

LAW ENFORCEMENT & TACTICAL MEDICINE

An Ongoing Series

Fresh Whole Blood Transfusion

Perspectives From a Federal Law Enforcement Agency Tactical Program

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Introduction

Civilian law enforcement tactical medicine programs have long drawn significant influence from their military Special Operations counterparts.^{1,2} Lessons learned from battlefield medicine have been, and continue to be, adapted and translated to inform and positively impact civilian casualty care practices.³ One of the most widely studied is the now well-established approach to field expedient management of life-threatening hemorrhage. The critical importance of early bleeding control is now well established in the civilian tactical medical and trauma arenas.⁴⁻⁷

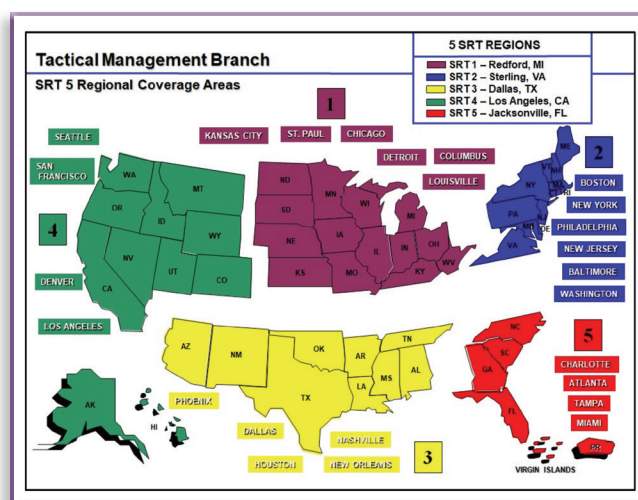
Prehospital management of hemorrhagic shock continues to be a focus of active study with formative influence also drawing from combat theaters. The United States military's Committee on Tactical Combat Casualty Care (TCCC) guidelines call for whole blood as the resuscitation fluid of choice for those in hemorrhagic shock.⁸ The military has long utilized the practice of fresh whole blood (FWB) transfusions from "walking blood banks" of donors amongst its deployed personnel.⁹⁻¹¹ In 2016, US Special Operations Forces began utilizing low titer group O whole blood (LTOWB) for use at points of injury.^{12,13} Further, the experiences of international Special Operations Forces performing FWB transfusion have been reported.^{14,15} This collective and mounting evidence for the merits of fresh whole blood transfusions in exigent field circumstances have escalated interest, particularly within the tactical medicine arena, for potential civilian prehospital applicability.

Workforce buy-in and engagement is essential for the success of any potential law enforcement fresh whole blood program. Agency leadership must be well informed regarding the attitudes and perspectives of its at-risk operational personnel, specifically those individuals anticipated to comprise the donor and recipient populations. This study surveyed such key perspectives amongst personnel within the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) Special Operations Division (SOD) with regards to willingness to participate in a potential FWB transfusion program.

ATF Special Response Team

The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) under the US Department of Justice (DOJ) is the primary agency responsible for administering and enforcing the criminal and regulatory provisions of federal laws pertaining to the illegal use and trafficking of firearms, destructive devices (bombs), explosives, commercial arson and the illegal diversion of alcohol and tobacco products.¹⁶ To help mitigate the inherent risks of this operational setting, ATF maintains a tactical Special Response Team (SRT) program with five teams geographically positioned across the United States (Figure 1). Established in 1996, the SRT program responds to high-risk operations that involve the service of arrest and search warrants, robbery and home invasion investigations, undercover operations, rural operations and personnel tracking, canine operations, high-risk surveillance, precision marksmen and weapon systems, response to natural disasters, crisis/hostage negotiations and high-threat protection details.¹⁷

FIGURE 1 Geographic distribution of ATF Special Response Team personnel.



Source: <https://www.atf.gov/about-atf/special-response-teams>.

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ATF deploys specially trained Special Agent tactical medics in support of its high risk and multifaceted law enforcement operations. The ATF Operational Medical Support Program (tactical medic program) was conceived in the early 1990s following the operations that took place in Waco, Texas in 1992 at the Branch Davidian Compound. ATF's tactical medic program today is composed of approximately 70 providers nationally. ATF tactical medics are strategically distributed among 25 field divisions and the five SRTs around the country.¹⁸

Methods

A survey was administered to all operational personnel from ATF Special Response Teams (SRT), Crisis Negotiation Teams (CN) and Tactical Medic (TM) Program who attended regularly scheduled mandatory trainings between October, 2019 and February, 2020. Prior to completing the survey, all personnel received a standardized in-person informational briefing covering a basic overview of blood components and typing, standard blood transfusion and the potential risks and benefits of FWB transfusion. The informational briefing was presented nine times in total by the same study investigator to minimize variability in content and delivery.

Study participants completed a 15-question survey regarding their individual perspectives on their likelihood of participating in a potential agency FWB program. Survey participation was voluntary and anonymous. Participants were explicitly informed that by responding to the survey they were neither consenting nor refusing to participate in an actual FWB program. Summary statistical analysis of aggregate, de-identified data was performed using Excel (Microsoft, Redmond WA). Any free-text comments provided by respondents were evaluated by two study team members (SK, ML), with a third (NT) as tiebreaker if needed, and categorized as either generally favorable, neutral, or unfavorable with regards to FWB. This study was reviewed by the Johns Hopkins University Institutional Review Board.

Results

A total of 208 attendees were present for the FWB informational briefings and 193 surveys were completed by SRT (106), CNT (27) and TM (66) personnel for an overall estimated response rate of 92.7%. Nonrespondents included some individuals from other agencies and/or without direct operational roles not expected to complete the survey. In addition, a total of six ATF SOD participants who serve in more than one operational capacity (i.e., SRT operator and tactical medic) were instructed to respond only once. The distribution of years of experience in respondents' current operational role was bimodal, with 18% (35) reporting 2-3 years in current role and 64% (124) answering >5 years. More than a quarter, 27% (52), indicated prior operational experience with the US military. Only 1% (2) reported ever previously requiring an emergency blood transfusion under any circumstances. The vast majority, 94% (182) had not received any prior training or briefing about FWB. However, 99% (192) indicated they now felt they had a reasonable understanding of FWB transfusions. Table 1 contains the study questions and corresponding results.

Over half of respondents, 52% (101) indicated that they were very likely to participate in a potential FWB program, while 24% (46) indicated they were somewhat likely to participate; 15% (28) were unsure if they would participate, 6% (12) were

unlikely to participate, and 3% (6) would not participate. Regarding the need to have blood drawn and typed in advance, the majority were either very likely 77% (144) or somewhat likely 12% (23) to participate. As far as undergoing routine periodic blood screening for transmittable diseases, 72% (135) were very likely and 18% (34) were somewhat likely; 78% (147) were very likely to self-report high-risk behaviors and 12% (22) were somewhat likely.

The top concerns reported as barriers to participation in a FWB program were possible disease transmission 44% (85), followed by potential for transfusion reaction 37% (71). The final survey question allowed for free-text comments from survey participants. Of a total of 35 responses were recorded, 35% (n=13) were overall favorable, 20% (7) were neutral and 43% (15) were unfavorable towards a FWB program.

Discussion

In high threat operational scenarios, fresh whole blood may present a key resuscitative adjunct for the care of critically injured operational personnel, especially in austere and geographically remote settings. Consideration of fresh whole blood transfusion is especially poignant in the context of domestic disasters and large-scale active assailant scenarios which pose unique challenges to the timely and effective access to standard blood bank stores. The potential benefits to law enforcement tactical operators are particularly intriguing in the advent of ongoing successes reported by counterparts in the U.S military and coalition forces internationally.

The development of a civilian law enforcement agency FWB program presents complex challenges that may be broadly separated into administrative, operational, clinical, and safety categories. Barriers in any one or more may functionally render the implementation of such programs unsuccessful within a given law enforcement agency or department. A recent report by Fisher et al. describes a FWB program within a geographically cohorted subgroup of a state police tactical team and highlights the implementation and sustainment complexities of such a program.¹⁹ Federal law enforcement agency tactical "teams" are typically characterized by large numbers of personnel who are geographically dispersed around the country and brought together with some variability for regional or national deployments. These considerations add tremendous complexity to the potential development of FWB transfusion capability. Regardless of the degree of capabilities, depth of resources, and alignment of efforts within a specific agency or department, a FWB program cannot be expected to succeed if the participation rate among its operational personnel is low or perhaps even moderate.

Our study evaluated the attitudes and perspectives of a nationwide cohort of federal law enforcement operational personnel (composed of tactical operators, crisis negotiators and medics) regarding their willingness to participate in a potential FWB transfusion program. Across this study population the majority, 76%, of respondents were either somewhat likely or very likely to participate in such a program. Possible disease transmission and potential for transfusion reaction were the most frequent reasons given as potential barriers to participation.

Years of experience in current operational roles did not affect likelihood of participation in a FWB program; 75% of those

TABLE 1 *Fresh Whole Blood Survey Results*

Age (years)	<24 = 14	25–34 = 90	35–44 = 82	45–54 = 7	>55 = 0
Sex	Male = 170	Female = 22	Other = 1		
Team role (select all that apply)	SRT = 106	CNT = 27	Medic = 66		
Years in current role	<1 = 12	2–3 = 35	3–4 = 14	4–5 = 8	>5 = 124
Do you have any operational/tactical experience in the United States military/D.O.D. (any branch)?	Yes = 52	No = 141			
Have you ever required/received an emergency blood transfusion, under any circumstances?	Yes = 2	No = 191			
Prior to today, have you ever received any training or medical briefing(s) on fresh whole blood transfusions?	Yes = 11	No = 182			
Do you feel you have a reasonable understanding of how Fresh Whole Blood transfusions differ from standard transfusions?	Yes = 192	No = 1			
Do you feel you have a reasonable understanding of the potential benefits of receiving Fresh Whole Blood in an emergency?	Yes = 193	No = 0			
Do you feel you have a reasonable understanding of the additional risks of receiving Fresh Whole Blood?	Yes = 193	No = 0			
Based on what you know now, if a FWB program was developed by ATF, how likely are you to participate?	Very likely	Somewhat likely	Unsure	Somewhat unlikely	Very unlikely
	101	46	28	3	9
Please rate your willingness to participate: Donate blood (1=Very willing, 5=Very unwilling)	1	2	3	4	5
	116	19	10	11	32
Please rate your willingness to participate: Receive blood (1=Very willing, 5=Very unwilling)	1	2	3	4	5
	89	26	37	14	22
Please rate your willingness to participate: Donate and Receive blood (1=Very willing, 5=Very unwilling)	1	2	3	4	5
	86	32	31	18	20
How likely are you to agree to participate to have your blood drawn and blood type identified in advance?	Very likely	Somewhat likely	Unsure	Somewhat unlikely	Very unlikely
	144	23	13	4	4
How likely are you to agree to undergo routine periodic blood screening at regular intervals for transmittable diseases?	Very likely	Somewhat likely	Unsure	Somewhat unlikely	Very unlikely
	135	34	10	4	5
How likely are you to self-report any/all “high risk” behaviors (as described in the presentation) to program management?	Very likely	Somewhat likely	Unsure	Somewhat unlikely	Very unlikely
	147	22	7	4	8
Please indicate which of the following concerns may be a barrier to your participation in an ATF FWB program? (please check all that apply)	71	Potential for transfusion reaction			
	85	Possible disease transmission			
	22	Self-reporting of high-risk activities (privacy related to personal medical issues)			
	1	Religious beliefs regarding blood transfusion			
	34	All of the above			
	4	Other			
	32	Choose not to respond			

with >5 years and 78% of those with 5 or fewer years in their current role were somewhat likely or very likely to participate. Prior military service similarly did not affect likelihood of participation, with 70% in this subset indicating either somewhat likely or very likely to participate. While these results are overall favorable towards the development of a FWB program, it must be noted that 10% of respondents were either unsure or unlikely to self-report high-risk behavior and similarly 10% were either unsure or unlikely to undergo routine blood screening for communicable diseases.

Limitations

Limitations in this study include those intrinsic to research involving de-identified survey methodology. This study did not assess administrative, technical and operational considerations

intrinsic to the development of a FWB program. As such, study participants were not surveyed regarding their perspectives related to these factors. While overall response rate was very high (>92%), the study population was limited to the operational personnel within a single federal law enforcement agency. As such, these results may not be generalizable to the entire federal tactical workforce. Caution must also be exercised in extending any conclusions to the broader law enforcement community, acknowledging significant differences in resources, logistics and support that may exist between federal, state and local agencies and departments.

Conclusion

This study provides unique insight into the willingness of operational personnel within a single federal law enforcement

agency to participate in a potential fresh whole blood transfusion program. These results are overall positive in terms of potential participation rates within the agency studied although it is noteworthy that a distinct cohort of respondents indicated unwillingness to participate. Hesitancy regarding safety measures related to screening and prevention of transmissible diseases may present challenges that require further analysis. This report sheds light into some of the potential human factors-related considerations which may help guide law enforcement FWB program development and implementation.

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