Title Train for the Game: What is the Learning Environment of Deployed Navy Emergency Medicine Physicians?

Running Title Learning Environment of Deployed Physicians

Author names

*Nicole D. Hurst, MD[1], Steven J. Durning, MD, PhD[1], Ronald M. Cervero, PhD[1], Daphne Morrison Ponce, MD[2]

[1] Uniformed Services University of the Health Sciences, Bethesda, MD

[2] University of Michigan Health System, Department of Emergency Medicine, Ann Arbor, MI

*indicates corresponding author

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DR. NICOLE D HURST (Orcid ID : 0000-0002-0793-7467)
DR. DAPHNE MORRISON PONCE (Orcid ID : 0000-0002-6191-643X)

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Corresponding author mail id: nikkidhurst@gmail.com

Background Medicine is a practice characterized by ongoing learning, and unique qualities of the operational learning environment (LE) may affect learner needs. When physicians move between differing practice environments learners may encounter situations for which they are unprepared. Using a conceptual framework specific to the LE we therefore asked the following research question: what is the difference in LE for Navy Emergency Medicine (EM) physicians who practice in US hospitals but serve an operational environment, and how do these differences shape their learning needs? **Methods** We interviewed Navy EM physicians who recently deployed to explore their perceptions of the deployed LE, how it differed from the LE they practice in stateside, and the perceived effect this difference had on their learning needs. We used the constant comparative method to gather and analyze data until thematic saturation was achieved. **Results** We interviewed 12 physicians and identified six interconnected themes consistent with the LE framework in the literature: 1) Patient care is central to the learning experience 2) Professional isolation vs. connectedness 3) A sense of meaningful practice engages the learner in the LE 4) Physicians as educators shape the LE 5) Team trust impacts the LE 6) The larger military organization impacts the LE. **Conclusions** Our themes span the conceptual framework put forth by Gruppen et al. and did not find themes outside this framework. These interconnected themes describe the difference in LE between the stateside and deployed setting and impact the learning needs of Navy Emergency Medicine physicians. These results inform strategies to position the deployed medical unit for success.

Introduction

Lifelong learning is ongoing and necessary for the successful practice of emergency medicine.[1] It is well understood that the learning environment (LE) impacts learning.[2-4] The LE can be defined as “the social interactions, organizational culture and structures, and physical

and virtual spaces that surround and shape the learners' experiences, perceptions and learning."[5]

Navy Emergency Medicine (EM) physicians practice in a stateside LE and deploy to the operational military setting, which would be expected to represent a unique LE.[6, 7] When physicians enter a different LE they may encounter situations for which they feel unprepared. These differences can also impact a physician's ability to learn and practice effectively.

The challenge of moving between LEs is likely common to health professions education. This phenomenon is highlighted by the ongoing COVID-19 pandemic which demonstrates how this new learning environment has created many opportunities for physician learning.[8]

In military medicine, multiple training programs exist in an attempt to prepare for the unique challenges encountered in the operational environment.[9-20] Despite these efforts to prepare deploying physicians there are continued concerns about practicing in a deployed environment, and examples of resulting adverse patient outcomes exist in the literature.[10] Herein lies an opportunity for improved educational content or methods to facilitate transition of practice.

Gruppen et al. described a framework to conceptualize the LE in health professions based on personal, social, organizational dimensions and physical/virtual spaces (Figure 1).[5] This framework was based on a literature review, proposed that these four elements likely interact, and that the framework should be tested empirically. We used this framework to guide our qualitative study which provided a lens to examine how the LE differs in the deployed vs. stateside settings. More specifically the deployed setting is a different physical space than the stateside setting that likely also impacts the three other elements which we sought to explore.

The goal of our study was to understand the differences in the LE experienced by Navy EM physicians who recently transitioned from a stateside practice environment to a deployed practice environment. We evaluated the psychosocial dimension (personal, social, and organizational) and the material dimension (physical and virtual spaces) of the operational setting and compared it to the training environment.[5] Our specific research question was, what are the differences in the learning environment for Navy Emergency Medicine physicians who train in US hospitals but practice in an operational environment, and how do these differences shape their learning needs.

Methods

Interview guide

We developed our interview guide based on the existing learning environment framework literature providing content and construct validity evidence. [5] The interview guide was then piloted with three physicians whose experiences were outside of our study period providing face validity evidence. Our initial interview guide consisted of open-ended questions that addressed the psychosocial dimension and the material dimension of the different clinical settings. [Appendix 1]

Recruitment and consent

We recruited Navy EM physicians who had deployed in a military capacity as an EM physician with the first day in the country of deployment on or after Jan 1, 2017. Study subjects were required to have completed at least 90 days of a deployment scheduled to be at least 180 days long. All study subjects were interviewed within 2 years of return from deployment. Navy EM physicians were recruited by specialty-wide email and individual references. We used rolling recruitment and stopped enrollment after saturation was met. We screened 42 physicians. Twelve were interviewed for the study, 18 did not meet inclusion criteria and the remaining 12 physician interviews were not conducted as the study had concluded. Phone interviews were conducted from January to March, 2020. The Institutional Review Boards at the Uniformed Services University of the Health Sciences and University of Michigan approved this study.

Data collection

Subjects completed demographics, deployment characteristics, contact information, consent and confirmation of the inclusion criteria via online form. Two Navy Emergency Medicine physicians with deployment experience and additional training in health professions education conducted all phone interviews. The interviews lasted from 60-90 minutes.

Data analysis

All interviews were transcribed verbatim and audio recorded. Together, two coinvestigators (NH, DMP), conducted each interview. We used the constant-comparative method to identify themes. Our four person team included two professors of health professions education with extensive qualitative methods experience and the two interviewers mentioned above. The 2 EM interviewing physicians analyzed the data independently, and then the group met periodically to

analyze the data together. As themes were identified, the coinvestigators participated in an iterative process to identify themes and subthemes. The research team met on a weekly basis to discuss themes, build consensus and review the interview guide.[21] The group explored potential themes in depth until unanimous consensus was reached. Differing opinions were explored through discussion. There were no disagreements that could not be resolved. We continued this process for three interviews past the point where no further unique themes were identified, determining that thematic saturation had been reached. [22]

Results

We interviewed 12 Navy Emergency Medicine physicians. Individual's rank ranged from Lieutenant (O-3) to Commander (O-5). Subjects had a range of prior deployment experiences and backgrounds (Table 1).

Six themes that pertain to the LE were identified: 1) Patient care is central to the learning experience 2) Professional isolation vs. connectedness 3) A sense of meaningful practice engages the learner in the learning environment 4) Physicians as educators shape the LE 5) Team trust impacts the LE 6) The larger military organization impacts the LE.

Patient Care is Central to the Learning Experience (Patient is Central)

Some patients were different in the operational setting. A portion of the care provided was typical of emergency presentations in the stateside environment, however study subjects described seeing more primary care visits and increased trauma severity. Additionally, infectious pathogens, environmental exposures and antibiotic resistance differed based on deployment location.

> *"This was different from the US...patients would get prehospital meds and could be altered. Everyone gets pan scanned. More liberal with antibiotics, assume everything is contaminated and resistant organisms. More blood transfusions."*

Uniformly, all respondents reported lower patient volumes and less time focused on patient care in the operational LE. Participants stated that low patient volumes impacted their learner needs. For example, without delivering continued patient care, physicians expressed concern about skill decay that would impact their ability to care for patients in the operational setting and upon

return to the United States. They stated that their engagement in the clinical LE was driven by exposure to patients.

> *"Despite bringing books out here…without having that person in front of me to look at and bring the knowledge all together I am deteriorating…I need the hands on, I need the patient in front of me to really tie it together."*

Generally, providers felt a connection with active duty patients; the shared deployment experience engaged physician learning at an emotional level.

> *"Taking care of injured Americans was harder emotionally...there was just something about having [the patient] talk to you...I felt more connected. I'm active duty and they're active duty."*

In contrast, language and cultural barriers were a barrier to learning; some physicians reported difficulty connecting with patients when a translator was necessary.

> *"They're [Americans] actually speaking to us and we're speaking to them and having a conversation. Versus the Afghans you're looking to this third party to do the communicating for you…you could still develop a [patient-physician relationship]. The language barrier automatically makes you less connected."*

These differences in LE challenged physicians and inspired active learning. Physicians reported learning from subject matter experts, like those with primary care, field medicine or operational experience.

> *"It had been like two years since I had done trauma...On the way out there I was terrified, so I was reading the clinical practice guidelines non-stop...Right when we got there, our team got briefed by the outgoing team, thank goodness, on how that facility accepts traumas and the process that they had identified to try and get them through as quickly as possible. And they showed us, it was like a "crawl walk run" kind of thing. And fortunately, we did that with them because within 72 hours we had that rollover vehicle guy and then 12 hours after that we had a mascal. Because we drilled with them and then did this actual scenario then I felt like I had my feet wet, so I was good to go."*

Physicians adapted in various ways (Table 2). Specifically, to low patient volumes, they worked to maximize learning opportunities from each patient encounter. They were able to learn from longitudinal exposure not available stateside.

> *"Ask more questions and take more time to go over patient encounters...I actually took more time with my patients than I would here because I didn't feel rushed. I didn't really have any more patients to have to move through unless we were in a mascal situation...I would stop over in the ortho clinic and some of the people we had seen previously for mascals would be following up...I'd see how they were doing and touch base with the ICU."*

Professional isolation vs. connectedness (Isolation)

Physicians who previously trained or worked in large hospitals typically experienced a sense of professional isolation due to a limited number of physician colleagues, whereas physicians from smaller hospitals often expressed having increased connectivity. In stateside emergency departments, physicians step onto a team with different team members each shift. In the deployed setting, team members usually remained the same, so physicians developed a strong sense of connection with their teams.

> *"[At home] I can go an entire shift and not talk to [another doctor]…I could go weeks without talking to any other doctors in the hospital...On deployment I was with the same group of doctors every third day and so not just me but I'd have an intensivist, a trauma surgeon, same anesthesia team, same nurses…we a had really great relationship."*

Similarly, the consultants available were typically the same person for the entire deployment, thus exposure to fewer perspectives led to decreased learning opportunities.

> *"There's only so many times that my orthopedic surgeon can teach me how to put on a splint…There's only so much stuff that you can teach me without being able to expand any further on it, since your opinions on the matter are always the same."*

Professional isolation and limited resources typically experienced in the deployed setting can result in a different standard of care. For those who had practiced in a resource-limited environment, this was an easier transition. For those who had only practiced in large, resource rich academic centers, learning to adopt a different standard of care was more difficult.

> *"Your idea of what good medicine is, is based on being at an academic facility and having access to every single thing."*

Additionally, this professional isolation challenged providers to practice medicine in new ways. For example, delayed patient transport challenged them to manage conditions in the ED for longer periods of time, rather than admit the patient for continued care.

> *"I had a sick contractor, STEMI, cardiogenic shock who was in the department for 24 hours. I never had this problem back home. I had a renal failure patient in the ED for upwards of 24 hours. Typically, I had never managed these conditions on my own for that long."*

Participants reported that there was a greater proportion of male than female patients in the operational setting. Some female physicians reported that some patients from different cultures did not recognize them as physicians. This impacted the way they learned from their patients.

> *"A lot of them were very adamant that we not look at their genitalia. They got very upset when you were trying to expose them in the trauma bay. They [would say] 'no…my fiancé is the only person who's allowed to look there'."*

For some, professional isolation was tied to personal isolation. We noticed that female gender, racial minorities, lower rank, those with no prior deployment experience and those with less military experience were more likely to experience isolation. Intersectionality of these groups increased the likelihood of isolation.

> *"I think at that point the learning had ended...I did go into a very emotional, very dark place, and I was just surviving at that point. I really isolated myself, I stayed away from people, I stopped going to as many meals as I could...I didn't want to be around anyone."*

Physicians attempted to adapt to the professionally isolated LE in many ways (Table 2). Commonly they laid out individual study plans, but these almost uniformly failed. Self-motivation was difficult without regular patient contact or interactions with peers. Intermittent patient interactions spurred individual self-study efforts resulting in a yo-yo effect.

> *"[Motivation to learn] is like a waxing and waning thing...when I got out here, I felt super motivated. I'm going to get all these CMEs. I was going to read Rosen's front to back, twice. I'm going to go through Roberts and Hedges. I brought all of this out here. Because I knew that I'm not going to see things, but I'm going to make sure my mind is there. It worked out really well for the first few weeks. Then I fell into this pit of why am I reading all this stuff when I can't utilize it."*

Some physicians described innovative ways they successfully adapted to the LE by learning in groups. This was locally with other deployers, as well as globally within their network.

> *"...at night I'd read some of my own CTs and then the next morning I'd go review them [with the Radiologist] and discuss my thought process…"*

A sense of meaningful practice engages the learner in the LE (Meaning)

Finding meaning in one's daily work can encourage engagement in the LE by bringing a sense of professional satisfaction. Physicians who were actively seeing patients reported having a tangible understanding of the mission. Physicians with few patient interactions sometimes searched for meaning in their daily work.

> *"We were saving people who were over here prepared to give their lives for other people, it was a different feeling, it was a feeling of pride."*

> *"A lot of times you just felt like you didn't know why you were there."*

Physicians reported that a sense of cooperation seemed to dominate while taking care of combat injured patients.

"I personally felt very connected with my team when we were resuscitating the critically ill patients that we did have...Everybody was on the same page and the results of that were phenomenally rewarding for everybody...Corpsmen were just as important as the physician and everybody had something to offer and the patients benefited and then at the end we'd have a really nice debrief and it would make our team cohesion soar."

Those involved in contingency planning knew their work was important, but found it difficult to remain enthusiastic about planning for events that might never occur. They reported struggling to remain actively engaged in the LE, reporting that enthusiasm often waned for engaging in simulation drills or self-study plans. They longed for the immediate professional reward associated with seeing patients.

"We have a mission, but our mission is only if something happens."

Physicians who filled leadership positions found meaning in communicating a broader sense of mission to the medical unit. They found purpose in ensuring the medical unit was prepared to support the warfighting effort. Those in leadership positions worked to create an environment of open communication and awareness about how medical care impacts unit readiness. This brought meaning to work activities and engaged learners of varying seniority.

A sense of meaningful practice and mission engages the learner in the learning environment. This theme was highly interactive with the centrality of the patient, because patient care is closely tied to a sense of purpose. When this tangible aspect was missing, it was harder to recall the mission and engage in the LE.

Physicians as Educators shape the LE (Educator)

In the deployed setting, physicians assume the additional responsibility of ensuring the readiness of their care team. Physicians reported that they were challenged to lead educational efforts for corpsmen and nurses with a wide range of prior experience, skill sets and medical knowledge. Many members of the care team had minimal experience in their deployed role. Stateside, the education and training of corpsmen and nurses is not a primary physician responsibility, but it is in the deployed setting.

"They [corpsman or nurse] discussed thoracotomy. I reviewed that CPG and then went over the equipment in our set."

This additional role as educator required physicians to develop medical education skills and shape the LE for individuals in different roles. Many physicians found that being an educator was a meaningful part of their job, as they taught basic nursing skills, developed simulation cases, and ran mass casualty drills. Most physicians established a LE in which all members of the care team participated in daily group education events and teaching that was unique to the deployed setting. They empowered subject matter experts from all professional backgrounds to teach within their domain.

"None of our corpsmen and none of our nurses actually had any trauma experience. Our ED nurse didn't have any ER experience…We reviewed CPGs lecture style. We did trauma drills...It was usually me or the other ER doctor giving the lectures."

Turnover was typically planned by the off going team, and varied widely in duration and quality. Physicians considered the most valuable parts of turnover to be MASCAL exercises and observing the prior team functioning. Jetlag presented a challenge to effective turnover.

Team trust impacts the LE (Trust)

Physicians must work to understand the unique attributes of the deployed clinical environment, establish roles and foster an environment that promotes trust and healthy conflict. While this challenge also exists in stateside clinical settings, the unique clinical environment and the consistency of team members requires that conflict be actively managed.

"You feel like you become a family and you're just stepping on each other's toes...the other doctor would write an order and then I'd hear the nurses complaining about it in front of the corpsmen...little grumblings."

Team members' brought expectations from prior experiences, and physicians worked to understand and integrate with physicians with different backgrounds and expectations.

> *"The cultures from other specialties are all different; it's like we're all in our own gang. The cultures of other specialties are completely different from emergency physicians. We're used to rolling with a resource limited posture. Anesthesiologists are completely different. They don't intubate unless everything is perfect. If it's not perfect, they cancel the case."*

This ambiguity also exists in defining who runs codes, as many different specialties have experience in this realm. This forces the team to explicitly define roles, build trust and manage conflict to effectively function in this unique setting.

> "*The casualty receiving area of a role 2 unit, is that an OR? Is that an ER? Is it an ICU? Nobody really knows…It's different."*

Stateside, team roles are well defined and each day the EM physician joins a team with new members, each filling a predetermined role on the team. Teams function differently on deployment, in part because the team members tend to stay the same and fill flexible roles established by the team.

> *"We had it [team roles] ironed out ahead of time, the team that I was on was going to take bed 1...overflow would go to pulmonary/critical care, our ICU doctor...or the ghost team…or the PA from primary one was going to come over and help...once we got beyond beds one two and three there was not so much clarity about who was going to be running the bed…"*

Prior to deployment, team members typically do not know one another. To establish new roles, team members needed to build trust. Physicians often described an initial period of competition leading to conflict. Often, there was an event that allowed the team to build trust in each other and work through conflict with a positive outcome.

> *"We had a code...I was running the code and the CRNAs jumped in and they started barking med orders at the nurse that was assigned to do medicine…I had to say*

everybody stop, med orders are going to come from me...Afterward we huddled up about it and I said this could have been a lot better...at first they took offense, but then by the end of the conversation we were much more on the same page…this is what I think I could have done better, this is what you could have done better, do you agree or disagree, and if you disagree let's have that conversation...Effective teams you have to be able to criticize each other vocally...[but you] have to press each other and encourage each other...I'm not perfect, you're not perfect if we disagree let's hash it out."

Others describe continued unresolved conflict and persistent lack of trust. Unresolved conflict also contributed to the theme of isolation.

"*My job as the emergency medicine physician was to wait outside of the tent at the casualty collection point and just triage patients…I didn't understand why no one understood that I had more skills than just to be able to say this patient is sick or this patient is not sick or this patient is dead. So instead of me wanting to be cooperative, helping, I wasn't."*

"I hated going to work so I wouldn't...I would go hang out in sick call...I would go to the BAS and there were times I would just roll my ultrasound around and find some random Marine that wanted something ultrasounded."

The larger military organization impacts the LE (Larger Military Organization)

In the deployed setting, physicians describe heightened awareness of the interaction between the larger military organization and their clinical practice. All naval officers have a dual role as military officers and clinicians, however the balance of these dual oaths can be more palpable in the deployed environment.

Traditionally, sailors are taught "Ship, shipmate, self" to describe priorities. The Hippocratic Oath requires that physicians prioritize the needs of their patient. In the deployed setting, physicians must make clinical decisions with a new balance of priorities. They learn a new set of operational considerations, as they make patient care decisions. Physicians reported that at times this led to internal conflict.

"*situations where you were required to do things the "military way" and not the "medical way"...I'm supposed to be a naval officer first and a physician second."*

Resources available through the larger military organization's supply chain impacted the LE. The limited availability of tests, equipment, medical evacuation capabilities and personnel challenged physicians to adapt. For example, stateside patient transfer systems are well established.

"*The [modus operandi at the] MTF (military treatment facility) is stabilize and call the transfer center and they pretty much take care of everything for you"*

In the deployed setting medevac capabilities required constant physician attention and a balance of multiple external factors impacting transfer.

"I'm going to my CO and explaining to them they need medivac...it became a logistical burden to explain why...a lot more coordination. You are the transfer center and the doctor"

Physicians learned a new role in maintaining supplies in the deployed setting. They learned to navigate intricate supply chains and consider delivery times, expiration dates, and consumption rates.

"the blue top tube expired in 9 months and it took 6 months to get stuff…the tubes often arrived expired"

Participants also reported that international clearance for medical supplies was a new consideration as well as equipment compatibility.

With increased exposure to the specific nuances of the operational setting, physicians functioned more easily. Physicians with deployment experience were able to adapt faster; similarly, those with mentors who had deployment experience were able to learn and adapt faster.

"*The fact that I had deployed before allowed me to move past that [low patient volumes] more quickly".*

Discussion

We sought to explore the differences in the LE for Navy Emergency Medicine physicians who practice in US hospitals but deploy to an operational environment, and how these differences can shape their learning needs. This study identified six interactive themes rooted in the conceptual framework described by Gruppen et al. Thus, our research provides preliminary validity support for their proposed structure, as we found themes in each component and did not identify any themes that could not be hung on this. Our themes spanned the dimensions of the model and interacted in many ways. As an example, we will discuss how the patient care theme interacts with the other themes to either positively or negatively shape the LE.

We will discuss how a meaningful patient interaction creates a positive impact on the LE, through the lens of the themes identified. Patient interactions decreased isolation by increasing interactions with consultants and peers. Since all of our study subjects were active duty military, taking care of military patients led to a sense of meaningful practice by tangibly contributing to the common mission. As physicians molded the team, these patient interactions also provided opportunities for teaching. Team trust usually improved as members came together to care for a critically ill patient. Finally, the support of the larger military organization enabled physicians to stay engaged in patient care. This example shows how a single theme interacted with the other themes to positively shape the learning environment.

In contrast, themes also interacted to negatively impact the LE such as when a physician deployed without seeing any patients. Without patients to engage the physician professionally, there was less opportunity for patient centered learning, resulting in more isolation. Similarly, when the mission was to care for combat casualties but none existed, physicians lacked a sense of purpose. Physicians felt limited in their ability to create engaging learning opportunities without patients. Without patients to care for, teams struggled to work through conflict and establish trust. Finally, if the organizational leadership routinely utilized the medical compound as a contingency plan, this decreased the number of patients in the LE. This example shows how themes interacted to negatively impact the LE. Themes interacted in numerous ways with other themes as illustrated in Figure 2.

In fact, the Patient is Central is a theme that was truly central to the other themes. Prior work has found that the centrality of the patient also dominates stateside LEs.[2-4] We postulate that this theme would likely be foundational in other austere LEs such as geographically or socially isolated practice settings. The primacy of this theme suggests that it should be a central focus during curriculum development.

We were encouraged that learners adapted to meet the challenges of this new environment (Table 2). With these results in mind, we suggest proactive LE strategies to target specific learner needs. Physicians and organizations should constantly seek opportunities to increase exposure to a wide variety of patient encounters either in person or by using simulation or virtual exposure. When these opportunities arise one can maximize learning by, for example, engaging teams or providing longitudinal exposure. Encourage opportunities for physicians to connect personally and professionally and watch for signs of isolation. Look for ways to understand the contribution the medical unit makes to the larger military mission, and understand that physicians may struggle with a sense of purpose and meaning. Engage physicians as educators and supply them with educational strategies and resources for the deployed setting. Seek to understand the background perspective of team members as roles and responsibilities are established and use conflict as a tool for growth and to establish trust. Engage mentors and leadership to support a positive LE in the deployed setting.

Our study was limited by deployments during the study period having low patient volumes, thus these results may not apply to deployments with higher volumes. We suspect that the theme of centrality of patient care to the learning experience would be unlikely to change, however it would likely interact with the other themes differently. Second, while we had a small sample size of study subjects, we reached saturation after 12 interviews following an established conceptual framework which suggests that our results would apply to a larger volume of participants. Third, these participants did not include physicians from other services or those deployed to Navy and Marine Corps Role 1 (immediate first aid care) and Special Operations settings and it is unknown if these results apply to different deployment experiences. Finally, we specifically excluded humanitarian and disaster response deployments, thus it is unclear how these themes may apply.

These six themes aligned within the Gruppen framework, and we believe they can be used to inform strategies to successfully transition the navy physician into the deployed LE. For residencies, this information could be used to inform development of military unique curriculum (MUC). While these results are specific to Navy EM, as all Navy specialties work to develop their unique MUC, these themes could inform curriculum for other specialties deployed to this learning environment. This work could also help shape pre-deployment training curricula not only for physicians, but also for nursing and corpsmen communities. Finally, physician learning is ongoing during deployment, thus these results inform ways to continue professional growth by both the individuals and the organization.

Better understanding of the LE has implications for all health professions. The nature of our job requires flexibility in our training pipeline and in job transitions. As we have seen with the current COVID epidemic, this has required entire hospital systems to enter new LEs simultaneously with no warning. Some physicians are being challenged with reduced access to patient interactions, as patient censuses have dropped in some areas. The physical barriers of personal protective equipment leave many physicians with a feeling of isolation and lack of connection with their patients. Local and national conferences have been canceled or are being conducted in a virtual space, further creating a feeling of professional isolation. Reduced shifts, hiring freezes, and increased telework challenges a sense of team trust and meaningful practice that would normally engage the learner. Academic physicians are responding by adapting their role as educators, innovating new ways to teach and engage students. Finally, we have seen how governmental and organizational leadership impacts the morale and function of our medical system, for better or worse. We believe that these themes could potentially be used for just in time training or preparation to ease the transition.

Conclusion

We identified six themes that describe the differences in LE between the stateside and deployed setting and discussed how they impact the learner needs of Navy Emergency Medicine physicians. These themes are consistent with a recent conceptual model by Gruppen and we believe our results inform potential strategies to position the deployed medical unit for success.

Disclaimer

The opinions and assertions expressed herein are those of the author(s) and do not necessarily reflect the official policy or position of the Uniformed Services University or the Department of Defense.

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Interview Questions

Psychosocial Dimension - Personal Component

1. Can you briefly describe what you did clinically on an average day?
2. I want to understand your perception of the practice environment while deployed and how it was different than your work environment stateside. Can you describe the difference for me? (You may need to define practice environment as the attributes of what makes your setting a good place to work)
    a. Prompts:
        i. Time focused on patient care
        ii. Community of peers
        iii. Quality of life
        iv. High levels of resilience vs exhaustion
        v. Well-being vs moral distress
        vi. Working and learning in a “meaningful” practice
        vii. Trust in a regulated system to support you
        viii. Worries about future endurance and capacity
        ix. Depersonalization
3. Which, if any, of these differences affected your ability to care for patients?
4. What kind of injury patterns did you see while deployed? Were there any injury patterns that were significantly different from those you saw while practicing stateside?
5. How was the medical management of patients different in the combat setting compared to stateside? Did you learn about that ahead of time, or did you learn it in-country?

Psychosocial Dimension - Social Component

6. Was there any transition time or turnover with the outgoing team when you arrived? If so, what did this involve? What did you learn during this time that proved to be most useful?

7. I want to understand the quality of interactions you had with other people while deployed and how these compared with what you experienced stateside. Can you describe that for me?

a. Prompts:

i. Peer-to-peer

1. Competition, cooperation, shared values and learner culture

ii. With team members

iii. Trust, feedback, clarity of expectations, communication, debriefing, instructional strategies, mentoring

iv. Members, structure, functioning, communication

v. With patients

1. Responsibility, acceptance, trust

8. Can you think of a case where there was conflict amongst the care team? How was it handled? Was this any different from the way it would be handled at home?

. Conflict between medical specialties

a. Rank

b. Joint teams

c. Defining team leader

9. How did these social interactions affect your ability to care for patients? (ask if not addressed)

Psychosocial Dimension - Organizational Component

10. So we talked about your personal interactions with the environment and your interactions with other people. Now I want to think at the organizational level. How did you navigate interactions with the larger organizational structure? How did these interactions differ from those you had stateside? Are there any areas that were challenging and affected your ability to provide effective patient care?

a. Prompts:

b. Leadership (within the medical unit or on the base)

c. Policies

d. Performance measures

e. Organizational culture
f. Access to medical references or records
g. Duty hours and fatigue management
h. Professionalism
i. Interactions with the community
j. Patient safety
k. Language barriers
l. Cultural barriers
m. Inter-changability of medical elements

11. How did patient transport work while deployed? Were you prepared to work with that system of patient movement? (within facility and interfacility)

Material Dimension - Physical Space

12. How was the physical space in which you worked different from your stateside workplace? By this I mean the size of your medical unit, and the supplies and equipment that you had available?

a. Prompts:
b. Physical structure where care was rendered
c. XR, labs, blood products, resuscitation equipment, ventilators
d. MEDEVAC capability
e. Health records
f. Communication with other medical units
g. Consultant services available? Locally? Via phone?

Material Dimension - Virtual Space

13. Can you describe your ability to access medical references such as UpToDate, clinical practice guidelines, etc.? Was accessibility different from what you had stateside?

Conclusion (if time allows)

14. Were there any cases that could have gone better while deployed? What could have better prepared you?

15. Are there any things that you wish you'd known about to better prepare you for practicing medicine in a combat setting?

16. If you had the opportunity to give advice to a person about to deploy, what would you share with them to help them prepare?

17. Are there any other differences between your deployed setting and your stateside training that you think impacted patient care?

Table 1: Study Subject Demographics

		Number (%)
Gender	Male	4 (33%)
	Female	8 (67%)
	Total Subjects	12
Medical School Type	Civilian	11 (92%)
	Military	1 (8%)
Residency Type	Civilian	2 (17%)
	Military	10 (83%)
EM Residency Graduation Year	2009	1
	2014	1
	2018	2
	2017	8
Deployment experience prior to the deployment discussed for this study	GMO	6 (50%)
	none	6 (50%)
Description of deployment that was the focus of the interview for this study	Role 2	3 (25%)
	Role 3	3 (25%)
	SPMAGTF	3 (25%)
	MEU	3 (25%)

Legend:

GMO: General Medical Officer. The medical officer is a primary care physician for an operational unit with board certified/eligible physician oversight

Role 2: EM physician performing damage control resuscitation in the golden hour of trauma in a resource limited setting

Role 3: EM physician performing more definitive care with trauma management resources such as surgical specialties, ICU care, and advanced imaging

SPMAGTF: Special Purpose Marine Air Ground Task Force. Forward deployed medical contingency asset in which the EM physician prepares the unit for response

MEU: Marine Expeditionary Unit. Ship board contingency asset in which the EM physician prepares the unit for response

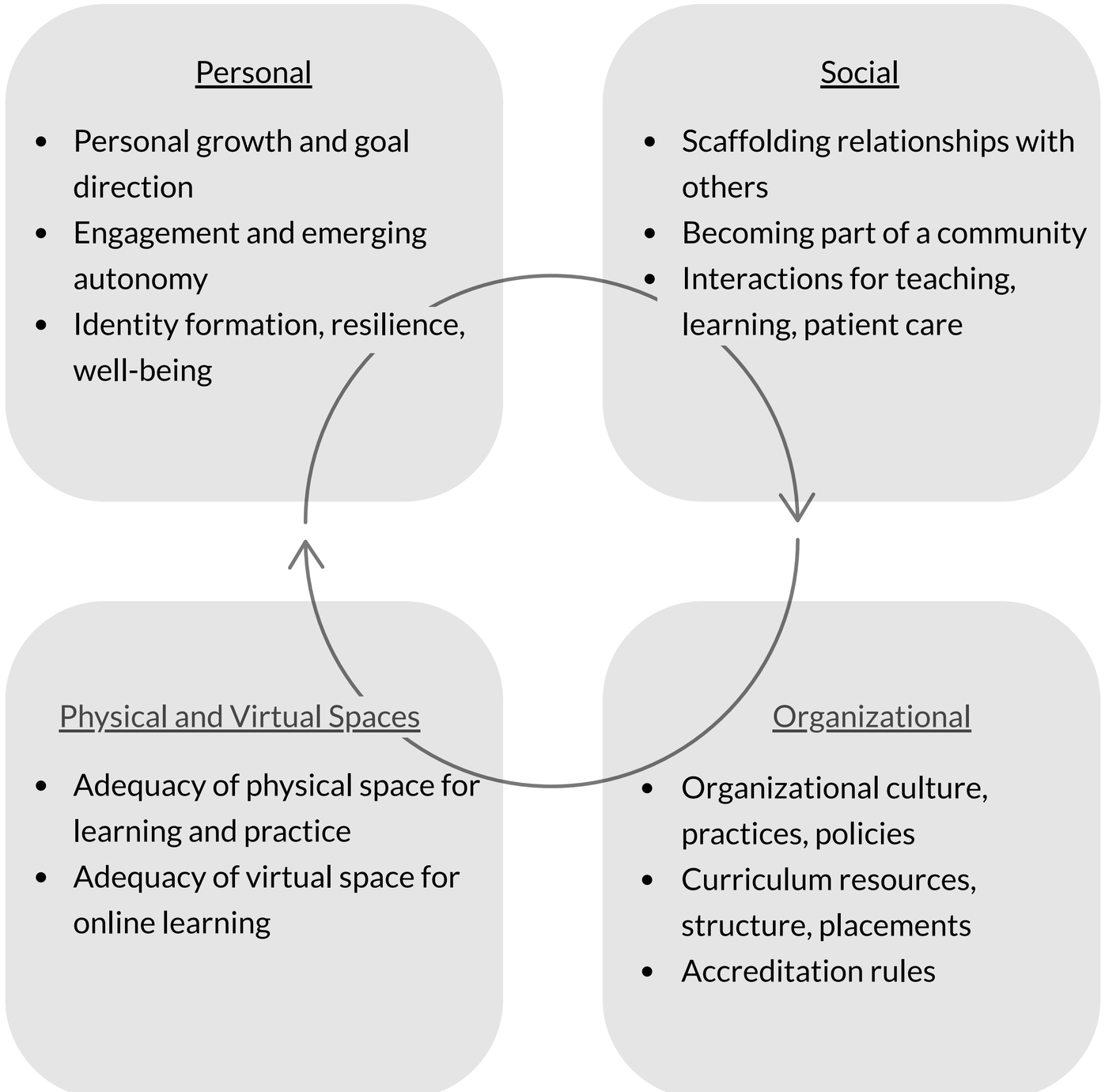
Theme	Participants adaptation to the LE	LE strategies for leadership	Sample quotation
Patient is Central	Practice active learning	Match training and patient care exposure stateside as closely as possible to the LE of the deployed setting. Make training as realistic and detailed as possible.	*“I wouldn’t say that I felt totally ready for it [massive transfusion protocol] when we arrived, but I feel like I felt ready for it by the time we had done a couple of drills and really talked about it”*
	Use simulation for maintenance of knowledge and skills	Provide simulation equipment in the deployed environment. Use the full potential of simulation by challenging physicians to perform detailed procedures, discuss complex medical decision making, and practice cases that include challenges unique to the LE.	*see above comment*
	Maximize the learning potential from each patient encounter	Establish systemic ways for providers to follow patient care through the echelons of care.	*"Ask more questions and take more time to go over patie encounters”*
	Study Clinical Practice Guidelines (CPGs)	Ensure widest dissemination of CPGs, including those engaged in civilian residency. Integrate CPGs into stateside training.	*"I honestly didn't even know what CPGs were”*
	Seek out virtual patient cases to increase exposure to patient volume and diversity. Discuss cases with physician peers.	Encourage opportunities for providers to experience a wide range of virtual patient cases to maintain complex clinical decision making capacity. (virtual cases, chart reviews, case reports). Encourage physicians to discuss patient cases with peers to explore the finer points and subtleties of the clinical presentation.	*"I have a good support system of two other awesome fem navy ER docs [in the US]...whatever patients they see in garrison that are complicated...they run those patients by so I can tell them what my management would be, and th would tell me if I'm right or not."*
Isolation	Connect to other physicians by participating in remote educational conferences	Provide resources necessary to remotely and securely connect physicians to educational conferences. Establish a network of conferences that will share their content virtually.	*"We were pretty isolated, but we were able to call into JTS [Joint Trauma System] conference every…It was nice to h familiar voices. It made you feel less isolated.”*
	Use simulation and MASCAL exercises to encourage team cohesion	Provide medical units with pre-planned MASCAL drills. and resources for simulation.	*"I think that practicing together as a team is really importa which is why the MASCAL drills were good...just for team building”*

	Consult liberally	Reduce barriers to specialty consultants	*“I see shoulder pain every day in the ER…but when I kno that my orthopedic surgeon is having coffee in the next te over…I’m much more likely to do an exam and figure out what I would do…and then go over and get him and say l at this shoulder and let me know what you think and then myself”*
	Monitor for team members who are isolated and attempt to engage them; screen for depression	Establish a system to screen for isolation, depression, anxiety and exclusion.	*"At that point the learning had ended. I went to a very emotional, very dark place, I isolated myself, I stayed awa from people...There was no learning, there was no nothin was just trying to survive the deployment."*
	Participate in group study plans rather than individual study plans	Encourage opportunities for group study	*"We presented all the CPGs...we all read it and then we'd have a discussion on it [as a group]."*
Meaning	Seek to understand the role of medical	Leadership should work to convey the role of medical and its contribution to the greater mission and contributions of the medical unit.of the deployed unit.	*"The more senior you get, the more you’re in the room for conversation about mission...I'm constantly pushing that message down to the deckplate level."*
	Look for meaning in patient encounters	Use patient encounters (when available) to highlight meaning.	*“When we actually had true trauma patients…the mission more focused...You feel like you’re doing something that’s important.”*
	Discuss purpose and meaning with others	Openly discuss physician feelings about purpose. Make counseling resources available.	*“[It] is our duty to be here and be ready. But there definite was a lot of the time that I felt like what am I doing here.”*
	Set expectations for what meaningful practice will look like both in high and low patient volume environments	Discuss mission and meaning purpose in the predeployment period to set expectations. Talk openly about how expectations may differ from and reality with regard to purpose..	*"In the beginning of deployment I was excited, I was pump up...very motivated...In the middle of deployment…I felt lik left all my friends and family, and I'm not doing anything personally [or professionally] rewarding…I had all these s I trained on but was not using."*
Educator	Reach out to the broader network of experience and skills in your medical unit and engage them as teachers	Create opportunities for medical professionals to learn the experiences and skill sets of one another and create opportunities for them to contribute to educational efforts.	*“There was expertise that we could steal from, although w didn’t have any ER nurses, there were two ICU nurses…t trained our ER nurses to do the ER role with guidance fro us. One of our corpsmen...had deployed a bunch of times*

			he was the most familiar person in the group with how a r 2 runs and functions."
	Physicians set the tone of the LE for the larger medical unit	Set expectations that one responsibility of the deployed physician will be to set the tone of the LE and the physician will organize educational opportunities for the team. Provide these physiciansm with resources for this for curriculum development. .	
Trust	Continually discuss roles and plan for team function.	Train teams on conflict resolution and team dynamics.	*"Everybody wants to show...how competent they are. Con always arises."*
	Attempt to understand the work culture and LEs of different specialties. Discuss integration.	Explicitly educate teams aboutDiscuss howw roles expectations may differ, and how roles are constructed by the group fluid and will need to be established. Provide an opportunitiesy for ongoing team discussions.	*"I was the only Emergency Physician...I had physician pe but we were "siloed specialties." We are great within our specialty, but there is a difference in understanding."*
	Engage leadership if you feel that rank or personality is precluding you from participation	Support physician contribution based on competency rather than rank or personality	*"There was an O-4 ER physician but there was an O-6 anesthesia physician and the O-4 ER physician was tryin run the code but the O-6 anesthesia guy was like nope we doing this."*
	Debrief every patient encounter	Educate teams on debrief techniques and create the expectation that this will occur regularly	*"Everything we do we debrief."*
	Work with your team to discuss clinical experience and identify knowledge gaps to focus training goals	Encourage physicians to discuss insecurities about competencies that they feel less prepared for (e.g. walking blood bank, subclavian lines, massive transfusion resuscitation).	
	Get to know teammates personally and professionally during the pre-deployment period;	Create opportunities in the pre-deployment period for team members to discuss background, expectations, and experience.	

Larger Military Organization	Graduated return to practice after deployment	Physician scheduling should optimize conditions to support physicians as they re-enter the stateside workforce, to give them time to acclimate to the stateside LE.	*"My first patient [after deployment] was a 9 yo with bacter meningitis, who was completely altered and sick...if they [colleagues] weren't there I feel like...I was slow to make decisions...I honestly felt like if I was on that shift by myself...it wouldn't have been a good outcome."*
	Familiarize yourself with local procedures and policies prior to re-integration to the stateside ED	Minimize the time that physicians are away from stateside emergency departments. Consider shortened, more frequent deployments.	*"My biggest challenge with maintaining competency is not much the science, it's the skill of managing multiple patien multitasking, interacting with nursing, leveraging extenders...which is a skill."*
	If prior military experience is limited, actively seek to understand military structure and function	Maximize organizational support for civilian residency graduates and those without prior deployment experience.	*"I went from residency to a Marine Corps unit, with no medical mentor or Navy mentor...I didn't even know how t write a FITREP [performance report]...I had to figure it out my own."*
	Understand the dual oath as officer and physician	Discuss case studies that highlight the ethical considerations of military medical practice	*"What is their function in that command?...If I take this pe out, what's going to happen with their unit?"*

Figure 1: Learning Environment framework*



*adapted from Gruppen et al. [5]

Figure 2: Thematic results on learning environment framework in the deployed setting