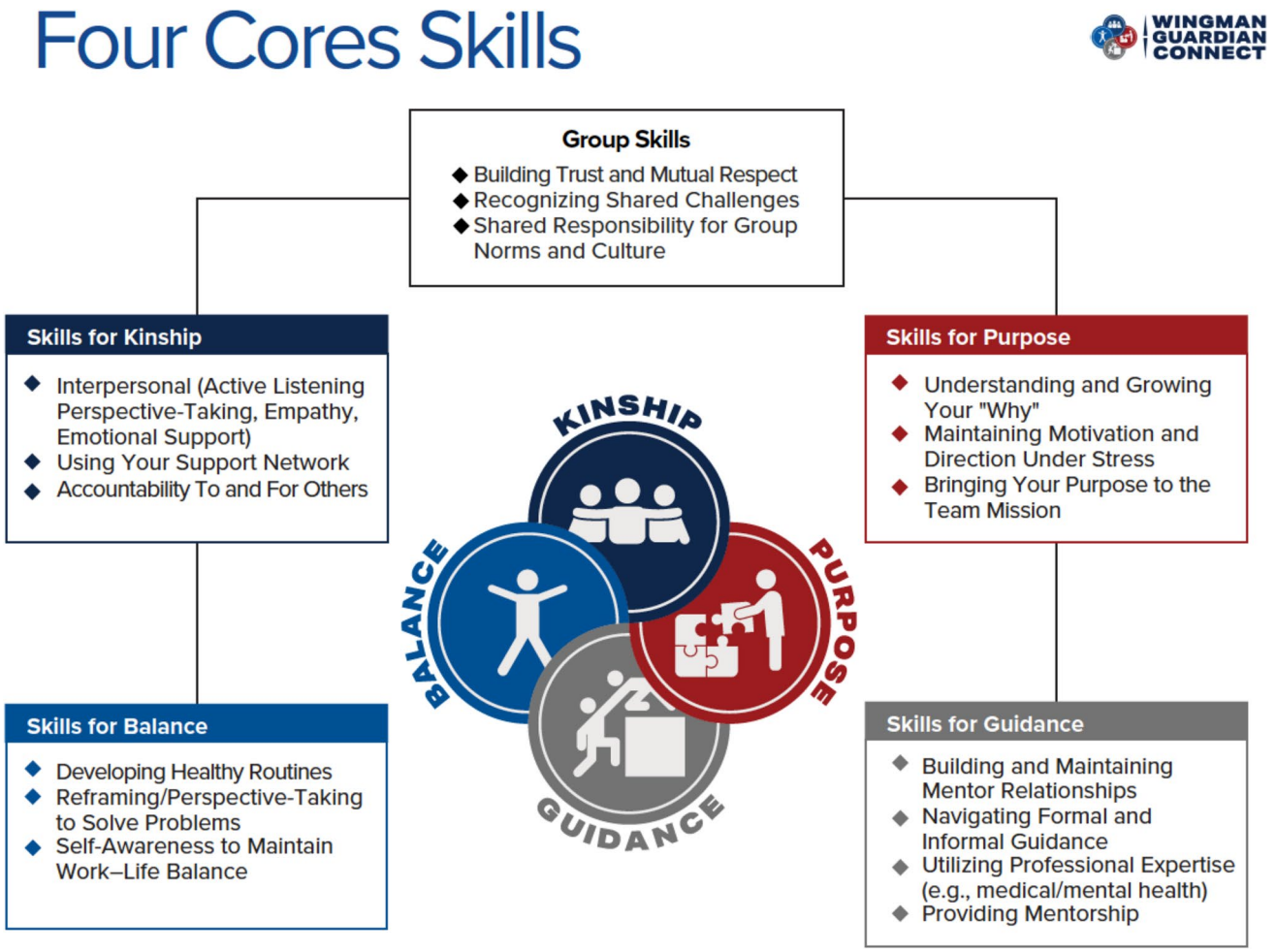

Fig. 3 Individual and group resilience skills participants gain through WGC

Preparation Phase

In the Preparation phase, the organization plans for integrating the identified evidence-based program into the current system including assessment of potential implementation determinants (i.e., barriers and facilitators of implementation) and develops a plan including defined strategies to capitalize on facilitators and address barriers. Following iterative WGC development and evidence of engagement and fit, the priority was scientifically establishing the program's efficacy with DAF personnel.

Partnership Narrative

Commitment to Multi-year RCT

Independent of partnership efforts, DAF formed the Office of Integrated Resilience (A1Z) to coordinate broader research, development, and policy efforts around resilience, interpersonal violence, and prevention (2017). This new office was a natural fit for our partnership and facilitated continuity for a multi-year RCT and planning for implementation. With advocacy and support from both AF Surgeon General and A1Z, the 82nd Training Wing committed to a multi-year RCT to evaluate the completed WGC program that they had participated in developing.

RCT Design Integrated into Base Operations

We developed several strategies for conducting an RCT that were critical to sustainment of the DAF commitment, validity of results, and protections for participants. As this group-RCT was conducted with classes of Airmen in technical training whose time is fully accounted for, Sheppard AFB organizational commitment was critical, with time for intervention delivery integrated into these Airmen's official schedules. Recruitment for research was held in locations with no DAF leadership present, and Airmen were eligible to decline participation while still participating in the intervention. No information about research involvement,

nor any individual data, was provided to the DAF, with study protocol approved by Institutional Review Boards of both UR and the Department of Defense (Human Research Protection Office).

Our RCT design was integrated with the flow of personnel. UR staff coordinated with each squadron (365, 363) to identify pairs of training classes matched on job, size, and start date. After informed consent and baseline assessments, one class was randomly assigned to WGC and the other to an active control (traditional stress management training), both delivered by UR personnel. After 24 months we met target enrollment (215 classes; $N = 1485$ Airmen enrolled), a rapid pace that sustained DAF commitment. Units assigned to WGC ($n = 107$) and control ($n = 108$) were closely balanced on demographics and class characteristics (Wyman et al., 2020), a precision especially important in group RCTs where the unit of randomization is significantly smaller than total *N* of subjects.

No compensation was provided to subjects during Airmen-in-training status (per DoD policy), but participants received $50 compensation for completing assessments (off-duty time) at the final 6-month follow-up, 2 to 4 months after arrival at their first base assignment (over 50 installations worldwide). Assessments occurred at baseline (pre-training) and at 1- and 6-month follow-ups. Retention was high: 92% at one month and 84% at 6 months. Combined with diverse job fields, high retention increased confidence in generalizability of our RCT findings.

Resolving Privacy Concerns About Mental Health Data

A major challenge was Airmen's concerns about privacy of their mental health data, information with implications for career progression. Standard suicide risk screening identifies as few as 1 in 7 suicidal military personnel (Vannoy et al., 2017), likely because career implications discourage candid responding. Resolving this required two strategies. First, we used a computerized adaptive test for suicidal symptoms (CAT-SS; (Gibbons et al., 2017)), for repeated assessment of suicide risk. CAT-SS administers a statistically optimal subset of items (tailored to each participant's ongoing responses) from a bank of 111 items syndromally associated with suicidal thoughts and behaviors. Because each administration selects different items based on prior responses, CAT-SS disrupts the rehearsed responding that repeated exposure to standard screening tools can produce—outperforming those tools while reducing participant burden. We likewise measured depression severity using the same adaptive platform (computerized adaptive test for depression [CAT-DI]; (Gibbons et al., 2012)).

Second, all suicide risk and mental health data were stored on the CAT-MH (Computerized Adaptive Testing for Mental Health) platform under a study identifier. The identifier linked each participant's own repeated assessments over time but could not be used to identify the participant. Data transfer to UR used a third-party broker that completed data de-identification, so neither UR nor DAF could link the data to any individual. To address safety concerns, all enrolled subjects received information about crisis services and resources, and consent documents indicated that no individual data would be used for crisis response. We reached consensus that this de-identification solution (approved by both Institutional Review Boards) was most likely to yield valid data while getting resource information to those who needed it. Rates of CAT-SS scores reported as above cutoff (7.7% with high probability of suicidal ideation) tracked rates expected for this age group (Rossom et al., 2017).

RCT Established Efficacy of WGC

Results showing WGC efficacy for early-career Airmen, specifically that WGC reduced suicide risk and increased unit functioning (Wyman et al., 2020), were instrumental for continued DAF investment towards implementation. Outcomes were analyzed using multilevel (mixed-effects) models that accounted for clustering of Airmen within training classes. To quantify impact, analyses calculated Cohen d effect sizes (ESs) for continuous measures and odds ratios (ORs) for dichotomous outcomes. WGC reduced suicide risk severity (ES = –0.23; $P = .001$), depression (ES = –0.24; $P = .002$), and anger (ES = –0.18; $P < .05$), and improved healthy career behaviors (ES = –0.18; $P < .05$). At six-month follow-up, WGC participants continued to report lower depression and directionally lower suicide risk (ES = –0.13; $P = .06$). WGC reduced by 20% the likelihood of elevated depression with high probability of diagnosis at either follow-up. In this general nonclinical population, these effect sizes are equivalent to state-of-the-art prevention programs targeting young adult populations where the majority are not at high risk (Brown et al., 2018).

Relevant to the DAF mission, WGC participation also reduced work-related problems. WGC participants had a 50% reduction in both corrective training (odds ratio [OR] = 0.51; 95% confidence interval [CI]: 0.31 to 0.82) and receiving a negative counseling statement (OR = 0.51; 95% CI 0.29 to 0.86). Meaningful for both DAF priorities and the program's scientific theory, WGC increased unit functioning (proposed network health mediators). WGC-trained groups had increased group cohesion, morale, relationship bonds, and healthy group norms (ES ranging from .18 to .23, $P < .05$). Formal mediation testing showed that WGC impact strengthening Airmen embeddedness in more cohesive, healthy units accounted for reduced suicide risk and depression scores (Wyman et al., 2020).

Protecting All Airmen While Reaching "Hidden Risk."

Although WGC was designed as an upstream preventive intervention, RCT findings showed WGC benefiting Airmen across the entire risk continuum (defined by baseline mental health symptoms). The greatest benefit on increased social connection was for Airmen with existing elevated suicide risk. WGC-trained units brought at-risk Airmen closer to peers—whereas in untrained units those at-risk members became more isolated over time, a well-established risk factor for suicidal behavior (Wyman et al., 2022). WGC thus addresses a critical gap in military suicide prevention: most service members who die by suicide are not identified and receive no mental health care. By strengthening peer networks and unit cohesion, WGC reduced suicide risk without requiring individual identification (Wyman & Pisani, 2025).

WGC Extended and Re-Validated at Next Career Stage

As capstone to the RCT phase, we disseminated findings across the DAF, other military branches, and beyond. Knowledge dissemination fulfilled a DoD grant obligation and initiated internal DAF discussions to determine how WGC could enhance prevention programming and identify potential pathways towards implementation. Importantly, this process marked a transition, from the DAF as research sponsor and co-developer towards implementer of WGC in regular practice. In this transition, we added multiple DAF operational partners.

DAF leadership supported extension of WGC to operational Air Force installations as the setting for greatest potential impact. The DAF Office of Integrated Resilience (A1Z) recruited Air Force Global Strike Command (AFGSC) as a partner and, in turn, three installations. With a second DoD research award (W81XWH-16–2–004), we evaluated WGC in the operational setting over 18 months.

We employed an implementation science approach called "scaling-out" for speeding translation of evidence-based programs to adjacent populations (Aarons et al., 2017). This design "borrowed strength" from the prior RCT by evaluating impact on a key WGC mechanism of new relationships formed, in addition to engagement, acceptability, and fidelity of delivery. WGC was delivered by UR certified trainers to 348 Airmen at their base during the First Term Enlisted Course (FTEC), the orientation newly arrived Airmen complete at their first base, delivered to each incoming group on a recurring schedule (a cycle), as a curriculum replacement for the current Resilience Skills training. Airmen enrolled as research participants (approved by UR and DoD Institutional Review Boards).

Airmen rated WGC as relevant and useful to their current career stage (95.9% post-training and 90.1% at 1-month follow-up), and 96.3% of all first-term Airmen in the 13 cycles completed the full training (i.e., reach). Content was retained post-training (94.1% accurate recall using write-in responses), and 89% reported using a WGC skill during the 1-month follow-up period. WGC built new social bonds among participants: 92.5% identified one or more classmate as a valued connection post-training ($M = 2.38$), with 96% retained at 1 month. Over 75% of post-training connections were among participants located in different squadrons, adding confidence these were not pre-existing relationships.

Implementation Phase

In the implementation phase, an evidence-based practice is initiated in the target setting, and implementation metrics are measured. For WGC, this phase began when the program transitioned from researcher-led delivery to delivery by DAF personnel across operational installations and is currently underway. The narrative below describes both what has been accomplished and what remains ahead. Successful implementation required solving two key challenges: maintaining program impact when delivered by DAF personnel (avoiding "voltage drop") and building the capacity for rapid scale-up by training hundreds of DAF civilian (primarily IPPW, Integrated Prevention Personnel) and uniformed personnel as facilitators to deliver an interactive program dependent on skilled facilitation. The tri-sector model, adding SafeSide Prevention as a third partner, emerged from this necessity.

Partnership Narrative

From Efficacy to Implementation

Publication of the RCT findings in JAMA Network Open (Wyman et al., 2020) and our subsequent demonstration of WGC's validity on operational installations generated momentum across the DAF. Operational leaders saw WGC's impact on unit cohesion and occupational performance (outcomes directly relevant to their mission) alongside the suicide prevention benefits. Integrated Resilience (A1Z), the DAF's research and policy office for prevention programming, designated WGC as the evidence-based curriculum update to the DAF resilience program, with mandated delivery during First Term Enlisted Course (FTEC) orientation at all installations. The Chief of Staff of the Air Force reinforced this designation in his annual letter to Airmen (October 2024). This senior leadership endorsement, an "outer context" factor in EPIS terms, accelerated enthusiasm on installations and catalyzed new partnership formation. The program was renamed from Wingman-Connect to Wingman Guardian Connect to reflect the establishment of the US Space Force in 2019, ensuring that Guardians were recognized alongside Airmen in the program's identity.

The designation also transformed the DAF's role in the partnership. Through Exploration and Preparation, the DAF functioned primarily as a research sponsor: facilitating access to installations, reviewing protocols, consulting on findings, and advocating within the institution for the project's continuation. With WGC designated as the official resilience program and mandated at every installation, the DAF became a co-owner—a shift that changed the partnership's center of gravity and created conditions for tri-sector expansion.

Demonstrating WGC's efficacy had required scientific rigor and logistical coordination at a single training installation. Making WGC work everywhere required a scalable implementation strategy plus capacity to train hundreds of facilitators, launch the program at dozens of installations, monitor quality across a worldwide organization, and sustain operations despite the military's dynamic environment.

Early Adopter Strategy and NIMH Hybrid Trial

Rather than attempt immediate force-wide rollout, our partnership pursued a phased implementation beginning with nine installations. This strategy served multiple purposes: systematic learning about what installation-level implementation required, developing a cadre of experienced facilitators and program managers, and, critically, providing the setting for a rigorous effectiveness trial under real-world conditions.

The early adopter strategy emerged through a productive dialogue about DAF's implementation needs and the scientific needs of prevention research. A staggered rollout was operationally necessary. Our partnership recognized this constraint as a scientific opportunity: because installations would begin at different times regardless, DAF leadership supported randomizing rollout order, enabling a rigorous stepped-wedge design. This willingness to embed randomization into an operational rollout reflected years of trust-building between the partners.

The resulting NIMH-funded hybrid effectiveness-implementation trial (2023–2028) tests WGC's effects when delivered by DAF personnel, the critical next stage in the translational pipeline. The trial uses a two-stage randomized design co-developed with DAF partners: a randomized controlled comparison of WGC to an active control at initial technical training (396 classes, 3000 Airmen), and a stepped-wedge rollout of WGC across eight operational installations (approximately 17,500 Airmen trained in FTEC over the study period). A distinctive feature is population-level outcome analysis: partnership negotiations enabled researchers to access aggregate installation-level suicide attempt rates from Air Force administrative records without compromising individual privacy. The DAF did not financially sponsor this study but was the program sponsor in the fullest sense: approving the design, facilitating randomization, and enabling collection of population-based data that most academic military researchers cannot access. The implementation science methods, selected and overseen by co-investigators at the UCSD and Northwestern University, assesses implementation determinants and mechanisms, producing a refined WGC Implementation Package and Military Stakeholder Report.

Site selection was deliberate. Our partnership chose installations across three Major Commands (Air Education and Training Command, Air Force Global Strike, and Air Mobility Command) with varying missions, sizes, and operational tempos to ensure lessons learned would generalize. Each early adopter installation brought a distinct implementation context. Approaches that succeeded at a large training installation required adaptation at smaller operational installations or in different command cultures. Major Command Integrated Resilience Office teams served as important bridging factors between the partnership and individual installations, facilitating communication and problem-solving between the outer context of DAF policy and the inner context of installation-level implementation.

Emergence of the Tri-Sector Model

The scale-up challenge made clear that a two-sector partnership, academic and military, could not succeed alone. SafeSide Prevention, a social impact company (a for-profit organized around a social mission) founded by members of the UR research team, joined as a full implementation partner in 2022. Several UR investigators hold a financial interest in SafeSide and operate under a University-approved conflict-of-interest management plan (see "Conflict of Interest"). SafeSide contributed capabilities that an academic team is not structured or funded to sustain: building and operating the digital learning platform, design of communication assets, project management, video production services, and rapidly recruiting and deploying staff across many roles and installations. Without these, force-wide rollout on the DAF timeline would not have been feasible. SafeSide also brought direct experience with force-wide military implementation, having led rollout of a suicide prevention training and policy improvement program across the Australian Defence Force (Druett et al., 2026). Founded from a university research context, SafeSide combines deep knowledge of suicide prevention with the operational agility of a private company. This orientation illustrates what mission-driven companies can bring to prevention implementation.

Facilitator Development as the Central Implementation Challenge

WGC's network enhancement model depends on skilled facilitation. Unlike lecture-based training where an instructor

delivers prepared content, WGC requires facilitators to manage group engagement, guide peer-to-peer interaction, and respond to participants' authentic interactions. These skills, assessed through a standardized Facilitation Skills Rubric, take more time to develop than straight content delivery.

The partnership addressed the well-documented problem of "voltage drop," in which implementation quality and effectiveness decline at scale. In prior UR research, fewer than one in five trainers certified through workshops alone delivered another suicide prevention program well (Cross et al., 2014). These findings supported the DAF decision to base WGC certification on demonstrated performance rated by a trained certifier.

WGC's facilitator development pathway was designed to prevent voltage drop. The streamlined certification process that emerged from early adopter experience requires three elements: (1) completion of the WGC Fundamentals Course (approximately 40 h of intensive training in WGC principles and methodology), (2) co-facilitation of at least two FTEC deliveries with real Airmen under observation and coaching, and (3) documented demonstration of competency using the standardized skills rubric. Certification requires demonstrated competency in the target environment with real Airmen, not completion of training alone. This requirement is rare in civilian prevention programming but familiar in military culture, where demonstrated competency in operational conditions is standard practice for many other skills. The alignment between WGC's competency-based certification and the military's existing performance culture was an implementation facilitator that our partnership did not initially anticipate.

The pathway evolved through implementation experience. Early cohorts of facilitators required more co-facilitation cycles before reaching proficiency. As the training team refined the Fundamentals Course and coaching procedures, the process became more efficient, yielding an approximately 30% reduction in facilitator certification time while maintaining fidelity standards. This kind of iterative improvement is what the tri-sector model was built to enable.

Fidelity Monitoring Infrastructure

Maintaining program quality across nine installations, and eventually 72, requires systems and procedures that did not exist at the outset. The partnership developed several approaches that carry forward into Sustainment. A standardized skills rubric enables consistent competency assessment across sites and evaluators, serving both developmental purposes (helping facilitators improve) and accountability purposes (verifying that installations deliver WGC as designed). Onsite and remote coaching procedures allow experienced coaches to observe and provide feedback, supplemented by audio recording of sessions for quality review and calibration across sites. During the early adopter phase, our partnership also began developing a coaching and proficiency evaluation role for experienced facilitators and program managers at each installation, enabling them to eventually certify new facilitators locally and laying groundwork to be fully realized in the Sustainment phase.

These procedures serve the ongoing challenge of ensuring that Airmen receive the WGC program that was proven effective. In contexts where programs are often rolled out without rigorous evaluation, it can be tempting to focus on delivering a program rather than achieving the outcomes research demonstrated. This distinction requires constant communication and attention to implementation, particularly because WGC's identified mechanisms (network enhancement, norm change) depend on specific facilitation practices that can erode without deliberate maintenance.

Transition of Operational Control

As WGC moved from research-driven early adoption toward force-wide delivery, the DAF initiated a transfer of operational control from Integrated Resilience (A1Z), which had overseen WGC through research and development phases, to the Developmental Programs and Fitness Division (DPFZ). A1Z retains program and policy oversight. DPFZ is assuming operational authority: deciding launch sequences, refining procedures and assets, and managing coordination with Major Commands and installations. This transition to an operational division reflects the program's maturation from a funded initiative to an institutional capability.

The transfer does not immediately reduce the need for external partner support; it redirects it. Standing up an installation requires intensive, time-limited resources distinct from those needed for ongoing operations. During force-wide rollout, UR and SafeSide Prevention continue to provide launch support: preparing installation personnel and leadership, conducting Fundamentals Courses through mobile training teams, and co-facilitating initial deliveries until new facilitators achieve proficiency certification. This investment is designed to diminish as each installation matures and becomes self-sustaining–the point at which Implementation, for that installation, gives way to Sustainment.

Emerging Sustainment

In Sustainment, WGC becomes embedded in operations and maintains effectiveness with reduced external support. This phase begins after launch at all installations, targeted for September 2028. Reaching that steady state requires the UR and SafeSide Prevention teams to recommend and support DAF processes, personnel pipelines, and quality assurance

systems through which the DAF can maintain delivery quality indefinitely. Table 1 lists key accomplishments.

Partnership Narrative

Force-Wide Rollout Phase

Before Sustainment can begin, WGC must launch at every Air and Space Force installation with First Term Enlisted Courses–approximately 72 installations worldwide. The Force-Wide Rollout Phase (May 2026–September 2028) represents the partnership's most operationally intensive period. During this phase, SafeSide Prevention moves to the forefront, deploying mobile training teams that continue to draw on UR expertise but assume primary responsibility for execution under DPFZ operational control. The rollout follows a structured process for each installation. Pre-launch activities begin approximately 90 days before the first Fundamentals Course, including leadership engagement, logistics coordination, and identification of facilitator candidates. SafeSide's Mobile Training Team delivers the Fundamentals Course at the installation or a regional hub. Following the course, a 90-day certification window allows new facilitators to complete co-facilitation requirements and demonstrate proficiency, establishing the installation's capacity for self-sustaining delivery. Geographic clustering enables efficiency: installations in proximity launch in sequence, reducing travel costs while building communities of practice that persist into Sustainment.

Transfer to Air University

A milestone marking the transition to Sustainment will be assumption of responsibility for the Fundamentals Course by Air University, the DAF's primary professional education center. Achieving Air University course accreditation (initiated during Implementation phase) establishes WGC within the DAF's formal education infrastructure. During Force-Wide Rollout, SafeSide's Mobile Training Team conducts courses to meet demand. As Air University builds instructor capacity, course delivery transfers progressively. The goal is complete transfer: by Sustainment, Air University trains all new facilitators through normal DAF education channels.

Building the Coaching and Evaluation Network

Sustainable local capability depends on a distributed network of coaching and proficiency evaluators. The concept for this role emerged during Implementation, when we recognized that external partners were neither able nor intended to remain the permanent source of training and certification. A self-sustaining WGC requires military personnel to onboard new facilitators as experienced ones rotated to new assignments. Coaching and proficiency evaluators are experienced WGC facilitators who complete additional training in coaching, feedback delivery, and assessment standards, gaining authority to certify new facilitators at their installations to maintain quality assurance. Each installation requires at least one evaluator to manage the ongoing facilitator pipeline. Building this network is one of the Force-Wide Rollout Phase's primary objectives. Without sufficient evaluators distributed across installations, the program cannot sustain itself.

Reduced but Continued External Partner Role

Sustainment does not mean the external partners disappear. UR remains involved in curriculum updates as research findings or operational experience warrant; SafeSide provides surge capacity and supports program expansion. The NIMH hybrid effectiveness-implementation trial continues through 2028, with ongoing analysis and publication of findings. These continued activities represent a shift from operational execution to consultation, knowledge generation, and future extensions of WGC.

Building Coherence Across the Prevention Portfolio

One of the first questions installation leaders ask after introduction to WGC is "how can we get this program out across our base?" Military organizations often maintain an array of programs for a given problem that share neither language nor logic. Coherence—building outward from effective programs using shared frameworks—is an underappreciated added value. Prevention programming should carry a consistent framework from initial training through career transitions to separation, reinforcing protective relationships at each stage.

Extensions of WGC are in development for Professional Military Education, squadron-level delivery, and military families. Another extension currently being developed uses WGC's Four Cores framework to equip leaders and service members to have sensitive conversations about suicide and other risk situations. Because the language and framework carry through, cumulative benefit is more likely than from disconnected programs addressing similar problems. Each expansion would require its own shorter EPIS cycle—adapting curriculum, establishing engagement and acceptability, developing facilitator pathways, building sustainment infrastructure. The experience and data from FTEC implementation speeds but does not eliminate this process. Coherence should be a design principle for military leaders, especially as prevention is streamlined to support the warfighting mission.

Cross-Branch Translation

Reaching force-wide implementation and emerging sustainment has drawn interest from other military branches. The Department of Defense includes 1.4 million active-duty personnel across services that increasingly share installations and infrastructure. Under the joint basing strategy adopted in 2005, it is common for personnel from one branch (e.g., Navy unit) to be embedded within an Air Force installation. When an intervention aims for population-level impact, excluding co-located service members or offering them a different program undermines the logic of the approach.

WGC was developed for and validated with DAF populations, but the underlying network enhancement model addresses challenges common across branches: relationship disruption from frequent relocation, stigma barriers to help-seeking, and the need for unit cohesion. Preliminary data from 130 service members across other branches indicated high perceived relevance, with 93% agreeing that WGC with branch-specific adjustments would benefit their members. Translation to other branches will require new partnerships and EPIS cycles focused on adaptation and implementation. But because the core mechanisms of WGC are established, these efforts represent "scale-outs" rather than requiring re-establishment of fundamental effectiveness (Aarons et al., 2017). The tri-sector partnership provides the connective tissue: academic rigor to ensure adaptations preserve effectiveness, governmental authority to enable cross-organizational implementation, and operational flexibility to manage complexity.

Lessons and Recommendations

We present lessons drawn from this partnership's accomplishments across EPIS phases—some specific to military prevention, others applicable to any prevention partnership operating in a complex organizational setting. We aim for directness: each lesson reflects something this partnership learned through experience and would do again, or do differently, or recommend that others prioritize.

Modernize Prevention Training by Connecting It to the Mission

The Suicide Prevention and Response Independent Review Committee (2024) called for modernization of military prevention training, and that modernization requires rethinking the delivery model, not merely updating content. WGC achieved this through assiduous exploration of the end user: Airmen's and Guardians' motivations, the type of training that engaged them, and the operational environment surrounding them. Iterative, data-driven development over 17 months and 10 cohorts produced training that participants recognized as relevant to their careers and relationships—not as another mandatory briefing to endure.

The result is a program that functions simultaneously as a preventive intervention and a mission-relevant training experience. WGC's interactive model builds skills that support individual fitness while naturally developing the connections and cohesion that are fundamental to the military mission. Results from the RCT confirmed this: WGC reduced suicide risk and depression while also reducing corrective training and negative counseling statements by 50% (Wyman et al., 2020). Training that is embedded in participants' shared purpose and organizational role engages them; training disconnected from these things does not. This principle extends beyond the military. Workplace suicide prevention that relies on risk-and-detection models alone—without engaging participants around their own goals and relationships—has an engagement problem that no amount of mandating can fix.

If modernization is the goal, facilitator preparation and certification must become skill-focused and competency-verified. WGC's interactive, network-enhancing program requires facilitation skill demonstrated and verified by performance. This aligns with how the military already certifies operational skills, but not historically prevention programming. Modernization also requires deliberate de-implementation of outdated approaches. Our partnership devoted less attention to de-implementing the training WGC replaced than to WGC's own implementation. The result was a period of ambiguity at some installations where the prior program persisted alongside WGC, diluting messaging and facilitator investment. Future partnerships should plan for de-implementation from the outset.

Military Settings Have Unique Strengths for Prevention Research

Military environments are dynamic in predictable ways. Personnel on operational installations relocate on a regular schedule, and new personnel enter through structured onboarding at a steady tempo. This dynamism—a source of strain on relationships and a challenge to program continuity—is also a research-enhancing feature of the environment. Regular turnover means it is possible to recruit new, large samples or alter exposure to different training components using a fixed schedule. A military installation essentially turns over its early-career enlisted population every 3 to 5 years, an extraordinary opportunity for iterative research compared to civilian workplaces where tenure is often long and variable.

We are frequently asked how we managed to conduct two randomized controlled trials in a nonclinical military setting. Operational tempo can make randomization difficult to accept, but without it, "evidence-based" remains aspirational rather

than descriptive. Military leaders who facilitated the research process for randomization, embedding randomization into operational rollouts, made strong causal conclusions about WGC impact possible. The investment in randomization pays forward: the scaling-out framework (Aarons et al., 2017) holds that once a program's causal effects are established in one population, extending it to an adjacent population need not require a new efficacy trial testing whether the program works at all, but instead tests whether the established mechanisms hold under local adaptation. Because branches of service differ in culture, mission, and structure, cross-branch translation of WGC must still confirm its core assumptions (that relocation disrupts relationships, that help-seeking carries stigma, and that unit cohesion is protective) rather than presume the effects transfer intact.

Feasibility and Innovation Are Born of Flexibility

We entered this partnership with a specific proposed intervention model and found through systematic evaluation that it was not suited to the DAF environment. Rather than forcing fit, we undertook a fundamentally new development process. This required willingness to revise the guiding science and intervention paradigm—not a minor concession for a research team. Pivoting when warranted by data is where feasibility is found.

The DAF and funder played equally important roles. Both the DAF and MOMRP exemplified what we call *accountable flexibility*: frequent, detailed reporting on progress and decisions paired with high latitude to adapt. This funder permitted 17 months of iterative development, producing a fundamentally new intervention model. Without that flexibility, we would have been constrained to testing an intervention that did not fit. The military has a long history of incubating innovations that later transfer to civilian settings; funders who practice accountable flexibility enable that tradition.

Flexibility also means tolerating approaches that will not scale—at first. Organizations built for repetitive routines often develop "cultural antibodies" to resource-intensive processes, even temporary ones. Our partnership required intensive, hands-on facilitator development before a streamlined certification process could emerge. The early adopter phase, mobile training teams, and extended co-facilitation requirements were all investments that could not have been sustained at 72 installations. But they produced a process that can. The question is not whether the initial approach can scale, but whether it produces one that can.

Invest in Data Collection Systems for Sensitive Problems

Service members have legitimate concerns about their health data impacting their careers. Privacy and confidentiality are not only ethical necessities but scientific design requirements for ensuring valid data. Our partnership's investment in adaptive testing (CAT-SS), data de-identification, and data collection apart from military information systems yielded valid outcome data that less rigorous protections would have compromised.

The stepped-wedge trial component of the current hybrid effectiveness trial extended this principle. UR receives only aggregate monthly installation-level outcomes (suicide attempts), enabling population-level analyses while protecting individuals and units. Researchers should treat confidentiality design as integral to measurement strategy, not as an administrative hurdle to clear after the study is designed. Military partners, in turn, support valid research by providing de-identified administrative data and permitting third-party systems for data collection. In other settings, the specific concerns may differ, but the principle holds: for sensitive problems, the quality of data depends on the quality of protections.

Mission-Driven Companies Can Fill a Structural Gap in Prevention Implementation

In defense and technology, private-sector partnership with government is assumed. Prevention science operates differently: the dominant model is grant-funded academic research with nonprofits as implementation partners, and for-profit involvement is often viewed with suspicion. There is some basis for this concern. But the result is a structural gap. When an evidence-based program needs to scale, academic teams lack operational infrastructure and nonprofits often lack the staffing flexibility, capital, and technology capacity required. Mission-driven companies—organized around achieving outcomes rather than selling a product—can fill that gap. The key distinction is between commercial interest that reinforces fidelity, because the company's reputation depends on the program working, and commercial interest that undermines it. Frameworks for ethical, mission-aligned academic-private partnerships exist (Pisani et al., 2019) but have received limited attention in the prevention implementation literature.

Working across academic and military systems requires patient translation. Academic partners prioritize quality and fidelity; operational partners test requirements against manpower, repeatability, and reduced complexity. The productive tension in our partnership came from establishing clear expectations about decision points, timelines, and procedures for managing changes—not from eliminating the difference in pace of partners but from managing it. SafeSide learned to adapt to academic tempo and temperament while maintaining its usual velocity, serving as a go-between that explained each sector's constraints and translated them into workable decisions. Clear decision points, timelines, and

change procedures helped preserve program elements while streamlining delivery. This translational role built credibility with researchers and operational partners.

Conclusion

The WGC partnership demonstrates that a tri-sector model—combining academic research rigor, governmental policy authority, and private-sector operational capacity—can produce, validate, and scale a prevention program in a setting where such achievements are rare. The program that emerged was not the one originally proposed. The partnership that delivered it was not the one that began the work. Both partnership and WGC evolved through sustained engagement with each other and with the population being served. Three outcomes address long-standing barriers to military suicide prevention: a new network enhancement training model that replaced lecture-based programming, methods enabling randomized trials of universal prevention in nonclinical military populations, and a data-informed implementation strategy incorporating a hybrid effectiveness-implementation trial. Each required contributions that no single sector or partner could have provided alone.

The partnership's most important lesson may also be one hardest to operationalize. Over a decade of shared work, three organizations with aligned but separate interests developed genuine shared mission. The UR team deepened its understanding of military culture at a depth that changed how they approached prevention science. DAF leaders recognized the investment required for rigorous evaluation and pay-offs from this investment. The private sector partner, SafeSide, learned to translate between academic priorities for quality and fidelity and military requirements for manpower, repeatability, and reduced complexity. By helping each sector understand the other's constraints, SafeSide turned tensions in tempo and priorities into scalable implementation decisions. Each partner internalized the others' priorities.

We believe this convergence—not merely strategic alignment but genuine shared mission—is an underappreciated determinant of whether complex implementation partnerships endure long enough to produce results. It cannot be mandated by a memorandum of understanding or guaranteed by a funding mechanism. It is the product of sustained work toward outcomes that matter to everyone at the table.

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Data Availability Contact the first author.

Declarations

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