

**EMS Workforce:
Longevity, Wellness, Mental Health**


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Disclosures

- Professor of Emergency Medicine, The Ohio State University
- Research and Fellowship Director, National Registry of EMTs
- Medical Director, Delaware County EMS and Delaware Emergency Communications, Ohio
- Chair, Science Subcommittee, American Heart Association/Emergency Cardiovascular Care Committee
- Primary Investigator, NCI U54,
 - 1U54CA260582-01 , \$10 million total funding





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EMS Workforce

- Who's in our workforce?
- How do we measure our workforce?
- What challenges make our workforce "at risk"

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THE HILL
 Ambulance, EMT first responders face 'crippling workforce shortage'
 1,483
 NEWS
EMS agencies struggling to fill EMT, paramedic positions
 Laura Fitzgerald Port Huron Times Herald | May 19, 2021
Labor crisis creating 'gut-wrenching' reality for Ohio's EMS providers, help needed
 Ryan Cantzler Guest columnist
 Published 8:19 a.m. ET Dec 7, 2021 | Updated 9:51 a.m. ET Dec 8, 2021
 View Comments
NEWS OTHER POLICE US NEWS WORLD OPINION BUSINESS
EMS services warn of 'crippling labor shortage' undermining 911 system
 "We're not bleeding any longer - we're hemorrhaging," one ambulance service operator said of a decade-long worker shortage exacerbated by the pandemic.

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AMERICAN AMBULANCE ASSOCIATION
 October 2021
Congressional Letter on the EMS Workforce Shortage
 AAA and NAEMT Directed a letter to Congress to address these concerns
 October 1, 2021
 The Honorable Henry Petzel, Speaker of the House, U.S. House of Representatives, Washington, DC 20515
 The Honorable Kevin McCarthy, Minority Leader, U.S. House of Representatives, Washington, DC 20515
 The Honorable Charles Schumer, Majority Leader, United States Senate, Washington, DC 20510
 The Honorable Mitch McConnell, Minority Leader, United States Senate, Washington, DC 20510
 Dear Speaker Petzel, Majority Leader Schumer, Minority Leader McConnell & Minority Leader McCarthy:
 Our paramedics and emergency medical technicians (EMTs), as well as the organizations that they serve, take on substantial risk every day to treat and transport patients that call 911. But our nation's EMS system is facing a crippling workforce shortage, a long term problem that has been building for more than a decade. It threatens to undermine our emergency 911.

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The EMS Workforce

- Changing Paradigm
 - From 2014-2060, population will increase by 31%
 - To meet the growing population needs for 2030, workforce demand may increase by 11%

Occupation	Percent change in employment, projected 2014-30
Emergency medical technicians and paramedics	11%
Health technologists and technicians	9%
Total, all occupations	9%

Note: All Occupations includes all occupations in the U.S. Economy.
 Source: U.S. Bureau of Labor Statistics, Employment Projections program

Colby, Current Population Reports, US Dept of Commerce, 2015.
<https://www.bls.gov/ooch/healthcare/emts-and-paramedics.htm#tab-6>

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Demographics of EMS?

DEMOGRAPHY OF THE NATIONAL EMERGENCY MEDICAL SERVICES WORKFORCE
A DESCRIPTION OF THOSE PROVIDING PATIENT CARE IN THE PREHOSPITAL SETTING

TABLE 3. Job and agency characteristics of EMS patient care providers, overall and by certification level

Characteristic	Overall N=142,751 n (%)	EMTs N=71,303 n (%)	AEMTs N=7,043 n (%)	Paramedic N=64,415 n (%)
Main Agency				
Fire Department	68,680 (48.3)	36,626 (51.4)	3,636 (51.7)	28,418 (44.4)
Private	38,284 (27.2)	15,281 (21.4)	1,507 (21.4)	13,496 (21.0)
Governmental Non-Fire	17,159 (12.1)	7,504 (10.5)	902 (12.8)	8,753 (13.7)
Hospital	15,363 (10.8)	6,515 (9.1)	605 (8.5)	8,183 (12.8)
Other*	6,760 (4.8)	4,668 (6.6)	300 (4.3)	3,801 (5.9)
Air Medical	4,070 (2.9)	662 (0.9)	18 (0.3)	3,390 (5.3)
Missing	506	357	15	134
Service Type				
Primarily 9-1-1	101,866 (71.8)	50,486 (70.9)	5,400 (77.0)	46,080 (72.2)
Combination of 9-1-1 & medical transport	20,368 (14.3)	9,180 (12.9)	925 (13.2)	10,263 (16.1)
Primarily Medical Transport (overseas/air)	7,995 (5.2)	4,276 (6.1)	273 (3.9)	2,746 (4.3)
Clinical Services	6,109 (4.3)	3,488 (4.9)	222 (3.2)	2,399 (3.7)
Other**	5,295 (3.9)	3,344 (4.7)	173 (2.5)	2,078 (3.2)
Mobile Integrated Health/Community Paramedicine	630 (0.4)	325 (0.5)	22 (0.3)	283 (0.4)
Missing	688	404	28	256

Rivard M, PEC 2020: 25(2), 213

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Demographics of EMS?

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Characteristic	Overall N=142,751 n (%)	EMTs N=71,303 n (%)	AEMTs N=7,043 n (%)	Paramedic N=64,415 n (%)
Community Size				
Rural (<25,000 people)	49,253 (35.8)	29,010 (42.1)	2,996 (44.3)	17,247 (27.9)
Urban (>25,000 people)	88,207 (64.2)	39,850 (57.9)	3,766 (55.7)	44,591 (72.1)
Missing	5,291	2,733	281	2,277
Full Time				
1	109,784 (77.6)	48,325 (68.3)	5,286 (75.2)	56,200 (88.3)
Missing	1,309	413	57	439
Number of Organizations				
1	102,887 (72.1)	55,776 (77.9)	4,764 (67.6)	42,347 (66.0)
2 or more	39,864 (27.9)	15,817 (22.1)	2,279 (32.4)	21,768 (34.0)

Rivard M, PEC 2020: 25(2), 213

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Volunteerism

COMPARISON OF VOLUNTEER AND PAID EMS PROFESSIONALS IN THE UNITED STATES

TABLE 1. Comparison of the characteristics of nationally-certified volunteer and paid EMS professionals

Characteristic	Volunteer n=26,337	Paid n=134,688	Difference	TOST p*
Certification Level, n (%)				
EMT	16,763 (82)	61,477 (46)	37%*	<0.001
AEMT	981 (5)	6,386 (5)	0.1%	0.56
Paramedic	2,393 (13)	66,605 (50)	37%*	<0.001
Missing	0	0		
Community Size, n (%)				
Rural	14,632 (74)	38,907 (30)	44%*	<0.001
Urban	5,231 (26)	90,620 (70)		
Missing	474	4,541		
Primary Role, n (%)				
Patient care provider	17,493 (86)	110,585 (82)	4%	<0.001
Administrator/supervisor	837 (4)	14,788 (11)	7%	<0.001
Other*	1,911 (9)	8,755 (7)	3%	<0.001
Missing	56	340		

Cash R, PEC 2021:25(2):205-212

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Volunteerism

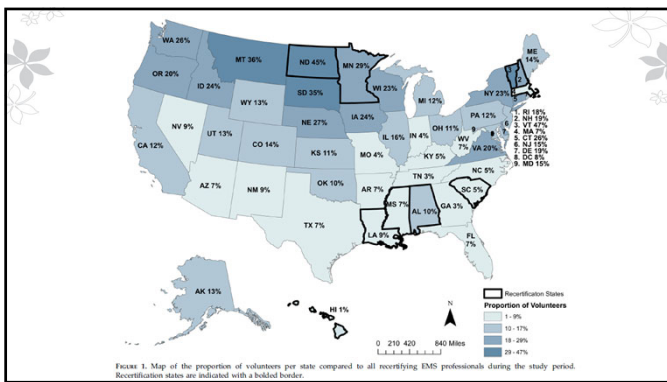
COMPARISON OF VOLUNTEER AND PAID EMS PROFESSIONALS IN THE UNITED STATES

TABLE 1. Comparison of the characteristics of nationally-certified volunteer and paid EMS professionals

Characteristic	Volunteer n=20,337	Paid n=134,868	Difference	TOST p [†]
Agency Type, n (%)				
Fire department	9,987 (50)	62,980 (47)	3%	<0.001
Municipal	3,373 (17)	16,819 (13)	4%	<0.001
Private	2,863 (14)	29,216 (22)	8%	<0.001
Other [‡]	3,895 (19)	25,096 (19)	0.6%	0.03
Missing	219	337		
Service Type, n (%)				
Predominately 9-1-1	16,556 (82)	92,303 (69)	13% [‡]	<0.001
Predominately medical transport	416 (2)	7,356 (6)	3%	<0.001
Equal mix of 9-1-1 and medical transport	1,472 (7)	19,986 (15)	8%	<0.001
Other [‡]	1,741 (9)	14,300 (11)	2%	<0.001
Missing	152	623		

Cash R, PEC 2021;25(2);205-212

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CHALLENGE!
Data concerning workforce is poorly defined and not well collected

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NHTSA 2013

EMS Workforce Planning & Development

GUIDELINES FOR STATE ADOPTION

Critical Policy Issues

Twelve critical policy issues were identified for further research and consideration for the development of the EMS Workforce Agenda. These were:

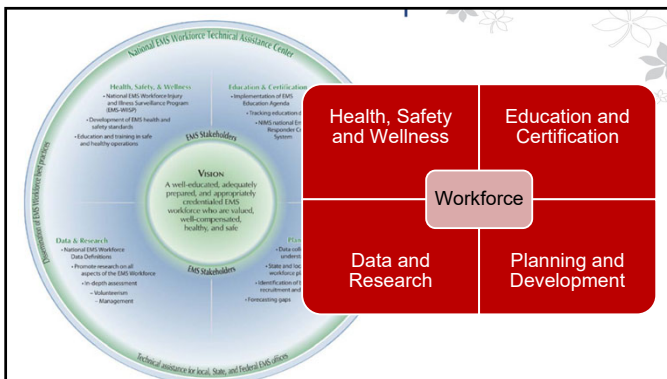
1. Establish consistent definitions, certification, and licensure (e.g., credentialing, registration, certification, and licensure).
2. To manage the capacity of EMS education, more complete data particularly on proprietary and agency-based programs is necessary.
3. Affiliation with an agency is often required in EMS education programs although the requirements vary widely among states. This results in difficult assessment of the impact of affiliation on the supply of EMS workers, there is no quantitative data indicating there is a shortage of EMTs or paramedics.
4. Although rural areas consistently report a shortage of EMTs or paramedics, qualitative data indicating there is a shortage of EMTs or paramedics is based on...

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Highlights of Critical Policy Issues

- Need Consistent definitions
- “No *quantitative data indicating there is a shortage* of EMTs or paramedics”
- Little data showing a relationship between EMS workforce factors and patient outcome
- Qualitative evidence suggests that retaining workers is challenge
- Lack of data inhibits EMS workforce planning

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How many clinicians?

- Somewhere between 250,000 and 1 million!

Quick Facts: EMTs and Paramedics

2022 Median Pay	\$26,889 per year \$17.78 per hour
Typical Entry-Level Education	Postsecondary nondegree award
Work Experience in a Related Occupation	See How to Become One
On-the-Job Training	None
Number of Jobs, 2022	261,000
Job Outlook, 2022-31	7% (As fast as average)
Employment Change, 2022-31	17,300

Bureau of Labor Statistics
261,000

2020 NATIONAL EMERGENCY MEDICAL SERVICES ASSESSMENT

Table 29
Total # of Responding Bureaus

	Mean	Median	Min	Max	Total
34	19,497	12,129	110	91,256	1,052,842

National Assessment
1,052,842

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EMT WAGES ARE AN EMERGENCY

The Pay Is Just Not Enough: EMTs Are Working Multiple Jobs Just to Make Ends Meet

Local EMTs demand raise, better working conditions

Why EMTs, paramedics don't get paid enough

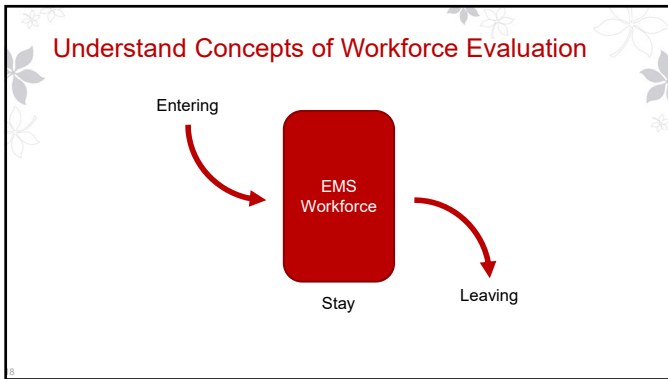
Improve Salaries For EMS Workers

The Low-Pay Lowdown

Study: Calif. EMS Providers Struggle with Low Pay, Poor Working Conditions

Low Pay for EMS is A Part of National Norm

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Entering the Workforce

- Starts when someone applies for a program, they are now part of "Possible EMS professionals"
- They can leave this process in a couple ways:
 - Do not complete training program (attrition from program)
 - Do not attain certification (not minimally competent)

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2018 CoAEMSP Annual Report

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    graph TD
      A[Enrolled in Programs  
17,442] --> B[Completed program, eligible for exam  
13,562]
      A --> C[Attrition  
Did not complete training  
3,840]
      B --> D[Passed exam  
11,835]
      B --> E[Not Minimally Competent  
Did not pass exam  
1,747]
  
```

- 78% of students graduated from paramedic programs
- 87% attained Certification to Practice
- Attrition is a large challenge in Entry into the field

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Leaving the Workforce

- This is the true number of EMS professionals who leave the workforce
- This is challenging to measure, since many leaving takes many forms:
 - Leaves the workforce for different career
 - Leaves the workforce but maintains a "card"
 - Leaves a state to go somewhere else
 - Leaves an agency for another

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Turnover Rates (Overall!)

**THE LONGITUDINAL STUDY OF TURNOVER AND THE COST OF TURNOVER
IN EMERGENCY MEDICAL SERVICES**

P. Daniel Patterson, PhD, MPH, Cheryl B. Jones, PhD, RN, Michael W. Hubble, PhD, MBA,
NREMT-P, Matthew Carr, BS, NREMT-P, Matthew D. Weaver, BS, NREMT-P, John Engberg, PhD,
Nicholas Castle, PhD

Followed 40 EMS agencies over a 6-month period with internet, telephone, and on-site data collection methods

Weighted median annual **turnover rate = 7.5%** (IQR: 5.2%, 10.8%)

PREHOSPITAL EMERGENCY CARE 2010;14:209-221

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As a follow up....

- Evaluated intention to leave EMS in 1 year
 - 6% within 1 year (Patterson et. al. J Allied Health 2009: 38, e84-e91)
 - 6% within 1 year
 - 27% within 5 years (Rivard et. al. PEC 2020: 24(5), 657-664)

Types of services employed were:
38-41% fire, 22-23% Private, 12-14% governmental, 9-12.7% hospital

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Most recently, agency level evaluation

- Quantitative analysis by AAA surveyed
 - 119 agencies (RR=17%) with leadership responding
 - Representing private (66%) and public (33%) EMS

Turnover rates (2018)

Occupation	Unweighted Average Turnover		
	Overall Turnover	Voluntary Turnover	Involuntary Turnover
Full-time EMT	25%	15%	4%
Part-time EMT	30%	27%	3%
Full-time Paramedic	24%	21%	3%
Part-time Paramedic	30%	28%	1%
Supervisor	15%	9%	4%

Turnover rates (2021, 2019)

Occupation	Weighted Average Turnover		
	Overall Turnover	Voluntary Turnover	Involuntary Turnover
Full-time EMT	24%	20%	4%
Part-time EMT	33%	28%	6%
Full-time Paramedic	15%	12%	2%
Part-time Paramedic	27%	23%	3%
Supervisor	9%	7%	2%
Dispatch	21%	17%	4%

2021-AAA-EMS-Turnover-Study.pdf(ambulance.org)

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Leaving the Workforce

- We know that the rate varies by service type
- Range appears to be from 5% to 24% per agency type
- Overall national samples demonstrated individual turnover to be approximately 7-8%

NEED MORE EVALUATIONS AND BETTER DATA!

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Multi-state Population Based Evaluation

- 9 states that required NREMT recertification
- Looked at EMS clinicians entering, leaving and staying

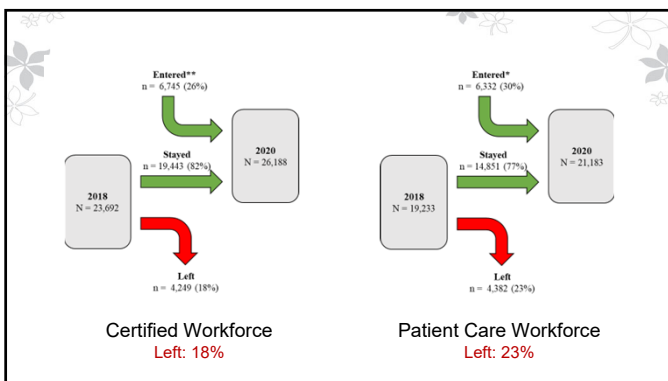
ORIGINAL RESEARCH
Emergency Medical Services

Evaluating changes in the emergency medical services workforce: A preliminary multistate study

Jordan D. Kurth PhD¹ | Jonathan R. Powell MPA, NRP^{1,2} | Christopher B. Gage MHS, NRP^{1,2} | Alix Delamare-Fauvel MD^{3,4} | Remie P. Crowe PhD, NREMT¹ | Rebecca E. Cash PhD⁵ | Ashish R. Panchal MD, PhD^{1,3,5}

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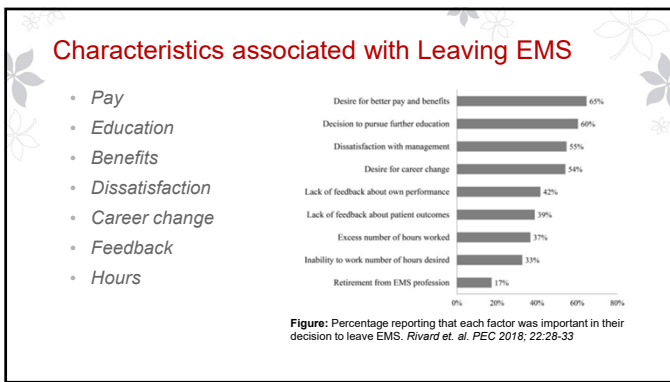


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What drives EMS clinicians to leave?

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Horizontal lines for notes



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Horizontal lines for notes

Work Burden on EMS Clinicians

- In one study, 75% of respondents report > 41 hours or more of average work hours.
- These same individuals report that:
 - 57% depend on overtime to make ends meet
 - 56% depend on more than one job to make ends meet
 - 71% depend on either OT or additional jobs

Rivard et. al. PEC 2020;24:657-664

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Horizontal lines for notes

Does this make people leave?

TABLE 3. The unadjusted and adjusted odds ratios of dissatisfaction with job and intentions of leaving the profession for respondents who depended on additional income to make ends meet

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*
Dissatisfied with EMS job	2.29 (1.97 – 2.66)	1.92 (1.64 – 2.44)
Intending to leave EMS within 1 year	1.49 (1.28 – 1.72)	1.32 (1.14 – 1.54)
Intending to leave EMS within 5 years	1.27 (1.18 – 1.37)	1.16 (1.07 – 1.25)

*Controlling for sex, age, race, certification level, agency type, employment status, and urbanicity.
Abbreviations- OR: Odds Ratio; CI: Confidence Interval.

Dependence on additional income to make ends meet leads to higher odds of dissatisfaction and intention to leave EMS

Rivard et. al. PEC 2020;24:657-664

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Changed since COVID...

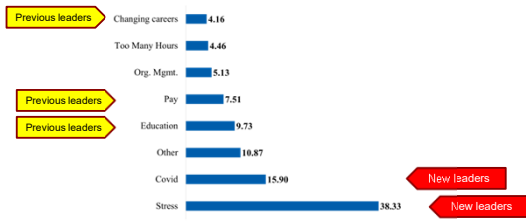


Figure 1. Reported reasons for leaving the EMS profession since COVID-19 (%). Abbreviations: Org. Mgmt., Organizational Management.

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Tied to Wellness and Mental Health

- Fatigue
- Injury
- Violence
- Burnout
- Suicide

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Fatigue in EMS

- We recognize poor sleep quality and fatigue are common in EMS.
- Patterson et. al. demonstrated an association on fatigue with injury and adverse events
- Additionally, 55% EMS professionals were fatigued

FIGURE 2 , Crude and cluster/confounding-adjusted odds of safety outcomes associated with poor sleep and fatigue. Adjusted odds ratios (ORs) are from Table 3. These ORs were adjusted for clustering within agencies and confounding. AE = adverse event; CI = confidence interval.

Patterson et. al. PEC 2012;16:1, 86-97

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Injury

- NIOSH uses the National Electronic Injury Surveillance System (NEISS-Work) that identifies injuries treated in the participating hospitals from admissions information and ED chart review by a records abstraction.

Table 1: Demographics of injured EMS workers treated in US hospital emergency departments, 2019

	Number of injuries	95% confidence interval	Percent
Total	21,500	(13,400, 29,600)	100
Sex			
Male	12,600	(7,500, 17,700)	58
Female	9,000	(5,200, 12,800)	42

3-4% based on population range of 500k - 700k providers

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Injury

- Cross-sectional evaluation of EMS professionals (n=13,218) and their reported injuries on the job (all types)
 - Injury rate of **27%** in past 12 months.
 - Includes back (62%) and needlesticks (6%)
- Odds of injury decreased when agencies had:
 - lifting policies in place (OR=0.73),
 - lift training (OR=0.74) or
 - always using a powered stretcher (OR = 0.87)

Powell et. al. 2021 PEC, 25:1, 125-170

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Violence

- Estimates of career prevalence of violence range from 57-93% in EMS professionals reporting experiencing an act of verbal or physical violence. (*Gormley et. al. PEC 2016: 20(4):439*).
- This was mirrored in a Canadian study (75%)(*Bigham PEC 2014;18(4), 489*)

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Violence

- Recent, cross-sectional evaluation of EMS professionals (n=13,218) and their reported **64%** of EMS professionals experience occupational violence.

Table 2. Types of violence experienced by EMS providers reporting occupational violence, (64%, n=8,444).

Type(s) of Violence Experienced	Frequency (%)
Cursing	8,288 (97.6%)
Punching	3,687 (43.8%)
Spitting	3,290 (39.1%)
Biting	1,054 (12.7%)
Struck with an object	1,076 (12.9%)
Stabbing + Shooting	299 (3.6%)

Powell et. al. 2021 PEC, 25:1, 125-170

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Burnout

- High prevalence of burnout in EMS professionals
- National sample of 10,540 EMS professionals.
- Effectuated in many dimensions from personal to work related and patient-related.

Burnout Dimension	EMT (%)	Paramedic (%)
Personal*	24.9%	38.3%
Work-Related*	19.3%	30.1%
Patient-Related*	5.4%	14.4%

*p<.05

Crowe et. al. 2018; 22(2), 229-236

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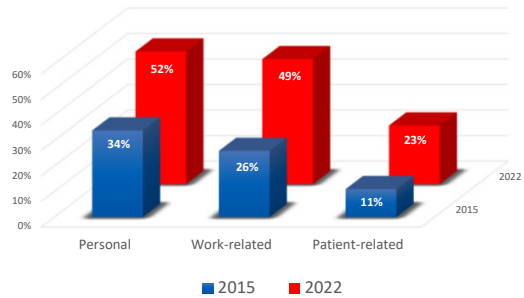
Burnout negatively impacts EMS workforce

TABLE 3. Association between dimensions of burnout and key factors that negatively impact the EMS workforce

		Odds Ratio (95% CI)	p-value
Likely to Leave EMS Job within Next 12 Months			
Personal burnout ¹	✓	2.45 (1.95-3.06)	<0.001
Work-related burnout ²		3.37 (2.67-4.26)	<0.001
Patient-related burnout ³		2.38 (1.74-3.26)	<0.001
Likely to Leave EMS Profession within Next 12 Months			
Personal burnout ¹	✓	2.70 (1.94-3.74)	<0.001
Work-related burnout ²		3.43 (2.47-4.75)	<0.001
Patient-related burnout ³		3.69 (2.42-5.63)	<0.001
10 or More Sickness Absence Days in Last 12 Months			
Personal burnout ¹	✓	2.32 (1.39-3.87)	0.001
Work-related burnout ²		2.30 (1.39-3.83)	0.001
Patient-related burnout ³		2.35 (1.25-4.42)	0.008

¹Adjusted for: provider level, years of EMS experience, sex, agency type, and weekly call volume.
²Adjusted for: provider level, years of EMS experience, agency type, and weekly call volume.
³Adjusted for: provider level, sex, weekly call volume, and education level.

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Associated with Leaving

	Odds Ratio (95% CI)	p-value
10 or More Sickness Absence Days in Last 12 Months	1.96 (1.32-2.93)	<0.001
Likely to Leave EMS Profession within Next 12 Months	2.85 (2.01-4.05)	<0.001

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Suicide Risk

- Not many studies on EMS clinicians' risk of suicide from occupational exposure.
- We do know that fire fighters who have witnessed 1 or more deaths by suicide have an increased age adjusted odds of suicidal ideation (OR 1.71) or suicide attempts (OR 2.00).
- Firefighters with 12 or more suicide exposures had a lifetime suicide ideation rate of 61%

Stanley et. al. *J Affective Disord.* 2015;187, 163

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Suicide

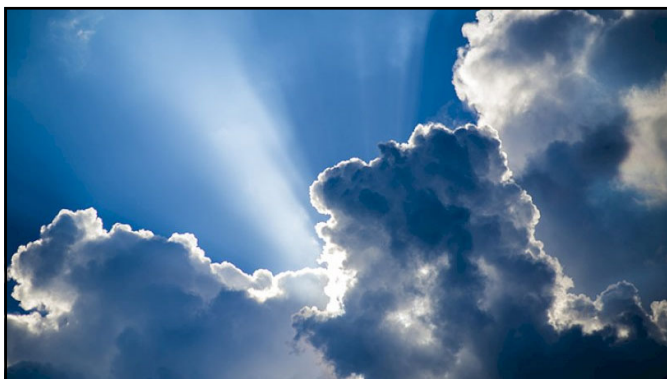
- Manual evaluation of Arizona death registry of all adults to identify records with an occupations that included an EMT certification.
- Mortality OR = 2.43 for EMT compared to non-EMT.

TABLE 1. Demographic and event characteristics between EMT and Non-EMT populations

	Non-EMT, N (%)	EMT, N (%)	Chi-square p-value
Total deaths	349,792	1,205	
Cause of death: Suicide	7,775 (2.2%)	63 (5.2%)	<0.0001
18-34	12,298 (8.5%)	102 (8.4%)	
35-54	36,194 (10.3%)	191 (15.8%)	
55-74	110,621 (31.6%)	381 (31.6%)	
>75	190,680 (54.5%)	531 (44.0%)	
Male	184,987 (52.8%)	1,127 (93.5%)	<0.0001
White non-Hispanic	280,766 (80.2%)	972 (80.6%)	

Vigil et. al. 2019; 23(3), 340-345

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You can have a positive impact!!

- Burnout varies by Agency
- Percent of respondents experiencing burnout by agency

EMS Agency (N=248)

Crowe et. al. 2020 JACEPOPEN 1; 6-16

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WE CAN MAKE A DIFFERENCE!

- Feedback from medical directors, participatory environment, supportive culture and training are PROTECTIVE!

Job resources	% (n)	Adjusted OR (95% CI)*
Performance feedback		
Medical director (Yes)	33.6 (425)	0.46 (0.34 - 0.61)*
Supervisor (Yes)	58.5 (740)	0.36 (0.28 - 0.47)*
Participatory environment		
Personal input is well received (Yes)	60.4 (764)	0.25 (0.20 - 0.33)*
Supportive environment		
Management support (Yes)	67.1 (848)	0.20 (0.15 - 0.27)*
Respect from supervisor (Yes)	87.0 (1101)	0.19 (0.13 - 0.28)*
Respect from co-workers (Yes)	93.3 (1178)	0.22 (0.13 - 0.36)*
Knowledge		
Adequate orientation (Yes)	58.5 (741)	0.36 (0.28 - 0.45)*
Adequate training (Yes)	67.6 (856)	0.35 (0.27 - 0.45)*

Crowe et. al. 2020 JACEPOPEN 1; 6-16

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Thank You

Questions?

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