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The Journal of Collegiate Emergency Medical Services

December 2020

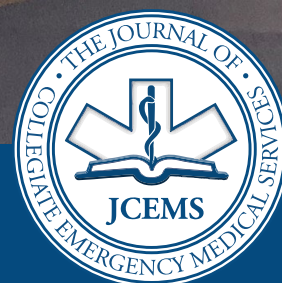
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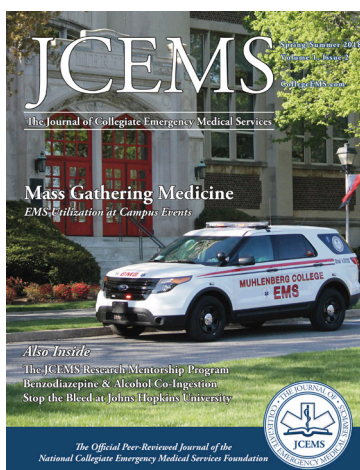
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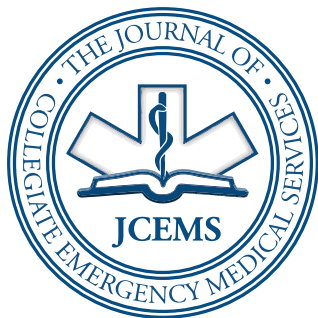
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# The Journal of COLLEGIATE EMERGENCY MEDICAL SERVICES

The Official Journal of the National Collegiate Emergency Medical Services Foundation

## TABLE OF CONTENTS

### Editorial

- 5 Reflecting and Rebuilding after 2020  
*A Message from the JCEMS Team*



### Original Research

- 11 A Survey of Canadian, Student-Run Campus  
Emergency Medical Response Teams  
*Evan A. Formosa, MSc; Lexie A. Grainger, MD;  
Austyn D. Roseborough, MSc; Andrea M. Sereda,  
MD; Lauren E. Cipriano, PhD*



### News & Commentary

- 6 How the Blue Hens are Responding to  
COVID-19  
*An Interview with the University of Delaware's  
EMS Squad Director of Public Relations*

### Perspectives & Opinion

- 8 Maintaining Collegiate EMS Readiness  
During COVID Campus Closures  
*Avery S. Alatis, MD & Jose V. Nable, MD, MS, NRP*

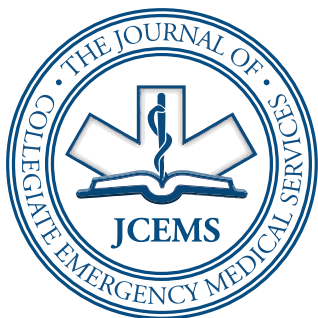


### Supplemental

27th Annual Conference of the National Collegiate  
Emergency Medical Services Foundation  
Academic Poster Session Abstracts

- S1 Implementation of a Peer Support Program for  
Campus First Responders
- S2 Naloxone Training and Distribution Program  
in an Urban Collegiate Setting
- S3 The Relative Importance of Vital Signs in  
Campus-Based Emergency Services
- S4 Assessing the Adequacy of Behavioral Health  
Training for Collegiate EMT
- S5 Heart Rate and Heart Rate Variability as  
Indicators of Stress in Emergency Medicine  
Residents during Simulation
- S6 Promoting Youth Emergency Preparedness  
through Lifesaving Emergency Skill  
Workshops
- S7 Development of a Mass Gathering Medicine  
Training Program for Novice Collegiate EMS  
Providers

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# *The Journal of* **COLLEGIATE EMERGENCY MEDICAL SERVICES**

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# Reflecting and Rebuilding after 2020

## A Message from the JCEMS Team

Max Moss\*, EMT; Christopher Gaeta\*, EMT; Nicholas M.G. Friedman, BA, EMT

\*Contributed equally to this work

**Keywords:** collegiate-based emergency medical services; covid-19; coronavirus | **Corresponding Author and Author Affiliations:** Listed at the end of this article.

The collegiate or campus-based EMS (CBEMS) community has faced unprecedented challenges in the past year. As the COVID-19 pandemic continues to cause suffering across the world, many in our community have fallen ill or lost loved ones to the virus. Many have felt the economic impacts of the crisis and are fighting to make ends meet. And many are continuing to struggle with the mental health repercussions of social isolation and chronic stress.

Faced with the daunting tasks of confronting a global pandemic and navigating campus closures, this past year CBEMS agencies rapidly adopted operations to serve their communities in a time of need. Some squads spearheaded contact tracing efforts and assisted with testing on their campuses. In other cases, providers volunteered on the frontlines through state and local organizations. Every CBEMS provider has played an important role in combating this pandemic, whether by directly caring for patients, conducting medical research, or following public health guidelines and leading by example. We at the Journal of Collegiate EMS (JCEMS) have been uplifted and inspired watching our community navigate these decisions with integrity and unwavering optimism.

This past year has been marked not just by the pandemic, of course, but by a series of crises. From natural disasters to mass political protests, instability and change have been defining features of life. In particular, there has been a global reckoning with structural racism and police brutality. Police killings of Black Americans – including the murder of a fellow EMT, Breonna Taylor – have been brought to the forefront of the national conversation here in the United States. JCEMS stands in solidarity with Black and other marginalized communities fighting for dignity, health, wellness, opportunity, and life. We will commit ourselves in the coming years to help root out systemic inequities in healthcare and bring justice to marginalized patients and providers alike.

Looking to the future of the CBEMS community, many have already begun the work of rebuilding and reimagining. As evidenced by recent submissions to JCEMS, providers at numerous schools have developed a renewed focus on CBEMS research. All the while, CBEMS agencies are maintaining educational

standards – for example, through the National Collegiate EMS Foundation's remote learning program – and are preparing to reinstate operations upon reopening of school campuses. As a journal focused on research and scholarship, we recognize the importance of developing a literature base that supports CBEMS agencies in confronting the challenges ahead. This issue, for example, will feature a publication from Georgetown EMS on what CBEMS agencies can do to maintain high educational standards while planning to restart operations. We welcome additional submissions focusing on how CBEMS organizations can promote public health and fight injustice. We recognize that by sharing best practices, lessons learned, and innovative strategies, we can best serve our communities together.

To our readers and the entire CBEMS community: thank you for your resilience, your integrity, your persistence, and your compassion. While we cannot know what this next year may bring, we can be sure that you will all continue to fight for your patients, for public health, and for justice. Here at JCEMS we pledge to do the same.

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# How the Blue Hens are Responding to COVID-19

*An Interview with the University of Delaware's EMS Squad Director of Public Relations*

**Name:** Kerry Keough

**Hometown:** Wilton, CT

**Major:** Health Behavior Science

**Favorite EMS Memory:** We do a lot of bonding outside of shifts. We frequently would all go to the solar house (the station) and watch holiday movies.

**Fun Fact:** We routinely do pranks on one another. We hide an inflatable shark and put it in unique places to prank one another.



*This interview was conducted by JCEMS Director of Business Development, Christopher Gaeta.*

**Can you describe how you all at the University of Delaware (UD) routinely run shifts?**

We average four student volunteers on call for each shift. We love training. To break down those four roles, we have a Crew Chief, or sometimes called our "Cleared Tech," in addition to an Assistant Tech who is also an EMT. With that there is also a Cleared Driver, and then the fourth is usually an attendant which can range from a probationary member or those currently in EMT class.

**Before COVID-19, what was a typical shift like?**

It would depend on the day, but we do rig check regularly. Also, we cook meals in our kitchen area, discuss any interesting learning points from recent calls, or use the conference rooms if we have work to get done. People come over even when they are not on shift to just help out or build that communal bond.

**How has the virus impacted the squad's operations?**

We tried our best to stay in service during the onset of everything [March 2020]. Some students stayed on campus or in the area, and so they rotated to help the best that they could staff the rig. Given the pretty large decrease in students generally on campus calls went down.

**Was there any concerns with PPE supply levels?**

For PPE, we never knew about where we stood with that. Even today we are still not too sure when or if we will run out. The campus police at UD helped a lot with that given our close

interactions with them. Plus, we are a sub-section that falls under Public Safety so even before the pandemic we had a strong relationship with them.

**What was it like running calls during this time of social distancing from roughly March through the end of 2020?**

For the fall semester the university let some students come back to campus based on circumstances. For example, many freshmen were on campus if they chose. Only a small part of campus was open though, and similar to other schools we had quarantine dorms and other protocols in place to help mitigate the impact of COVID. Our squad did not get involved in contact tracing, so all the nursing students ran the COVID tests on campus. Monday and Wednesday it was mainly nursing students running that pretty significant undertaking with other campus stakeholders.

**From a more national view, there appears to be far more students applying to medical school. Are you seeing more interest for those wanting to join the squad this year?**

Due to COVID, it is hard to say. We had to close off applications to join. The new probationary class did not finish their training as the pandemic began to affect operations in March of 2020 so our squad had to pause recruitment this fall to finish training from the spring.

**What are you most proud of about your squad's COVID response?**

I was amazed by how many of our members stepped up to the plate. We did not know really anything about COVID. No one backed down and everyone wanted to help out. University of

Delaware Emergency Care Unit put together their own N-95 fit testing, and so this allowed us to settle some uncertainties about PPE precautionary procedures. We never have been afraid of fully running out of PPE. I think our members would find a way to keep the service running if we were out of PPE. Our command staff would go out of their way to allow our members to keep riding if it meant finding novel ways to obtain the appropriate PPE.

**Is there anything that you all are looking forward to when we hopefully are able to respond to calls without an inordinate amount of PPE?**

I think on calls the personal aspect of being with your patients and being able to interact with them normally is what I miss most. It is not that comforting to a patient when we are fully suited up. I think we have had a lot of calls in the past where it was sometimes necessary to give a hug when appropriate. Also, I think many of us are excited to get back to building that squad comradery where we all hang out at the squad's main base.

**Any advice for incoming first years that might be interested in joining the squad but aren't too sure about the commitment or what it entails?**

When I was going into campus EMS I did not know what this entailed. I really encourage those that have an interest to pursue this and have a discussion with current or prior UD squad members. I have made so many friends doing this and you learn so much. I would not be where I am today without it. Lastly, I

would just also stress that you get out what you put into this. If UD students are interested in learning more, they should reach out to our recruitment and retention officer.

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The University of Delaware Emergency Care Unit operates a number of different vehicles, including this quick response vehicle.

# Maintaining Collegiate EMS Readiness During COVID Campus Closures

Avery S. Alatis, MD & Jose V. Nable, MD, MS, NRP

**Keywords:** collegiate-based emergency medical services; covid-19; coronavirus | **Corresponding Author and Author Affiliations:** Listed at the end of this article.

The coronavirus 2019 (COVID-19) pandemic has resulted in the closure of college campuses across the globe.<sup>1</sup> It is unclear how long institutions of higher learning will continue their campus closures. Many institutions, such as California State University, have canceled on-campus classes through fall 2020.<sup>2</sup> Keeping students off campus, however, is likely depleting the available workforce of collegiate-based EMS (CBEMS) agencies. Additionally, campus closures may significantly reduce on-campus call volumes. As such, many CBEMS agencies have likely been unable to continue operational prehospital services. CBEMS agencies are therefore challenged to maintain the clinical skills of their membership and prepare for the eventual reopening of college campuses. They must also prioritize the wellness of their providers during this stressful period.

## Maintaining Clinical Skills

The mastery of clinical skills deteriorates with time.<sup>3</sup> During normal operations, EMS providers can refresh their competency through repetitive skill utilization. For example, the acquisition of a blood pressure is a technical ability that can be used during the vast majority of patient encounters. When not in operational service, however, members of an EMS agency are unlikely to utilize this skill with any frequency to maintain proficiency. In addition to psychomotor abilities, clinical decision making is foundational to prehospital care.<sup>4</sup> The lack of patient care experience may lead to an erosion of this crucial skill as well.

CBEMS agencies are therefore faced with the prospect of needing to maintain these important skills among their membership, many of whom may no longer be located nearby. Leaders must innovate strategies to mitigate skill degradation so that prehospital providers are more readily able to provide care when their agency returns to active duty.

### *Remote Learning Opportunities*

With the closure of campuses, many universities have adopted online learning modalities.<sup>5</sup> CBEMS training officers may need

to similarly utilize analogous technology to maintain the skills of their members. In-person classroom learning and skills labs have long been foundational to teaching clinical skills. Social distancing and the closure of college campuses, however, makes traditional learning modalities impossible. Some medical schools, for example, are now teaching future physicians via virtual learning activities.<sup>6</sup>

Likewise, CBEMS agencies may need to run simulated cases via online platforms. Facilitated remotely, members can verbally engage in simulated patient encounters. In an oral patient case, the instructor provides the student with patient information, while the student verbalizes how they would assess and treat the patient. This allows students to practice critical thinking skills and refresh themselves on their agency's medical protocols.

The National Collegiate EMS Foundation (NCEMSF) has also partnered with an online EMS education platform (Prodigy EMS) to deliver continuing medical education courses without cost to its members. These remote courses also offer students the opportunity to continue to connect with fellow college EMS student providers.

### *Skills Refreshers*

Upon the re-entry of students into the campus environment, CBEMS agencies may find it useful to practice technical skills. Prior to returning to service, members should re-hone and demonstrate competency for crucial skills (such as taking vitals, oxygen delivery, splinting) in refresher labs.

## Operational Readiness

In addition to maintaining the clinical skills of individual members, CBEMS agencies are challenged at maintaining operational readiness. While it remains unclear when many college campuses will fully reopen, CBEMS organizations must continue various activities to ensure they are readily able to return to service when needed.

### *Personal Protective Equipment (PPE)*

CBEMS agencies will need to not only maintain, but likely expand, their stock of PPE. The Centers for Disease Control (CDC) recommends that EMS providers involved in direct patient care (including drivers, if they are involved in patient movement) or

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who ride in the patient compartment with a patient suspected of having COVID-19 should wear PPE, including N95 masks, eye protection (e.g. goggles or face shields), gloves, and gowns. In addition, universal masking of all patients is currently recommended, addressing asymptomatic and pre-symptomatic transmission.<sup>7</sup>

These recommendations are likely to cause a significant increase in the use of PPE. CBEMS agencies should work with their existing supply chains to establish adequate supplies of PPE; however, they may also need to utilize alternate sources to ensure appropriate stock. They may consider working with the academic or medical institutions with which they are affiliated to acquire additional supplies. If necessary, members should be fit-tested with whichever respirators they will be using prior to use in a patient care setting. Alternate types of PPE, including non-medical reusable respirators, face shields or goggles, and cloth surgical masks may also be considered.<sup>8</sup>

CBEMS agencies should also establish protocols for conserving, decontaminating, and reusing PPE where appropriate.<sup>8</sup> Agencies may wish to clean and reuse non-porous PPE such as face shields or goggles; they may also consider extended or re-use of N95s for multiple patients by covering them with a surgical mask to be changed after each patient encounter. Extended use involves wearing the same N95 with several patients, without removing the respirator between each patient. Re-use involves donning and doffing the same respirator multiple times.<sup>9</sup> CBEMS agencies should again work with the larger institutions with which they are affiliated to determine what, if any, means of recycling PPE are available and approved.

Equipment may also need to be modified to better protect providers. For example, bag-valve masks should be fitted with viral or HEPA filters to decrease aerosolization.

### *Other Supplies*

In addition to PPE supplies, CBEMS agencies experiencing a hiatus in their operations will need to maintain awareness of their other medical supplies. During normal operations, daily checks of supplies may allow agencies to become readily aware when medications or equipment need to be ordered to maintain an adequate and in-date supply. The closure of universities, however, may make this routine impossible. Agencies will, therefore, need to develop workarounds, such as electronic spreadsheets containing expiration dates of supplies, medications, and other equipment.

### *Regulatory Compliance*

CBEMS agencies should remain abreast of regulatory issues that may arise during the pandemic. For example, licensing authorities might extend expiration dates of provider prehospital licenses during declared public health emergencies. Routine inspections are potentially delayed. However, this may not necessarily be universally true. It would be prudent for CBEMS leaders to

communicate their operating status with state and local regulators, and to remain informed of critical updates from jurisdictional authorities.

### *Protocols Updates*

Medical directors should continue to update their CBEMS agencies' protocols to reflect changing practice patterns in the midst of COVID. For example, nebulizer treatments are suspected to cause aerosolization of SARS-CoV-2, the virus that causes COVID-19.<sup>10</sup> To protect their providers, prehospital agencies may find it necessary to eliminate (or minimize) the use of nebulizers, or use metered dose inhalers instead.<sup>11</sup> While members of agencies that are not in service during campus closures will not necessarily be immediately utilizing updated protocols, keeping prehospital providers abreast of novel protocols may keep them engaged in the evolving COVID-19 situation.

At Georgetown Emergency Medical Response Service (GERMS), the medical directors (authors of this article) have provided its members with regular and succinct updates utilizing the Situation/Background/Assessment/Recommendation (SBAR) technique. These SBARs facilitate timely education, protocol updates, and links to underpinning scientific evidence. Provider knowledge acquisition and comprehension of these updates is assessed via periodic quizzes.

### *Membership*

The closure of university campuses may make it challenging for CBEMS agencies to recruit and retain members, particularly organizations that rely exclusively on students. Recruitment officers may need to pivot their strategies, including holding virtual membership drives or advertising via social media. Interviews of candidates may need to be held online, with invitations to join the organization contingent upon re-opening of the campus.

### *Funding*

COVID-19 is significantly impacting the finances of institutions of higher learning.<sup>12</sup> Switching to online teaching, loss of philanthropy in the midst of an economic recession, and declining enrollment are hurting university budgets. CBEMS agencies may, therefore, experience dwindling support. Funded positions may be cut. Moreover, CBEMS agencies themselves may be forced to close as universities work to reduce cost centers.

CBEMS agencies should consider how leaner budgets may affect their operations. This may require cutting costs or increasing revenues through other sources.

### **Provider Wellness**

The COVID-19 pandemic is a significant source of stress for many healthcare providers, especially members of CBEMS agencies who face additional uncertainties about their academic obligations.

Fortunately, many resources are available for EMS providers, including hotlines and text lines for first responders, online listings of a variety of resources for well-being, and even specialized yoga classes.<sup>13</sup>

Leaders of CBEMS agencies should compile lists of resources provided by affiliated academic institutions. Focused education on signs and symptoms of burnout should also be included. They may also consider hosting town hall-style meetings to allow members to ask questions and express their concerns. Additionally, scheduled social events over video conferencing platforms may prove to be a useful avenue for fostering a sense of community and connectedness.

## Moving Forward

Finally, as COVID-19 is likely to significantly remake the higher education environment, it is crucial for CBEMS agencies to anticipate needed changes, and to identify and focus their missions in dramatically different conditions. This process, often referred to as strategic planning, can assist EMS agencies as they self-reflect on their internal strengths and weaknesses along with external opportunities and threats.<sup>14</sup> COVID-19 provides CBEMS agencies with an opportune time to define who they are, what their mission is, and how they anticipate they will accomplish that mission in a radically changed world.

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# A Survey of Canadian, Student-Run Campus Emergency Medical Response Teams

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## ABSTRACT

**Objectives:** Campus emergency medical response teams (CEMRTs) are organizations on university/college campuses who respond to medical emergencies. This study sought to determine the prevalence of these CEMRTs across Canada and characterize their training, operations and call volume. **Methods:** All identified Canadian CEMRTs were invited to participate in an online survey between February and April 2018. The survey requested information on years of operation, call volume, personnel, training level, medical direction, operations, funding, system activation, and mode of response. **Results:** Twenty-three CEMRTs completed the survey. Ten teams (43%) provide on-call service 24 hours per day, 7 days per week. Nine teams respond to <100 calls/year, 11 teams to 100-500 calls/year, and three teams to >500 calls/year. Teams ranged in size from 16 to 75 responders (mean 41.7 [SD 16]) and all were student volunteers. Training level varied, with 48% of CEMRTs being trained at the First Responder level and 48% having physician oversight. An automated external defibrillator was carried by 91% of CEMRTs and high-volume teams tended to carry more symptom relief medication. **Conclusions:** Many CEMRTs are operating throughout Canada but with significant variation in many aspects of operation. Further studies characterizing the types of incidents CEMRTs respond to are needed to better understand their role on Canadian campuses.

**Keywords:** first responders; prehospital emergency care; students; universities; volunteers

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University and college campuses are diverse communities. Campus communities are high-population-density, nearly city-sized groups of predominantly healthy young adults. Others on campuses include faculty, staff, and community visitors who may be more representative of the general population. Campuses may be located within the fabric of a city or they may

be a distinct self-contained geographic region. For self-contained campus communities, the on-campus population at night may be smaller, generally consisting of students living in residence buildings. Often times the students living on campus are living independently for the first time and are simultaneously exposed to new social and educational stressors. Compared to other populations, undergraduate students have higher levels of alcohol use,<sup>1</sup> are more likely to participate in binge drinking activities,<sup>2-4</sup> and are more likely to have other high-risk behaviours which make them more prone to injury.<sup>5,6</sup> As a result, this population can have high rates of emergency medical services use.<sup>7,8</sup>

Campus emergency medical response teams (CEMRTs), also called collegiate-based emergency medical systems,<sup>9</sup> are organizations of staff or volunteer responders, familiar with the campus community and its particular geography, trained in first aid that respond to medical emergencies with high-value first response care.<sup>9-13</sup> Various levels of medical training, offered by multiple certifying agencies, are available to CEMRTs operating in Canada. CEMRT training can range from basic first aid to courses targeted to professional first responders. Common training levels are described in Table 1. Some CEMRTs train to the Emergency Medical Responder (EMR) level, which requires demonstration of specific competencies as defined in the National Occupational Competency Profiles set by the Paramedic Association of Canada.<sup>14</sup> EMR is considered below the level of a primary care paramedic (PCP), the designation that

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is required to work for a regional emergency medical service. Certification as a PCP requires a college degree, and often candidates must pass a provincial certifying exam consistent with their greater scope of practice and responsibility.<sup>14</sup> With medical direction from a physician, some CEMRTs may perform basic delegated medical acts, such as administration of epinephrine for anaphylaxis and albuterol for asthma exacerbation, but this is not required for basic operation.<sup>15</sup>

CEMRT responders are located on campus, allowing for quick response to life-threatening emergencies, assistance of local PCPs, and management of minor incidents that may not require a PCP.<sup>11,12</sup> CEMRTs also triage calls with in-person assessment to identify those that require paramedic response, direction to urgent care, and/or direction to campus health services for primary care or mental health care, helping to reduce the burden on local emergency services.<sup>10-12,16</sup> Further, CEMRTs are able to build trusting relationships with their community, which may increase reporting of life-threatening but stigmatized behaviours.<sup>16</sup>

An often-overlooked aspect of emergency response to university and college campuses is the complexity of the campuses and the buildings. Buildings are often clustered together, sometimes requiring navigation through one building to reach another. Buildings are often known by names or nicknames rather than street addresses, which may result in callers providing confusing or incomplete information for emergency services. Familiarity with the networks of connected campus buildings is essential for the quick location of an ill or injured person, which may be outcome-determining in some life-threatening emergencies.

Two previous surveys characterizing North American campus-based emergency medical services were published in 1996<sup>13</sup> and

2006<sup>9</sup> using different methods to identify CEMRTs in operation. King et al.<sup>13</sup> identified 234 CEMRTs across the U.S. and Canada, the majority of which used paid professional staff (62%) for some or all response duties. Fisher et al.<sup>9</sup> used the National Collegiate Emergency Medical Services Foundation (NCEMSF) registry identifying 145 CEMRTs, including one in Canada, 73% of which were exclusively volunteer-based. Due to the lack of research within Canada specifically, the objectives of this study were to determine the prevalence of CEMRTs across Canada, to characterize the operations, range of training level, and call volume of Canadian CEMRTs, and to gain an understanding of their role within their community emergency medical service (EMS) systems.

## Methods

### Study population

Teams were identified through the Association of Campus Emergency Response Teams of Canada (ACERT), the National Collegiate Emergency Medical Services Foundation (NCEMSF), and the study authors' prior knowledge. The ACERT website listed 25 unique teams, 13 of which were also listed on the NCEMSF website. An additional five teams were identified by the authors, three of which were located in Nova Scotia and two in British Columbia. All 30 known Canadian campus emergency response teams were contacted by email using the teams' official email address published on publicly available team websites. Between February and April 2018, teams were sent a maximum of three reminder emails. All survey respondents were required to confirm that they were authorized to disclose the requested information for their organization. Consent for follow-up with survey respondents was obtained in the event that clarification of survey responses was required.

Table 1: Summary of Canadian First Aid training courses<sup>17</sup>

	SFA with CPR	First Responder	Emergency Medical Responder
Course length	13-14 hours	40 hours	80-120 hours
Primary use	Occupational requirements or home emergencies	Professional first responders (e.g., police, fire)	Emergency care professionals responsible for initial assessments, safe and prudent care, and patient transportation (e.g., fire and rural EMS)
Content of training course	<ul style="list-style-type: none"> <li>Breathing and circulatory emergencies</li> <li>Respiratory arrest</li> <li>Cardiac arrest</li> <li>Wound care</li> <li>Head and spine injuries</li> <li>Sudden medical emergencies</li> <li>Environmental emergencies</li> </ul>	SFA with CPR plus: <ul style="list-style-type: none"> <li>Anatomy and physiology</li> <li>Assessment</li> <li>Shock</li> <li>Hemorrhage and soft tissue injuries</li> <li>Chest, abdominal, and pelvic injuries</li> <li>Crisis intervention</li> <li>Reaching, lifting, and extricating</li> <li>Multiple Casualty Incidents</li> </ul>	First responder plus: <ul style="list-style-type: none"> <li>Transportation</li> <li>Pharmacology</li> <li>With Medical Direction:               <ul style="list-style-type: none"> <li>Glucometry</li> <li>Epinephrine</li> <li>Albuterol</li> <li>Aspirin</li> <li>Etc.</li> </ul> </li> </ul>

SFA: Standard First Aid; CPR: cardiopulmonary resuscitation; EMS: emergency medical services



Table 2: Universities and colleges with campus emergency medical response teams

Team	Year of inception	Number of student volunteer responders	Response during academic year			Annual call volume
			24/7	Select on-call hours	Special events	
West of Ontario (13%)						
University of British Columbia (Okanagan)	2015	70	X		X	100-500
University of British Columbia (Vancouver)	2010	30			X	100-500
University of Calgary	2014	40		X	X	<100
Ontario (70%)						
Carleton University	1999	45	X		X	100-500
Fanshawe College	2009	40		X	X	100-500
Fleming College	1998	20		X	X	<100
Laurentian University	2016	22	X		X	<100
McMaster University	1982	30	X		X	>500
Queen’s University	1986	43	X		X	>500
Trent University	1993	23	X		X	100-500
University of Guelph	1988	45		X	X	100-500
University of Ontario Institute of Technology – Durham College	2007	60	X			100-500
University of Ottawa	2014	42	X			100-500
University of Toronto (St. George)	2006	75			X	NR
University of Waterloo	1998	50			X	100-500
University of Windsor	1999	40	X		X	<100
Western University	1989	50	X		X	>500
Wilfred Laurier University	1994	28		X		100-500
York University	2016	60			X	<100
East of Ontario (17%)						
Acadia University	2017	16			X	<100
Dalhousie University	2014	55			X	<100
McGill University	1997	50		X	X	100-500
St. Francis Xavier University	2016	24		X	X	NR

NR: not reported

*Survey development*

The body of the survey collected information about the number of years the team has served their campus community and recent-year call volumes; personnel, staffing, and medical direction; the level of training and equipment carried; and operations, system activation, dispatch, and mode of response. The survey was implemented using

the Qualtrics platform (Qualtrics, Provo, UT). The complete survey is provided in the Appendix (available online).

*Ethics*

The study was approved by the Western University Health Science Research Ethics board (110066).

## Results

Twenty-four teams (80%) responded to the survey. Six teams thought to be in operation did not respond to the survey. Four of these teams were from Ontario, one was from British Columbia, and one from Nova Scotia. One respondent team, Ryerson University Student Emergency Response Team, was no longer in operation, so 23 teams were included in the final analysis. Most CEMRTs who responded to the survey (20/23) were identified through the ACERT and NCEMSF websites. Teams not identified on an association website who responded to the survey were more recently developed, possibly explaining why they may not yet be registered with ACERT or NCEMSF. All Canadian university and college campuses with an active CEMRT that responded to the survey are listed in Table 2.

### *Demographics and call volume*

Teams were stratified in low-, medium- and high-volume groups based on the average number of calls they received per year (May to April) for 2015/2016 and 2016/2017. The call volume data was visualized, and natural or substantial breaks were identified resulting in a low-volume group with fewer than 100 calls/year and a high-volume group with greater than 500 calls/year. Two teams did not disclose their call volumes and are excluded from stratification by call volume. Seven teams (30%) responded to fewer than 100 calls/year, 11 teams (48%) responded to between 100-500 calls/year, and three teams (13%) responded to greater than 500 calls/year (Table 3).

Sixteen teams (70%) were located in Ontario (Table 3). All high-volume teams had been in operation for greater than 25 years whereas two-thirds of low-volume teams had been in operation for less than five years. Teams ranged in size from 16 to 75 active student responders (mean 41.7; standard deviation 16).

### *Method of dispatch and response*

Of the survey respondents, ten teams (43%) indicated that they were dispatched when someone dialled 9-1-1 for a medical emergency (Table 3). Twenty teams (87%), including all teams that were dispatched via 9-1-1, were dispatched via the campus police or security service and 21 teams (91%) indicated that they were notified of emergency calls by patients or bystanders approaching them at events. Ten teams (43%) were also dispatched when calls were placed to their team office.

All 23 teams (100%) responded to calls on foot (Table 3). Four teams (17%) owned and operated a vehicle which was used for response, four teams (17%) were driven by campus security, and three teams (13%) used bicycles.

### *Training*

Training level varied greatly by team call volume. Low- and medium-volume teams were primarily trained at the First

Responder (FR) level, although some teams trained at the Standard First Aid (SFA) level, a mix of SFA and FR, or a mix of levels that included some members with EMR training (Table 4). One low-volume team reported that some members were trained as PCPs. Of the three high-volume teams, one was trained at the FR level, one at the EMR level, and one at the EMR level with some responders having additional certification in International Trauma Life Support and Advanced Medical Life Support.

Of the responding teams, 11 teams (48%) had designated Medical Directors with the frequency of medical direction increasing with call volume (Table 4). All but two teams carried an automated external defibrillator (AED), and nineteen teams (83%) carried oxygen. High-volume teams tended to carry more symptom relief medications. Sixteen teams (70%) carried a form of oral glucose, with five teams (22%) trained and equipped to perform finger stick blood glucose levels; 13 teams (57%) carried epinephrine; 12 teams (52%) carried naloxone; nine teams (39%) carried aspirin (ASA); nine teams (39%) were able to provide a patient with their own prescribed nitroglycerin spray; four teams (17%) carried salbutamol/albuterol; and two teams (9%) carried diphenhydramine. Nitroglycerin spray was carried by one team (4%) that had team members trained to the PCP level. This team was also the only team able to start intravenous lines. No teams carried any form of pain management medication.

### *Operations*

During the academic year, September to April, 10 teams (43%) provided 24/7 on-call response service including all high-volume, most medium-volume, and two low-volume teams (Table 5). Seventeen teams (74%) provided medical response services at campus events, including six teams (26%) that exclusively provided response coverage at campus events and did not provide a general campus on-call response service. Seven teams (30%) provided on-call response at select times throughout the week, such as from Thursday to Sunday or during an orientation week. Eleven teams (48%) provided summer services including event coverage and/or on-call response during specified hours.

### *Leadership and financial management*

Canadian CEMRTs are associated with various entities on campus, including student councils, health services, police, security, and emergency management/health and safety. Eight teams (35%) indicated that they are affiliated with two or more of the above listed entities (Table 5).

Teams had a variety of funding sources, with most teams relying on multiple sources of funding (Table 5). The most common funding source, used by 15 teams (65%), was a student fee, in which all university or college students pay a fee in their tuition that goes directly to the campus response team. The second most common source of financial support, used by nine teams (39%), was self-funding through teaching first aid courses to the university and



Table 3: Demographics, dispatch method, and response method of campus emergency medical response teams stratified by call volume

	Total	Low volume (≤100 calls/year)	Medium volume (100-500 calls/year)	High volume (>500 calls/year)
<b>Number of teams</b>	23	7	11	3
<b>Call volume</b>				
Median (IQR) [Range]	172 (49-412)	30 [0-75]	190 [114-460]	771 [649-892]
Mean (SD)	254 (260)	31 (28)	256 (132)	770 (121)
<b>Location of teams</b>				
Ontario	70% (16)	57% (4)	73% (8)	100% (3)
East of Ontario	17% (4)	29% (2)	9% (1)	0
West of Ontario	13% (3)	11% (1)	18% (2)	0
<b>Years of operation</b>				
< 5 years	35% (8)	71% (5)	18% (2)	0
5-15 years	17% (4)	0	27% (3)	0
16-25 years	30% (7)	29% (2)	45% (5)	0
>25 years	17% (4)	0	9% (1)	100% (3)
<b>Number of student volunteers</b>				
0-20	9% (2)	29% (2)	0	0
21-40	39% (9)	43% (3)	36% (4)	33% (1)
41-60	43% (10)	29% (2)	55% (6)	67% (2)
61-80	9% (2)	0	9% (1)	0
<b>Dispatched through 9-1-1</b>	43% (10)	22% (2)	45% (5)	100% (3)
<b>Dispatched via (could select multiple options)</b>				
Campus police or security	87% (20)	71% (5)	91% (10)	100% (3)
Direct call to team office	43% (10)	43% (3)	45% (5)	67% (2)
Approached at event	91% (21)	100% (7)	83% (9)	100% (3)
<b>Response method (could select multiple options)</b>				
On foot	100% (23)	100% (7)	100% (11)	100% (3)
Bicycle	13% (3)	14% (1)	9% (1)	33% (1)
Vehicle operated by team	17% (4)	29% (2)	9% (1)	33% (1)
Vehicle operated by security	17% (4)	29% (2)	18% (2)	0
Patients approach team members	91% (21)	86% (6)	91% (10)	100% (3)

**Notes:** Two teams, University of Toronto (St. George) and St. Francis Xavier University, did not provide call volumes for either year, so they were not stratified by volume and are only included in the Total column.

IQR: interquartile range; SD: standard deviation

the community. Departmental funding and institutional grants were each used by six teams (26%). Grants from outside the university or college were used by four teams (17%). One team (4%) held fundraisers and one team (4%) collected money from their volunteer responders to support team operations.

#### *Responder compensation*

All teams reported that all of their medical responders were volunteers. Five teams (21%) provided honorariums or hourly wages to members with specific administrative or leadership responsibilities (Table 5).

## Discussion

Canadian campus emergency medical response teams are operating at many universities and colleges across Canada, although they fall predominantly within in Ontario, which is home to some of the oldest teams. These teams, staffed with student volunteer medical responders, vary in size, services offered, level of training, mode of dispatch, and call volume among other metrics. CEMRT on-call responders are geographically close to the individuals they are called to assist, familiar with the campus buildings, and a prior survey of campus-based EMS services indicated an average

Table 4: Training information for campus emergency medical response teams

	Total	Low volume (≤100 calls/year)	Medium volume (100-500 calls/year)	High volume (>500 calls/year)
<b>Level of training*</b>				
Standard First Aid (SFA)	9% (2)	14% (1)	9% (1)	0
First Responder (FR)	48% (11)	57% (4)	45% (5)	33% (1)
Mixed SFA/FR	13% (3)	14% (1)	18% (2)	0
Emergency Medical Responder (EMR)	4% (1)	0	0	33% (1)
Mixed SFA/FR/EMR	4% (1)	0	9% (1)	0
Mixed FR/EMR	9% (2)	0	18% (2)	0
Mixed FR/EMR/Higher	9% (2)	14% (1)	0	33% (1)
<b>Teams with medical direction</b>	48% (11)	29% (2)	55% (6)	100% (3)
<b>Teams carrying symptom relief medication</b>				
Aspirin	39% (9)	57% (4)	18% (2)	100% (3)
Diphenhydramine	9% (2)	0	9% (1)	33% (1)
Epinephrine	57% (13)	57% (4)	45% (5)	100% (3)
Oral glucose	70% (16)	71% (5)	64% (7)	100% (3)
Salbutamol/albuterol	17% (4)	14% (1)	9% (1)	67% (2)
Naloxone	52% (12)	71% (5)	45% (5)	67% (2)
Pain management	0	0	0	0
Nitroglycerin (assist with patient's medication)	39% (9)	57% (4)	18% (2)	67% (2)
Nitroglycerin (carried by team)	4% (1)	14% (1)	0	0
<b>Teams with additional medical equipment</b>				
AED	91% (21)	86% (6)	91% (10)	100% (3)
Oxygen	83% (19)	71% (5)	82% (9)	100% (3)
Glucometer	22% (5)	29% (2)	9% (1)	67% (2)
IV start	4% (1)	14% (1)	0	0

**Notes:** Two teams, University of Toronto (St. George) and St. Francis Xavier University, did not provide call volumes for either year, so they were not stratified by volume and are only included in the Total column.

\* One team, University of Toronto (St. George), indicated mixed training levels but did not specify the mix and is therefore not included under level of training.

AED: automated external defibrillator; IV: intravenous line



Table 5: Administrative details of campus emergency medical response teams

	Total	Low volume (≤100 calls/year)	Medium volume (100-500 calls/year)	High volume (>500 calls/year)
<b>Response services during academic year (September to April)</b>				
Any event-based coverage	74% (17)	71% (5)	64% (7)	100% (3)
Event-based only	26% (6)	43% (3)	18% (2)	0
Select on-call hours	30% (7)	29% (2)	36% (4)	0
24/7 on-call; excluding holidays	22% (5)	14% (1)	27% (3)	33% (1)
24/7 on-call; including holidays	22% (5)	14% (1)	18% (2)	67% (2)
<b>Summer services provided</b>	48% (11)	29% (2)	36% (4)	100% (3)
<b>Affiliated campus entities</b>				
Student council or union	26% (6)	43% (3)	18% (2)	0
Health services	9% (2)	0	9% (1)	33% (1)
Police, security, or emergency management	30% (7)	14% (1)	36% (4)	33% (1)
2 of the above	26% (6)	29% (2)	27% (3)	33% (1)
3 of the above	9% (2)	14% (1)	9% (1)	0
<b>Funding source (could select multiple options)</b>				
General student fee	65% (15)	57% (4)	82% (9)	67% (2)
Providing first aid courses	39% (9)	29% (2)	45% (5)	67% (2)
Departmental funding	26% (6)	29% (2)	27% (3)	33% (1)
Institutional grants	26% (6)	29% (2)	18% (2)	33% (1)
Non-institutional grants	17% (4)	29% (2)	9% (1)	0
Fundraisers	4% (1)	0	9% (1)	0
Volunteer registration fee	4% (1)	14% (1)	0	0
<b>Team member compensation</b>				
Medical responders	0	0	0	0
Student leaders or members assigned specific administrative tasks	21% (5)	14% (1)	18% (2)	67% (2)

**Note:** Two teams, University of Toronto (St. George) and St. Francis Xavier University, did not provide call volumes for either year, so they were not stratified by volume and are only included in the Total column.

response time of <3 minutes.<sup>9</sup> We found that 91% of Canadian CEMRTs are trained and equipped to provide early defibrillation, 70% carry oral glucose, 57% carry epinephrine, and 52% carry naloxone indicating that CEMRT responders are trained and equipped to provide lifesaving care with rapid response times.

Only three Canadian CEMRTs, all providing 24/7 on-call response, had greater than 500 calls per year. This represents a small fraction of the number of calls for paramedic services operating within these communities. For example, a 2018 report from Middlesex London Paramedic Service, with a total catchment area population of approximately 400,000 including the population of Western University (30,700 students and 4000 staff and faculty),<sup>18</sup> indicated that they

responded to 60,840 calls for service with patient carry potential.<sup>19</sup> Often, an acute increase in call volume occurs during campus events such as concerts, which are staffed by the majority of CEMRTs (74%). For cities that operate a fixed number of ambulances, this can put extreme short-term demands on local EMS systems. CEMRTs' ability to triage calls may allow paramedics to respond only to those calls that require higher levels of care, easing operational strain and reducing costs for local paramedic services and municipalities. Evaluating this hypothesis is an interesting avenue for future study. However, a small private college in the United States observed an increase in the number of alcohol-related transports to a local emergency department after implementing campus-based EMS.<sup>16</sup> The authors of the

study attributed this increase to a higher level of social trust in peer responders resulting in an increase in reporting behaviour. Willingness to report is essential to meeting the clinically necessary level of medical response for any potential patient.<sup>20,21</sup> This role for CEMRTs as trusted peers has also been identified as important in campus responses to sexual assaults and mental health emergencies.<sup>10,22</sup>

Previous surveys have looked at CEMRTs across North America.<sup>9,13</sup> King et al.<sup>13</sup> surveyed college and university administrators to identify teams in the United States and Canada in the early 1990s. The authors reported variation in training level, with 79% of teams indicating at least some responders with first aid certifications, 60% of teams indicating at least some responders with Emergency Medical Technician (EMT)-Basic level training (approximately analogous to Canadian Red Cross EMR), and 40% of teams with at least some responders with EMT-Paramedic level training (approximately analogous to PCP training in Ontario). Further, they investigated the method of activation of CEMRTs. Activation through campus police was used by 76% of teams, which is similar to our findings for Canadian CEMRTs at 87%. Fisher et al.<sup>9</sup> surveyed teams registered with the NCEMSF in 2002 and reported a response from one Canadian CEMRT. They identified training level, response type, hours of operation, departmental affiliation, funding, and responder compensations.<sup>9</sup> Similar to King et al.,<sup>13</sup> Fisher et al.<sup>9</sup> reported most teams being trained at the level of EMT-Basic (66%), but a lower proportion of teams were operating with advanced or paramedic-level training. Consistent with the general public expansion of AED training and availability over the past 20 years, our study found that 91% of Canadian CEMRTs carried an AED compared to 70% of CEMRTs analysed in Fisher et al.<sup>9</sup>

One major limitation of this study was the reliance on self-reported data from individual teams, so the information collected may be subject to reporting biases. When information was unclear, we were able to follow-up with respondents to clarify their responses, hopefully improving the accuracy of the reports. Additionally, it is possible that teams were missed in this survey since most but not all Canadian CEMRTs are registered with ACERT or NCEMSF. In our study, five such teams were contacted and three submitted responses to the survey. These teams were identified through the authors' involvement in the Canadian CEMRT community. Finally, we did not investigate other roles CEMRTs may play on their campuses, including participation in health education campaigns (e.g., Stop the Bleed) or disaster scenarios. This would be important to characterize in future work.

In conclusion, this study is the first attempt at specifically characterizing Canadian CEMRT organizations and the services they provide. This is important to elucidate the communities in which these teams operate and to foster collaboration between local paramedic services and CEMRTs. This information can serve to inform providers of the capabilities of CEMRTs so that hospitals, paramedic services, and universities/colleges can ensure their communities are receiving the best care. This data may also

help inform other university and college campuses of CEMRTs and the role they can play on Canadian campuses. This study identified many CEMRTs operating across Canada with significant variation in training level, capabilities, call volume, and administrative operations. This variability is likely due to CEMRTs aiming to meet the specific needs of their unique campuses. Further investigation is needed to characterize the types of incidents these teams respond to and whether there are any savings in costs or resources for the local emergency services. Establishing the efficacy of CEMRTs is the next step in identifying their role in the campus community.

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## Supplementary Materials

**Appendix:** Full Survey (available online)

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## Implementation of a Peer Support Program for Campus First Responders

FIRST PLACE

Rebecca Butler, BSc; Justin Morell, BA; Noah Johnson; Peter McGregor

### POSTER PRESENTATION ABSTRACT | PROGRAM DEVELOPMENT & EVALUATION CATEGORY

**Introduction:** The Carleton University Student Emergency Response Team (CUSERT) is comprised of 45 on-call volunteers who respond to medical situations on campus. Due to increased call volume and concerns surrounding first responder mental health being brought to the forefront nationwide, CUSERT identified a need for responder support by individuals with shared experience. A Peer Support program was implemented in October 2019.

**Program Development & Implementation:** This program was developed following an assessment of CUSERT's unique needs. Three members received training through the First Responder Peer and Trauma Support System (FR-PATSS) course. CUSERT then launched a Peer Support program comprised of 1-on-1 and group sessions, as well as a library of resources.

**Program Evaluation:** Surveys have measured team satisfaction with CUSERT's Peer Support program and provided the opportunity for members to make suggestions. The program was well-received and will continue for the next academic year. Continuous evaluation will occur to ensure that the program is meeting its goals and remaining cost-effective.

**Discussion/Conclusions:** The implementation of this program is one step CUSERT has taken towards improving mental health support for campus first responders. Peer Support is an important resource for campus first responders to have access to, due to the unique nature of our role. We hope to expand the program to include other members of Carleton's Campus Safety Services.

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# Naloxone Training and Distribution Program in an Urban Collegiate Setting

SECOND PLACE

Andrew Lam, EMT; Samantha Steeman, EMT; Gabrielle Ramirez, EMT; Joshua Glick, MD

## POSTER PRESENTATION ABSTRACT | PROGRAM DEVELOPMENT & EVALUATION CATEGORY

**Introduction:** The opioid crisis plaguing America has been called Philadelphia's "greatest public health crisis in a century." Numerous members of the Penn and West Philadelphia communities live and work in areas where opioid overdoses will continue to occur. These bystanders have personally witnessed overdoses, but lacked either the training or means to effectively respond in multiple cases that Penn's student-run Medical Emergency Response Team (MERT) has been made aware of. Naloxone (Narcan) can rapidly reverse the effects of opioid overdoses. However, one pack can cost upwards of \$130, and free, in-person naloxone administration trainings by qualified instructors are rare.

**Program Development & Implementation:** MERT worked with physicians from Penn Medicine's Emergency Department to develop a 1-1.5 hour bystander naloxone training curriculum. The program consists of opioid crisis information, how to detect an overdose and administer naloxone, and integrates rescue breathing and CPR. MERT forged a partnership with Philadelphia's Department of Public Health to acquire a renewable Narcan supply for distribution to trainees who face financial, insurance-based, or societal barriers in obtaining naloxone. With an initial 96-dose Narcan supply, MERT provided pilot trainings to Penn Social Policy and Practice, Medicine, Nursing, and Education graduate students.

**Program Evaluation:** In anonymous post-training surveys since March 2019, the trainings' effectiveness received an average score of 4.83 (SD=0.41) on a Likert scale, with "1" representing "poor" and "5" representing "excellent." Participants who use Narcan supplied by MERT can report their use and receive another dose, allowing for continued evaluation.

**Discussion/Conclusions:** To our knowledge, this is the only collegiate EMS-run bystander naloxone training program to date. Collegiate agencies can play crucial roles in overdose awareness and prevention. Due to initial success, MERT will collaborate with Penn's Division of Public Safety to teach integrated CPR/AED/Narcan trainings and continue the existing program, while expanding into the greater West Philadelphia community.

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# The Relative Importance of Vital Signs in Campus-Based Emergency Services

THIRD PLACE

Alexander Quach, EMT; Yilong Peng, EMT; Trevor Gawronski, EMT

## POSTER PRESENTATION ABSTRACT | ORIGINAL RESEARCH CATEGORY

**Introduction:** One of the most important decisions a first-responder agency operating under Basic Life Support (BLS) jurisdiction can make is determining whether a medical emergency can be managed at the BLS level, or if additional resources must be requested in the form of Advanced Life Support (ALS) to facilitate transport to a hospital. This is particularly important in collegiate agencies, as not all may have the means or equipment to transport ALS patients. Studies show that ALS is beneficial in certain scenarios that BLS providers cannot treat effectively such as epileptic episodes or respiratory distress. This decision on whether to upgrade to ALS is based on several factors: patient demographics, the acuity and severity of the medical complaint, and provider-obtained metrics of health.

**Methods:** In this study, we examined the vital signs of patients (n = 357) at the University of Texas at Dallas, obtained by providers from the University Emergency Medical Response (UEMR) agency, and compared them to the established agency and local standards of upgrading to ALS.

**Results:** Compared to the national refusal rate of 5.1%, the refusal rate of UEMR is approximately seven times higher, which may be explained by the unique patient demographics found on college campuses. Through mono- and bi-factor analysis, we determined that there is a negligible correlation between the presence of abnormal vital(s) and ALS upgrade for a collegiate Emergency Medical Service (EMS) organization. Per UEMR Protocols, only 42% of patients presenting with an abnormal heart rate with normal rhythm, and 38% presenting with abnormal blood pressure, were upgraded to ALS, while only a slightly fewer number (~30%) were upgraded without abnormal vital indication. Furthermore, our research showed that out of all medical calls a provider did determine that ALS upgrade was required, only 31% of those patients presented with abnormal vitals, compared to about 24% of patients that presented with similarly abnormal vitals but were determined not to require an ALS upgrade.

**Discussion/Conclusions:** Due to the unique demographics and socioeconomic factors prevalent in a college patient population, this discrepancy, in contrast to traditional rural and urban EMS programs, indicates the changing role of vital signs as a diagnostic tool, rather than an inflexible reference point. Additionally, an internal poll of the UEMR members found that only 12% of providers have more than three years of experience and 21% having significant patient care experience outside of the organization itself. Inexperience tends to manifest in increased reliance on established protocols rather than a more holistic overview of the patient. This highlights the need for collegiate EMS organizations that have not yet reached internal ALS-transport capacity, to further examine vital sign assessments, and their inherent limitations against a general population, which is necessary to create and enforce effective healthcare protocol prior to and in the transference of medical care.

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# Assessing the Adequacy of Behavioral Health Training for Collegiate EMTs

Ali M. Baird & Carol R.T. Day, RN, MSN, CNS

## POSTER PRESENTATION ABSTRACT | ORIGINAL RESEARCH CATEGORY

**Introduction:** Increased prevalence and underreporting of mental health conditions on college campuses implies collegiate Emergency Medical Technicians (EMTs) may treat more patients with acute behavioral concerns. Georgetown Emergency Response Medical Service (GERMS), a collegiate based EMS (CBEMS) group, experienced a 450% increase in behavioral calls from 2014 to 2016. This study aimed to assess EMT self-reported preparedness for behavioral emergencies obtained from the EMT course and continuing education provided by GERMS. A secondary aim was to compare behavioral call experience to preparedness.

**Methods:** In March 2018, 60 members of GERMS completed an online 14-question survey to assess preparedness and helpfulness of educational material about behavioral health training using 0 (meaning least) to 5 (meaning most) Likert scales and multiple-choice questions. All metrics from the survey are self-reported. Coverage of behavioral health topics in the EMT course, helpfulness of educational experiences about behavioral health provided by GERMS, and behavioral call experience were each compared independently to preparedness.

**Results:** All participants reported lower preparedness when they could not recall behavioral health topics covered in their initial EMT course as seen by an independent sample t test of differences between recall and preparedness for panic attacks (3.96 for recalled, 3.12 for unrecalled;  $p=0.002$ ), thoughts of self-harm without suicidal ideation (3.54 for recalled, 2.69 for unrecalled;  $p=0.005$ ), suicidal ideations (3.12 for recalled, 1.80 for unrecalled;  $p=0.004$ ), and suicide attempts (3.13 for recalled, 1.81 for unrecalled;  $p<0.001$ ). Debriefs following behavioral emergencies was the only GERMS educational experience positively correlated with higher preparedness using Spearman's rho correlation. Using an independent sample t-test, behavioral call experience produced higher preparedness for all types of behavioral emergencies.

**Discussion/Conclusions:** Coverage of mental health topics in CBEMS groups is associated with perceived preparedness. CBEMS groups have an opportunity to improve behavioral health training to respond to the growing mental health crisis.

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# Heart Rate and Heart Rate Variability as Indicators of Stress in Emergency Medicine Residents during Simulation

Chase Hinman & Shane Jenks, MD, MEd

## POSTER PRESENTATION ABSTRACT | ORIGINAL RESEARCH CATEGORY

**Introduction:** This project was completed through collaboration between a Rice University Collegiate EMS research course and a Baylor College of Medicine EM Physician. When confronted with a stressful event, the human body responds by activating the sympathetic nervous system pathway. Studies have shown a relationship between stress-induced heart rate increases and cognitive performance. Certain cognitive tasks, such as memory recall and information processing, in many cases are negatively affected by such stress responses. Significant stress response has been shown in emergency medicine residents during regular shifts.

**Methods:** We measured stress-induced heart rate and heart rate variability of Baylor College of Medicine emergency medicine residents during a simulated case, specifically, a pulseless electrical activity cardiac arrest scenario. In addition to these vitals, and a few others, we also tested the resident's cognitive performance before and during the simulation. To measure physiological signs of stress we had the participants wear an Empatica E4 wristband. For cognitive performance level, the participants completed a trail-making test.

**Results:** Our data showed insignificant signs of stress levels during the case, but the cognitive performance level was significantly better during the case as compared to before.

**Discussion/Conclusions:** The data is consistent with the conclusion that simulation cases do not create stress levels seen during shift, but they may mimic cognitive improvement. This conclusion has interesting implications for collegiate EMS, in reference to training exercises and testing using scenarios. An important future study could perform similar tests but on EMTs.

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# Promoting Youth Emergency Preparedness through Lifesaving Emergency Skill Workshops

Tanisha Martheswaran

## POSTER PRESENTATION ABSTRACT | PROGRAM DEVELOPMENT & EVALUATION CATEGORY

**Introduction:** Recognizing the growing emphasis on youth emergency preparedness, as seen through the increasingly common graduation requirement of CPR training and through skill training camps, members of Harvard CrimsonEMS expanded outreach to Greater Boston high-school students through the formation of the CrimsonEMS Youth Education Task Force. This novel task force seeks to create a more medically-literate youth community through fostering preparedness in basic lifesaving skills and placing an emphasis on bystander intervention.

**Program Development & Implementation:** The task force, comprising of collegiate EMTs, designed a 90-minute workshop instructing students about taking proper action during common medical emergencies. This hands-on, rotating, station-based workshop covers CPR/ AED, Choking Management, EpiPen administration, and Bleeding Control. Stations have an average student-to-teacher ratio of 4:1, allowing for personalized instruction and feedback.

**Program Evaluation:** To date, the task force has reached over 170 high-school students from 9 workshops across Boston. Anonymous surveys were administered after workshop completion to assess the overall effectiveness of workshops based on confidence levels with basic medical skills on a five-point scale, with confidence defined as likelihood to utilize these skills during medical emergencies. With a 98% response rate from 170 students, 32% had previous firsthand exposure to at least one of the medical emergencies covered in the workshop. Prior to the workshop, students had an average skill confidence level of 2.96 out of 5; after workshop completion, skill confidence rose to 4.48 out of 5, with a notable 60% increase in bleeding control.

**Discussion/Conclusions:** Due to the developing nature of the program, this research is a quality improvement initiative, and substantial conclusions cannot yet be drawn from limited data. Moving forward, the task force hopes to incorporate asthma, overdose, and first-aid education, as well as to implement after-school programs or camps. This initiative demonstrates the ability for collegiate EMS organizations to engage with local youth to promote safer, more knowledgeable communities.

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# Development of a Mass Gathering Medicine Training Program for Novice Collegiate EMS Providers

Enzo Plaitano, EMT; Elana Everett, EMT-I/C; Sarah Golden, EMT

## POSTER PRESENTATION ABSTRACT | PROGRAM DEVELOPMENT & EVALUATION CATEGORY

**Introduction:** During large-venue events, EMTs must manage a multitude of patients using limited resources. Loud music, darkness, and dense crowds make it difficult to locate and treat guests effectively. Boston University Emergency Medical Services (BUEMS), a student-staffed BLS service, provides coverage for Agganis Arena, which hosts large-scale events for thousands. Agganis hosted 44% more concerts and shows in 2019 than 2018 and saw a surge of EMS calls, leaving new EMTs unprepared. Since any BUEMS EMT was eligible to work Agganis shifts, inexperienced EMTs were expected to manage emergencies without senior support. New hires reported feeling only 30% prepared to work at the arena, as conventional EMS education focuses mainly on single-patient ambulance transfers.

**Program Development & Implementation:** In response, we established a new training program to improve the quality of our services. Eleven New Agganis EMTs (NA-EMT) were required to attend a large-venue specific orientation and were continuously trained, mentored, and monitored by Agganis Experienced EMTs (AE-EMT) during all shifts. NA-EMTs were required to work at least 8 shifts, write 5 high-quality PCRs, and receive supervisor recommendations to qualify for an AE-EMT promotion. All BUEMS staff were required to attend a yearly large-venue inservice, beginning in April 2019, which included simulated medical and extrication scenarios. During the orientation and inservice, our staff was prepared to triage, extricate, and provide hands-on care to multiple simulated patients within the venue, all while retaining effective communication in the difficult environment.

**Program Evaluation:** Anonymous Likert scale and free-response surveys were completed by Fall 2019 BUEMS Agganis staff. All NA-EMTs found the orientation helpful in preparing for Agganis shifts. NA-EMTs were 44% more prepared ( $p < 0.001$ ) to work shifts and 29% better ( $p < 0.01$ ) at providing patient care compared to new staff before the orientation was implemented, as evaluated by AE-EMTs. During shifts, 100% of AE-EMTs provided further training to NA-EMTs on operations, venue layout, patient care, and writing PCRs. AE-EMTs reported a 77% (SD=22%) increase in team dynamics and 70% (SD=14%) increase in patient care efficiency as a result of the mentorship program. All surveyed staff found the inservice to be 83% (SD=10%) beneficial, with a 79% (SD=12%) increase in team dynamics as a result of the training.

**Discussion/Conclusions:** New protocols have promoted better team dynamics, higher staff confidence, and more efficient patient care. This program has enhanced the preparation of all staff in managing the difficulties of large-venue logistics and can be implemented into other collegiate EMS systems to improve their own large-venue operations.

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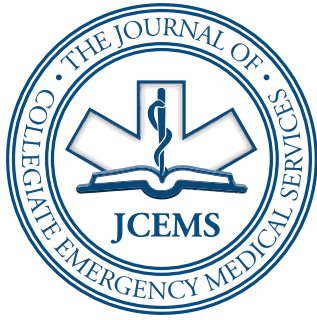
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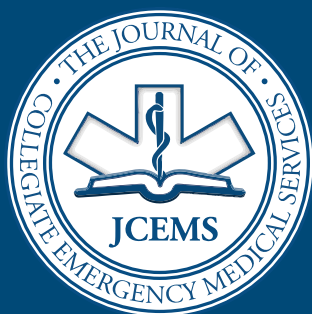


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