Expectant Casualty Care Training Needs for Future Conflicts

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ABSTRACT

Introduct ion:

The demands of future large-scale combat operations may require medics and corpsmen to increasingly perform expectant casualty care (ECC). However, no detailed guidelines currently exist for providing ECC within military medicine. To guide the development of education and training guidelines and advance team training of both medics and non-medics, an in-depth understanding is first needed regarding caregivers' experiences providing ECC in recent conflicts as well as perceived training gaps. Therefore, this study explored the experiences of medics and physicians providing ECC and investigated their perceptions of training needs in this area for future conflicts characterized by large-scale combat operations and prolonged casualty care operational settings.

Materials and Methods:

We conducted an engaged qualitative phenomenological study to explore ECC training needs for future conflicts. We interviewed 9 senior health care professionals (medics and physicians) who had extensive combat and deployment experiences and served primarily in the Role 1 environment. The interviews averaged 45 min each and were conducted via phone. To analyze this interview data, we reviewed the interview transcripts and then noted terms, phrases, and concepts within the interview transcripts that we found to be salient to answering the research question. Our team then met to review these codes and grouped them into categories. These categories served as the themes of this study that illustrated the participants' perceptions and experiences.

Results:

Five themes emerged from our data: (1) There is a current gap in ECC training for enlisted Role 1 caregivers throughout the military; (2) ECC training is needed to shift organizational culture; (3) ECC training should be comprehensive; (4) ECC training should be deliberate; and (5) Time is the greatest challenge to implementing ECC training. Our participants noted that developing guidelines and filling training gaps is not only critical for preparing Role 1 providers for effective and ethical military medical decision-making but also for addressing death and dying on the battlefield and building moral resilience across the medical corps.

Conclusion:

Our results provide direction for development of ECC clinical guidance and collective team training recommendations. Following these guidelines may increase life-saving capabilities on the far-forward battlefield and equip medical directors and medics to provide ethical and compassionate care to those who cannot be saved in the setting of limited resources and evacuation opportunities.

BACKGROUND

Future large-scale combat operations (LSCOs) with peer or near-peer adversaries in far-forward operational environments may result in recurring mass casualty incidents that are complicated by prolonged casualty care (PCC) situations, when timely evacuation may not be feasible.[1–4] During mass casualty incidents, medics and corpsmen working far-forward as a part of Role 1 medical capabilities may be called to care for greater numbers of casualties with fewer resources, potentially engaging in difficult triage decisions during which they must necessarily determine which casualties to prioritize and in some cases withhold life-saving treatment.[5–8] The demands of LSCO including limited resources, delayed evacuation availability to a higher level of care, redistribution of roles of care locations and staffing, and the potential for a large number of casualties, may require medics and corpsmen to perform expectant casualty care (ECC) in far-forward environments with very limited resources, often only with supplies and medications that can be carried by individual caregivers. For the purposes of this study, we defined ECC as "care

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The views expressed in this material are those of the authors, and do not reflect the official policy or position of the U.S. Government, the DoD, the Uniformed Services University, the U.S. Navy, or the U.S. Air Force.

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doi:https://doi.org/10.1093/milmed/usae389

provided to casualties in a Role 1 setting for whom immediate transfer to a higher level of care is not possible resulting in further resuscitation to be delayed, or withheld, as they are determined to have a poor chance of survival and require significant use of limited or unavailable resources." This type of care may include recognition and communication to team members, a plan for reassessment when feasible, medications and interventions intended to provide comfort and alleviate suffering, and offer basic psychological or spiritual support.

Despite a projected need for increased ECC during future conflicts, no detailed guidelines currently exist for providing Role 1 ECC within military medicine. The lack of clinical guidelines may result in missed opportunities to salvage patients as resources become available, as well as the potential for and suboptimal end-of-life care, which could result in increased patient suffering and the risks of psychological trauma for medics, corpsmen, the platoon/unit/command, and ultimately the patient's family.[9] To guide the development of education and training guidelines and advance team training of both medics and non-medics, an in-depth understanding is first needed regarding caregivers' experiences providing ECC in recent conflicts as well as perceived training gaps. Therefore, this qualitative study explored the experiences of medics and physicians providing ECC and to investigate their perceptions of training needs in this area for future conflicts characterized by LSCO and prolonged casualty care operational settings.

MATERIALS AND METHODS

We conducted an engaged qualitative phenomenological study to explore ECC training needs for future conflicts. This phenomenological approach focuses on actively engaging with a particular community in order to carefully understand their perceptions and experiences and fully comprehend their realities surrounding a complex phenomenon,[10,11] which in this case was expectant care in the deployed setting. Throughout the research process, leveraging our connections with the DoD Joint Trauma System (JTS), our research team engaged as closely as possible with members of the military medical community who were experienced in providing expectant care, as we aimed to learn from our participants' experiences and explore their perceptions of needed ECC training for future conflicts with peer or near-peer adversaries. Also, in engaged qualitative phenomenology, the results generated from the study benefit all members of the community, including the researchers and the participants.[12] The results of our study benefited not only our participants, but also ourselves as members of the military medical community.

To collect our data, we conducted semi-structured, 1-h individual interviews with senior health care professionals (medics and physicians) who had extensive combat and deployment experiences and served primarily in the Role 1 environment (see Appendix Table A1 for participant demographics). The participants were recruited using purposeful sampling in collaboration with the JTS. In fall 2023, the JTS sent out an informal quantitative survey regarding palliative care training needs. The last survey item asked if the participant would like to complete a follow-up formal qualitative interview. We contacted the respondents who stated they wanted to be interviewed to tell them about our study and ask them if they would like to participate. Our research team conducted interviews with these participants. After the interviews, we met and identified redundant themes across all 9 participants. At that point, we agreed that thematic saturation had been reached and no more participant recruitment was needed.[13,14]

The qualitative interviews averaged 45 min and were conducted via phone. We transcribed each interview using an automated transcription service (Scribe). To analyze this interview data, we closely reviewed the interview transcripts and then noted terms, phrases, and concepts within the interview transcripts that we found to be salient to answering the research question.[14] Our team then met to review these codes and grouped and regrouped these codes into categories. These categories served as the themes of this study that illustrated the participants' perceptions and experiences.[10]

We took several steps to enhance the trustworthiness of our data analysis. First, we discussed our biases and the ways in which our past experiences and perspectives may be influencing our interpretation of the data in an effort to bracket these biases.[15] Next, we engaged in member checking by emailing each participant a copy of their transcript, asking them to confirm and add any details they saw necessary.[16] We also leveraged a diverse and experienced research team to analyze our data: 3 military emergency medicine physicians, a military surgeon, a military nurse, and a civilian Ph.D. researcher. This diversity allowed us to examine the data from multiple perspectives as we analyzed our participants' experiences and perceptions.[17,18]

RESULTS

Five themes (see Figure 1) emerged from our data: (1) There is a current gap in ECC training for enlisted Role 1 caregivers throughout the military; (2) ECC training is needed to shift organizational culture; (3) ECC training should be comprehensive; (4) ECC training should be deliberate; and (5) Time is the greatest challenge to implementing ECC training.

Theme 1: There is a Current Gap in ECC Training for Enlisted Caregivers Throughout the Military

The participants described a gap in structured ECC training, emphasizing the current lack of a predetermined or structured approach currently relied on in the field. For example, Participant 3 (P3) stated, "Here's your bag, here's this patient, and you're keeping them alive on very basic skills and basic knowledge. And if you take any one of those things away, the patient expires … they don't have that decision-making

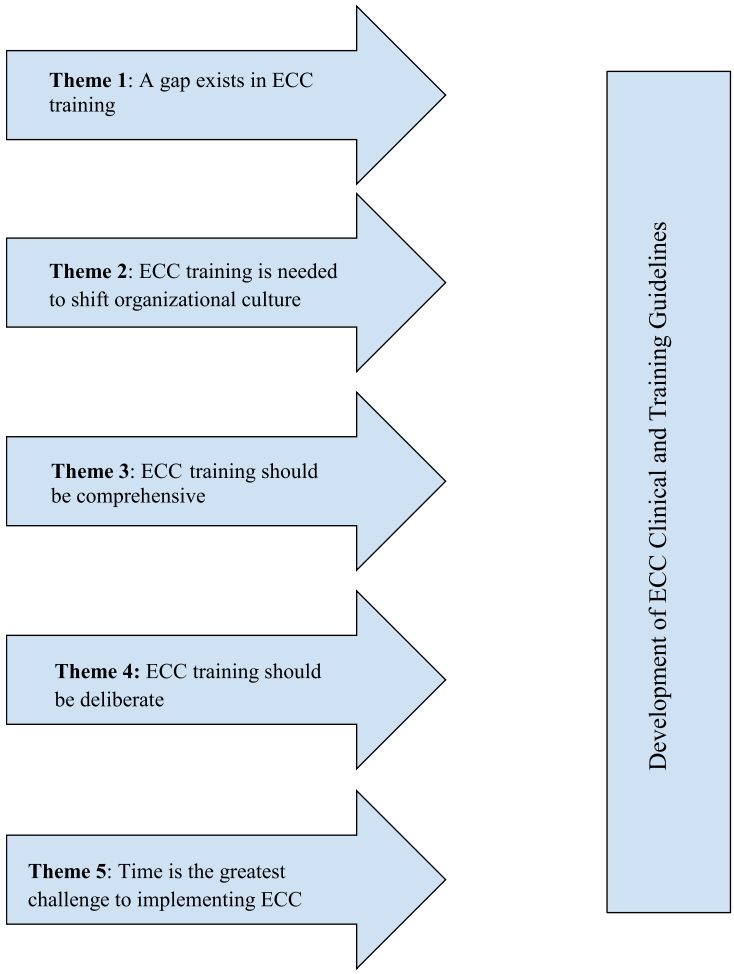

Figure 1. Study results and implications.

matrix" (P3). Participant 1 echoed the lack of pre-deployment training for medics, instead relying on

> hip pocket training into your unit's medical … You have these medics that are sitting on gate guard or doing jump coverage or doing whatever, and then, oh, that unit's deploying, and now you're expecting them to give good quality medical treatment under a CPG that they might not have ever seen.

In addition to the medics, the physicians in the study expressed feelings of unpreparedness. Participant 5, for example, described how early on in their career they "certainly didn't feel prepared as a freshly-minted resident graduate of the Army."

The participants also described how this lack of a structured approach to providing ECC can result in psychological consequences. "Part of the reason where I went down in the dumps for years afterwards is because up until that point, if your patient died, you failed. Like that was the, that was the thing, right? Like there were no scenarios for expectant care." (P9) Participant 6 likewise described the trauma of not knowing what to do after someone had died.

> This has not been something we had rehearsed. You don't really rehearse for failure. Okay, now we have a dead guy. We failed to treat, we didn't save his life. What do you do with his body? So there actually was some argument between us and the aid station, the 18 Deltas who came from their camp, what do we do with his body? How do you treat it? (P6)

Theme 2: ECC Training is Needed to Shift Organizational Culture

The participants in our study provided insight into ways to fill this ECC training gap. They first emphasized the need to change the mindset of caring for mass casualties during LSCO rather than 1 or 2 casualties. Participant 4, for example, described the need to predetermine "how much of our resources, how much of our limited medical equipment set are we going to burn on this one casualty?" (P4). Another participant described their shift in mindset about death.

> Not everybody's going to live … giving realistic expectations, especially if you start getting on a larger peer near peer

> type conflict, it's going to be something that we've really not experienced in modern era. (P8)

Along with these expectations comes a training need to embrace a culture of open discussion, including views on death and dying, in which death is not seen as failure. Participant 9 described how "as a society, we have gotten used to saving pretty much everyone." As a result, medics may believe "the patient still died, I still failed." In order to reverse this mindset, "you'll have to convince a lot of instructors that the patient dying doesn't mean the medic failed and teaching him that it's setting him up for failure" (P7).

Theme 3: ECC Training Should Be Comprehensive

In addition to using training to change the mindset towards providing ECC, the participants also described how ECC training should involve both medical and non-medical stakeholders and cover such topics as host nation cultural norms around death and dying. First, they noted that training needs to be conducted "at the unit level, not big brush strokes, sit 80 corpsmen in a classroom and talk about that because that's not going to focus on the environment and the operation." (P3) The participants noted that this ECC training should involve leadership as well.

> The commanders also need to know that the medics need this training and they need to understand what that actually looks like. Not just, 'Hey, more people are going to die.'
> Okay, check. Got it. But actually, go through everything that it takes to now handle one of these patients. (P6)

Next, the participants described how ECC training should also involve host nation casualties, due to the many cultural and political factors involved in providing ECC care. Participant 9 described how training should include "host nation military casualties and the procedures to carry once a casualty has died needs to be part of the training (allied, U.S. and HN). For example, after putting the patient in a body bag, put their nation's flag over the box/bag/coffin, moment of silence, etc. Train the process of honoring the casualties' sacrifice" (P9). Participant 8 likewise echoed the "ethical and social constraints" of caring for host nation casualties. "Like in Abu Ghraib where providers, we were the highest-level detainee care in the country, and so patients who would need … [end stage] dialysis and things like that, that just would not be kind of given to the host nation and we're not going to evacuate them out of the country for that." These cultural factors are important in the aftermath of death. "There's a little bit of deburdening that happens with that, too. Like, "Hey, this wasn't just my decision that there is probably a higher power at work in all of this" (P5).

Theme 4: ECC Training Should Be Deliberate

In addition to needing to be comprehensive, the participants in our study also described how ECC training should be deliberate, including guidelines, a focus on ethics, experiential training, and intentional post-mission debriefing. They first noted how guidelines are needed to help with difficult decision-making processes in order to alleviate medics from taking responsibility for the patient's death and provide direction in high-stress, high emotional situations. Participant 7 explained how "If I follow these steps during the highest level of stress, when it's the hardest time to make a decision … I have more bandwidth and more brain power" (P7). Participant 4 likewise elaborated on the benefit of written guidelines for providing ECC.

> Medics need to be told it's okay. It's okay to not try to aggressively save a life that you know in your heart can't be saved. And so, I think that some written guidelines would help them to wrap their mind around that … Okay … I'm not completely out on my own. I'm not going to get reamed by my battalion surgeon for doing this. (P4)

These ECC guidelines may alleviate future moral injury, as they take away some of the emotional burden associated with the decision-making responsibility from the health care professional.

> I think about even future shipboard ones where this guy's burnt, like 80% burned, and it's going to take a lot of fluids to get him taken care of … this guy who's in writhing pain, you don't have near enough fluid to keep washing out his kidneys and he's going to end up dying anyway. So, they need to have a decision matrix. (P3)

The participants also discussed how deliberate training should include medical ethics, including case-based scenarios to discuss and work through.

> A class on medical ethics … scenario-based discussion that they need to have with sailors or medics … to know that here's scenarios, but you can't just look at the patient, you have to look at the whole spectrum of operations, tactical environments, resource management. (P3)

Participant 7 echoed the importance of teaching medical ethics using scenario-based discussion.

> I always create a scenario with a patient who dies. And I've had other medics argue vehemently against that and saying, "No, we're just teaching them failure." And I'm like,
> "No, we're not. This is normal." It is a normal part that you're not going to save everybody on the battlefield. (P7)

Coupled with these guidelines and case-based ethics training, the participants noted the benefits of experiential training, so trainees can work deliberately through the processes and experience of providing ECC. Participant 1 described how training should include "sight, sound, smell, sensation, everything is as real as possible, because then it's not going to be as much of a psychological impact as it would have been had

they never experienced anything before" (P1). Participate 5 agreed that training should "introduce those scenarios with either live action role player patients, simulated patients and put the medic or the corpsman in that position where they realize the futility of their actions and then they understand that during the debrief that it's okay." Participant 5 likewise confirmed that trainees "need to be exposed to death and dying at some point in their training pipelines. They have to have an 'unsuccessful outcome' in their patient care and work through that" (P5).

Finally, the participants described the need to intentionally address ECC during the post-mission debriefing process in a constructive, non-accusatory way. "You need to tell them, 'Hey, here are all the other things that were going on. You made this decision, let's talk about why you made that decision.' And it really does take some time to talk through that stuff … and it's super powerful when I've seen it" (P6).

Theme 5: Time is the Greatest Challenge to Implementing ECC Training

The participants all agreed that time was the biggest challenge to providing ECC training. Participant 1 summed up their sentiments: "Everything is priority, therefore nothing is priority" (P1). Participant 6 echoed that

> You only have, let's say I get six hours with these guys, like how many of these hours am I going to teach people how to let somebody die with honor as opposed to how I could best treat somebody? So those are like real decisions you have to make as an instructor and as a content developer or a training developer, at what point do you put that in there? (P6)

Finally, Participant 4 described the need to advocate for a better understanding of medics' role in providing ECC in order to increase the potential for training time.

> You only have so much time to provide education and training for the medics, and it's just not a high priority … We have this idea that medics just take people to the hospital and you do the things that you need to do to get them to the hospital, but that's about it … I think that helping medics to understand their broader role within the healthcare system of these casualties that, yeah, they can make those decisions. (P4)

DISCUSSION

Our study yielded 5 themes with important implications for military medicine: (1) There is a current gap in ECC training for enlisted Role 1 caregivers throughout the military; (2) ECC training is needed to shift organizational culture; (3) ECC training should be comprehensive; (4) ECC training should be deliberate; and (5) Time is the greatest challenge to implementing ECC training.

Our results hold important implications for fulfilling the military's medical mission. The primary mission of Military Medicine is to support the warfighter in defense of the nation.[19] Trust that their unit's medics, corpsman, and medical teams have the knowledge, training, and resources to save lives, should severe injury or illness occur, allows tactical commanders and warfighters to successfully execute the tactical mission.[20] Looking ahead to the unique logistical challenges associated with LSCO, it is imperative military medicine maintains this trust and prepares medical teams for making complex medical decisions related to triage, resource allocation and death and dying in the context of ECC.[7] Developing education and training programs centered around exploring and discussing these logistical challenges and applying them to LSCO or irregular warfare (IW) training scenarios and simulations is critical for preparing Role 1 providers for effective and ethical military medical decision-making, but also begins the process of addressing death and dying on the battlefield and building moral resilience across the medical corps. Our study's results can help inform the development of these training initiatives, guide the development of ECC clinical guidance, shape policy and procedures, and provide a framework to support candid discussions among medics/corpsmen, medical directors, medical planners, and line commanders.

Structured guidelines may likewise help Role 1 medical directors develop informed policies and procedures for unit medics and corpsmen to prepare them for difficult triage decisions during mass casualty and prolonged casualty care situations. Such guidelines may also provide a framework for medical direction by unit medical officers, and can drive necessary conversation between medics and licensed providers who may be providing remote supervision for ECC. Identifying the required knowledge, skills, and abilities for Role 1 providers in future LSCO and IW environments will inform the development of quality education and training tools. Ensuring education and training to key objectives can promote effective medical decision making while decreasing the cognitive load and emotional burden in challenging situations with limited resources while deployed. Recognition of the unique operational priorities of combat casualty care and the stark differences compared to published in-hospital guidelines and practice is paramount to informing future training needs.

Lastly, determining how to maximize limited education and training time to ensure quality and reproducible results is a common gap in combat casualty care training.[21,22] To help fill this gap, ECC principles must be introduced in initial medic/corpsman training and reinforced iteratively throughout their careers as forward deployed Role 1 caregivers. Areas that deserve focus during the development of ECC curricula include new topics, such as an introduction to bioethical principals, managing simulated patients that do not survive, and how to conduct effective and constructive post-mission ECC debriefs in these situations. Teaching medics and corpsmen how to perform a constructive ECC post-mission debrief is perhaps the most important training element to change the culture and perceptions of ECC, as this process enhances critical thinking skills and clinical decision making while simultaneously minimizing the potential negative psychological impact

that can be associated with end-of-life care on the battlefield.[23,24] Finally, another essential training tool can include providing a series of ethical case studies based on real-life events for units/commands to review before and during deployment. These case studies can facilitate a culture of open discussion about how to handle decision making and normalize feelings of grief surrounding death and dying.[25,26] Future research could explore the best modality for delivering this type of training: i.e., in-person training vs. online training vs. augmented or virtual reality training.

Limitations

The participants in our study had deployed mainly to Iraq, Afghanistan, and Africa. Their perspectives are limited to counter-insurgency operations and IW, rather than the LSCO anticipated for the next conflict. Similarly, the participants were drawn from the special operations community as those who were most likely to have had the most experience in kinetic, limited resource settings where such medical decision making may have been required. While this high level of exposure may have introduced bias to our results, our participants possessed a higher level of training and more operational experience than the average Role 1 provider. The authors believe this gap highlights the existence of an even greater education and training need for conventional medics, corpsmen, and their supervisors. Ultimately, to further optimize training and curriculum development, future research should explore the nature of LSCO and how providing ECC during LSCO may differ from providing ECC during past conflicts.

CONCLUSION

Our results provide direction for development of ECC clinical guidance and collective team training recommendations. Providing these guidelines may increase life-saving capabilities during LSCO and equip medical directors and medics to provide ethical and compassionate care to those who cannot be saved in the setting of limited resources and evacuation opportunities.

ACKNOWLEDGMENTS

None declared.

CLINICAL TRIAL REGISTRATION

Not applicable.

INSTITUTIONAL REVIEW BOARD (HUMAN SUBJECTS)

This study was reviewed by the Institutional Review Board at the Uniformed Services University (DBS.2023.608).

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

Not applicable.

INDIVIDUAL AUTHOR CONTRIBUTION STATEMENT

R.C., S.K., and S.R. designed this research. R.C., S.K., S.R., M.D.T., S.G., and M.G. analyzed the data. R.C. and S.K. drafted the original manuscript. R.C., S.K., S.R., M.D.T., S.G., and M.G. reviewed and edited the manuscript. All authors read and approved the final manuscript.

INSTITUTIONAL CLEARANCE

Institutional clearance approved.

FUNDING

None declared.

CONFLICT OF INTEREST STATEMENT

None declared.

DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author. All data are freely accessible.

Appendix Table A1. Participant Demographics

Category	Number of participants
Age (years)	
45+	3
35–39	6
Branch of service	
Army	8
Navy	1
Air force	0
Status	
Active duty	5
Reservist	1
Retired	3
Years of service	
>20	4
16–20	5
Highest level of medical training	
Nurse	1
Special Operations Medic	6
Physician	2
Supervisory experience	
Medical Director	2
Senior Non-Commissioned Officer	7
Number of combat deployments	
>5	9

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Military Medicine, 00, 0/0:1, 2024, doi:https://doi.org/10.1093/milmed/usae389, Feature Article and Original Research