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# Healing the Healer: Protecting Emergency Health Care Workers' Mental Health During COVID-19

Ambrose H. Wong, MD, MEd\*; Maria L. Pacella-LaBarbara, PhD; Jessica M. Ray, PhD; Megan L. Ranney, MD, MPH; Bernard P. Chang, MD, PhD

\*Corresponding Author. E-mail: [wongambrose@gmail.com](mailto:wongambrose@gmail.com), Twitter: [@ambrosehwong](https://twitter.com/ambrosehwong).

0196-0644/\$-see front matter

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<https://doi.org/10.1016/j.annemergmed.2020.04.041>

As an emergency clinician, I've always felt ready for any challenge. What I've seen over the last 6 weeks has shaken my core as a doctor and human being. Wave after wave of acutely ill patients come in, and we bear witness to human loss and tragedy on an unprecedented scale. There is an implicit assumption that, as emergency clinicians, we would be calm and unflappable on the front lines to meet any disaster, no matter how grave. It feels entirely different when I see healthy adults my own age bringing in their gravely ill parents who then come back themselves in respiratory arrest mere days later. We struggle over which patient to intubate because we are faced with rationing of limited ventilators. We reuse face masks that are meant to be disposable because our hospitals may run out of them next week. How can we survive in this "whole of society" crisis? I used to say that I could escape work once I left the hospital, but the disease and its impact follows me everywhere I go. The desolate streets and empty restaurants and my inability to see loved ones amplify my helplessness against this relentless invisible threat. Over the last 2 weeks, I have admitted 3 of my friends and fellow emergency clinicians, all relatively young and healthy, into our own hospital. We were just at a potluck 3 months ago, and now I was at the bedside resuscitating one of my friends. Could I have ever thought that one day I would be intubating my friend? And who is to say I won't be next?

—Emergency physician, New York, NY, April 2020

## AN UNPRECEDENTED EPIDEMIC WITH SIGNIFICANT IMPLICATIONS FOR MENTAL HEALTH

The World Health Organization declared the novel coronavirus disease 2019 (COVID-19) a public health emergency in January 2020.<sup>1</sup> In March, the organization further characterized the outbreak as a pandemic with increasing infection rates around the world and within the

United States.<sup>2</sup> In addition to the physical mortality and morbidity directly attributed to COVID-19, this pandemic has broad psychosocial and emotional influence.<sup>3,4</sup> Advancements in global connectedness, digital technology, and media coverage have amplified both the spread of the COVID-19 infection and the intensity of associated psychological fear.<sup>5</sup>

As front line health care workers in out-of-hospital and emergency department (ED) settings, we are particularly vulnerable to negative mental health effects from COVID-19.<sup>6-8</sup> Our clinical environments face relentless increases in patient volume and acuity while we experience unprecedented physical and psychological hardship. In addition, conflicting and rapidly changing information regarding personal protective equipment fuels our ongoing fears of exposure and uncertainty about our own safety in the workplace.<sup>9,10</sup> We are asked to comply with novel practices to conserve or reuse personal protective equipment<sup>11,12</sup> that are not part of the routine practice of our specialty, without any explicit consent. Allowing such expectations to be promulgated without any discussion is not only dubious ethically but also could be a major impediment to the care for future patients as physicians become sick or die as a result of ignoring these violations. Although many of us accept the increased risk of infection as part of our chosen profession, some may have concerns about family transmission or feel pressure to comply because of fear of losing their job, desire to be part of the team, and altruistic goals of caring for patients in need.<sup>13</sup>

As a result of these issues, the COVID-19 crisis has shaken even the most battle hardened of our ranks. The unique paradox of simultaneous global digital interconnectedness and social and physical isolation that mark this epidemic has shifted our normal systems of coping. Across the world, we as frontline health care workers are being challenged both to grapple individually with our emotions and to work collectively to support resilience among our colleagues during this historic event.

## SIMILARITIES TO AND DIFFERENCES FROM PREVIOUS PANDEMICS

To help guide us, we can draw on lessons learned in previous pandemics and disasters regarding health care worker mental health.<sup>14</sup>

Many of us across the country have already moved through the phase of “anticipatory traumatic reactions,” a future-focused form of distress and grief that has been documented for frontline caregivers in previous pandemics.<sup>15</sup> These reactions reflect a sense of fearful waiting, or even terror, about what the future may hold for us while an unfamiliar and uncomfortable quiet fills the halls.<sup>16</sup> Acute stress disorder and associated symptoms will also likely be common; up to 20% of health care workers had stress-related disorders immediately after the severe acute respiratory syndrome (SARS) epidemic and September 11, 2001.<sup>17,18</sup> These acute psychological symptoms may lead to the development of long-term mental health problems among a particularly vulnerable populations of health care workers, including those of us directly involved with treating or caring for the critically ill or diagnosing their diseases.<sup>6</sup> Posttraumatic stress disorder (PTSD)—characterized by greater than 1 month of intense intrusive or reexperienced thoughts (eg, nightmares or flashbacks), avoidance of trauma-related reminders, alteration of mood and cognition (eg, self-blame, negative views about oneself or the world), and heightened sense of threat<sup>19</sup>—is the most common long-term consequence of disaster exposure among health care workers and first responders.<sup>20,21</sup> We know that our risk for PTSD will increase with factors that are inherent to COVID-19, such as the intensity of exposure, the perception of danger, and the perception that the experience is unexpected or uncontrollable.<sup>22</sup> We also know that high rates of PTSD after disasters reflect our repeated direct and indirect traumatic stress during patient care.<sup>23,24</sup>

Previous research suggests that exposure to a disaster situation may also have positive psychological effects for some of us. Improved adaptability to stressful stimuli and posttraumatic growth (positive emotional and psychological changes in response to trauma) have been reported after major crises.<sup>25</sup> Factors associated with these positive responses among health care workers included adequate preparedness (eg, training and crisis preparation), greater social support (particularly familial and collegial support), and adaptive coping behaviors that involve acceptance rather than avoidance (eg, taking charge of the situation and viewing obstacles as positive challenges).<sup>26</sup>

Although the COVID-19 pandemic shares similarities with previous disasters and epidemics, it also has unique stressors. As health care workers on the front lines of

COVID-19 response, we in emergency medicine struggle with a uniquely high risk of asymptomatic transmission,<sup>27</sup> significant knowledge gaps about the viral pathophysiology,<sup>28</sup> and an unprecedented local and federal breakdown in supplies of personal protective equipment.<sup>11</sup> In regions of the country with the highest rates of infection and severe shortages in resources, we are exposed to difficult and often unprecedented decisions about rationing of care,<sup>29-31</sup> causing a sense of moral injury that often leads to clinician burnout.<sup>32</sup> Social distancing and other unique aspects of this pandemic further remove us from our normal coping mechanisms, leading to a perfect storm of psychosocial stress. Many of us are experiencing financial strain from paradoxical reductions in income at the moment of highest risk because of overall decreases in ED volume. Finally, COVID-19 is the first pandemic to occur in an age of deep digital integration, exposing us to constant streams of unfiltered clinical information and reinforcing sentiments of angst and despair.<sup>33</sup> Each of these elements potentially amplifies our anxiety, hopelessness, and fear, as well as our long-term risk of mental health consequences.<sup>6,34</sup> Already, Chinese health care workers involved in the COVID-19 response have reported high rates of distress (70%), depression (50%), anxiety (45%), and insomnia (34%); the highest risk factor for distress was being a frontline or emergency care health care worker.<sup>6</sup> These rates of health care worker distress are surpassing those reported after Ebola, SARS, and other pandemics.<sup>35,36</sup>

## WHAT CAN WE DO?

Strategies to counteract stressors and challenges during this outbreak will continue to evolve, but efforts to improve well-being and ensure our needs are met are rooted in psychological principles that remain unchanged. Specifically, stress management techniques that use principles of trauma-informed care have already been adapted by the National Center for PTSD to address the well-being of health care workers during COVID-19. Trauma-informed care recognizes the presence of trauma symptoms, common in this current epidemic, and promotes a culture of safety, empowerment, and healing by providing support services in a way that is accessible and appropriate to individuals who may have experienced trauma.<sup>37</sup> For example, brief training interventions, such as guided mindfulness exercises, can help us focus awareness on the present moment and include acceptance of internal experiences.<sup>38</sup> These cognitive interventions have been successful in reducing perceived stress in high-risk populations such as first responders<sup>39</sup> and resident physicians.<sup>40,41</sup> It is essential for our specialty to establish a

mechanism by which health care workers have early access to confidential, professional behavioral health resources for further support during this crisis.<sup>42</sup>

Digital and technologic platforms are an important adjunct to typical behavioral support, especially given the unique challenges of social distancing. Some mobile

applications may provide support in a more informal manner. Although further evidence is still necessary, we highlight the government-developed PTSD Coach (<https://mobile.va.gov/app/ptsd-coach>), a program based on cognitive behavioral therapy. Principles that has evidence from a randomized controlled study.<sup>43,44</sup> This application

**Table.** Abraham Maslow's hierarchy of needs<sup>46</sup> for frontline clinician stressors and potential solutions in the COVID-19 era.

Maslow's Level of Need	Examples	COVID-19 Concerns	Recommended Strategies
Level 1: physiologic	Food, sleep, physical and mental health	Extra workload demands around COVID-19 preparation and treatment Physical strain of protective equipment (dehydration, heat, exhaustion) Housing needs during isolation/quarantine periods Inadequate or disrupted sleep patterns Physical symptoms of COVID-19 disease for health care workers who contract the virus	<p><b>Individual</b></p> <p>Time for basic bodily care and refreshment/relaxation and stress-management breaks</p> <p>Avoid maladaptive behaviors with negative physiologic effects (eg, excessive alcohol, prescription drugs)</p> <p>Physical health and fitness (exercise programs, walking outside, mobile applications)</p> <p>Online mental health technologies (telepsychiatry, mobile applications, PTSD Coach)</p> <p><b>Administrative</b></p> <p>Provision of respite for staff members requiring isolation (eg, housing, child care)</p> <p>Supplementation of readily available water and nutritious food while on clinical duty</p> <p>Careful attention to individual work schedules to maximize rest and sleep between shifts</p> <p>Facilitation of testing and treatment for individuals who develop symptoms or become ill</p> <p>Virtual wellness and information town halls</p> <p>Early and confidential recognition, detection, and referral for treatment of psychiatric symptoms (eg, cognitive-behavioral therapy)</p>
Level 2: safety	Personal security, financial security, resources	Fears of personal safety around infection and lack of adequate personal protective equipment Lack of clarity around viral transmissibility (airborne versus droplet) Concerns for job security and potential debt, especially if an individual becomes infected with COVID-19 Feelings of being undersupported and underequipped to provide safe care	<p><b>Individual</b></p> <p>Peer consultation and supervision of PPE donning/doffing</p> <p><b>Administrative</b></p> <p>Alternative strategies to produce/distribute PPE (local manufacturers, donations, recycling)</p> <p>Clear and consistent messaging and shared decisionmaking with health care workers regarding infection rates, risk, and strategies to minimize risk</p> <p>Contingency plans for health care workers who cannot work during quarantine period or if they fall ill after contracting COVID-19 to provide job and financial security without negative consequences</p>
Level 3: love and belonging	Friendship, family, social connectedness	Possible separation from family members Risk of exposure to loved ones, especially those who are at high risk Physical isolation from friends, colleagues	<p><b>Individual</b></p> <p>Increase peer social support with regular contact with colleagues, family, and friends</p> <p>Seek out and share social support virtually</p> <p><b>Administrative</b></p> <p>Acknowledgment and affirmation of health care worker stressors and concerns</p> <p>Creation of specialized collaborative partnerships or teams focusing on COVID-19</p> <p>Online-based group support networks and mental health checks</p> <p>Resources for significant others and family members of health care workers to support their loved ones during epidemic</p>

**Table.** Continued.

Maslow's Level of Need	Examples	COVID-19 Concerns	Recommended Strategies
Level 4: esteem	Respect, status, self-determination/control, fairness	Pressure to serve as source of definitive information for nonmedical family and friends Constant pressure to maintain clinical acumen with increasing volume and acuity Ethical challenges in triaging resources (ventilators, staffing, bed capacity)	<b>Individual</b> Limit worries to actual (rather than anticipatory) threats Foster a spirit of patience, fortitude, tolerance, and hope Channel concerns through productive output (scholarly efforts, peer coaching, teaching, educational materials on COVID-19) <b>Administrative</b> Create specialized ethics teams/protocols for information and mentorship in decisionmaking Use patient-centered resources for difficult decisions Highlight exemplary behavior and celebrate individual contributions and efforts Create clear, transparent, fair, equitable, and accessible policies
Level 5: self-actualization	Desire for higher achievement	Tension between public health priorities and individual patient care Advocacy for larger systems changes to minimize effects of the epidemic	<b>Individual</b> Focus on efforts within one's individual control Accept situations one cannot change Contribute to productive efforts for change <b>Administrative</b> Sharing of information across institutions/systems Peer mentorship for clinical, administrative, and academic duties related to COVID-19 Creation of volunteering, innovation, and service opportunities to support response efforts (eg, creation of new devices/tools, clinical strategies)

PPE, Personal protective equipment.

offers PTSD symptom tracking and skills to cope with common distress reactions such as anger, anxiety, hopelessness, and sleep problems, and may be helpful to some of our distressed colleagues. Others may also wish to consider resources such as telepsychiatry, which is feasible and effective for a variety of mental health diseases ranging from depression to anxiety.<sup>45</sup> Training in mindfulness can easily be found online, and applications such as Headspace are now free to all US health care providers with a National Provider Identification number.

We also turn to one of the most well-known psychological theories, Abraham Maslow's hierarchy of needs,<sup>46</sup> to illustrate a potential path forward based on established psychological principles (Table). It provides a hierarchic context for how individuals prioritize their needs, starting from the most fundamental (physiologic and safety) and progressing to more abstract and complex needs once more basic ones are met (love and belonging, esteem, and self-actualization). Many clinicians are finding solutions through a purposeful focus on positive and adaptive behaviors that address each of our needs in Maslow's hierarchy. Taking walks outdoors as the weather becomes warmer, maintaining sleep and exercise schedules, and reconnecting with friends and family can help our

bodies feel whole. These simple actions also help us overcome feelings of social isolation, restlessness, and loneliness. As more basic needs are adequately met, we may be able to channel some of our frustrations with the pandemic into constructive efforts to combat the outbreak. For example, some of our colleagues are synthesizing up-to-date knowledge about disease management or creating innovative solutions for equipment and clinical work flow.

We also suggest established strategies that our clinical leaders may be able to use to help health care workers reduce distress.<sup>47</sup> Top among these is listening and validating our legitimate anxiety and fears, giving us an opportunity for direct input and shared decisionmaking regarding policy changes that affect our level of risk and workload at the bedside. We encourage our leaders to develop strategies that can serve as a foundation for us to improve needs higher in Maslow's hierarchy. For example, careful attention to health care workers' work schedules will not only address physiologic needs but also allow for sufficient rest, thereby strengthening our meaningful work, our esteem, and our sense of self-actualization. Ultimately, these interventions require that we unite as a community to build broad and structured approaches that support all emergency personnel during this critical time of need.



## CONCLUSION: SETTING A PATH FORWARD

Emergency medicine is society's safety net, serving patients irrespective of socioeconomic background, medical complexity, or disease severity. As emergency personnel and frontline health care workers, we have become vulnerable to the behavioral and mental health fallout resulting from this global crisis while straining to maintain this safety net and serve our patients. Efforts to reduce or prevent our acute and chronic stress while promoting positive, adaptive ways to face our ongoing challenges may seem impossible, but experiences in previous epidemics suggest that we can successfully enhance our resilience.

We implore our specialty to unify in acknowledging that none of us are unique in experiencing this distress. The emotional and behavioral reactions we may experience during this crisis (eg, difficulty sleeping, anger, sadness, abandonment, social withdrawal) are also being shared by our entire community. Acknowledgement is necessary, but not sufficient. We must also address root causes. Our stressors range from basic protection (eg, adequate personal protective equipment) to complex psychosocial needs (eg, reintegration with broader society, interactions with family and friends); each of these deserves attention. Finally, to best help ourselves and our colleagues, we need to act now. This pandemic has already begun to change our thoughts and behaviors and has potentially caused damage to members of our profession (through infection, residual health problems, and mental health effects); its aftereffects will likely be broad and deep.

The phrase "physician, heal thyself" has been used as a proverb to allude to the notion of attending to one's own illness before attending to that of others,<sup>48</sup> but in this age of COVID-19, "healing the healer" rings true as well. It is a call to recognize and support the efforts of the emergency medicine community. The consequences of overlooking these stressors could not be direr. Not only are we protecting our lives and those of our patients but also we fight to protect the ability of our specialty to remain the tireless stewards of the public safety net both during this crisis and for future generations.

*The authors acknowledge Lorna Breen, MD, and all other frontline heroes who have fallen during our battle against the COVID-19 epidemic.*

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*Supervising editor:* David L. Schriger, MD, MPH. Specific detailed information about possible conflict of interest for individual editors is available at <https://www.annemergmed.com/editors>.

*Author affiliations:* From the Department of Emergency Medicine, Yale School of Medicine, New Haven, CT (Wong, Ray); the

Department of Emergency Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA (Pacella-LaBarbara); the Department of Emergency Medicine, Alpert Medical School of Brown University, Providence, RI (Ranney); and the Department of Emergency Medicine, Columbia University Irving Medical Center, New York, NY (Chang).

*Publication dates:* Received for publication April 6, 2020. Revisions received April 15, 2020, and April 20, 2020. Accepted for publication April 28, 2020.

*Authorship:* All authors attest to meeting the four ICMJE.org authorship criteria: (1) Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND (2) Drafting the work or revising it critically for important intellectual content; AND (3) Final approval of the version to be published; AND (4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

*Funding and support:* By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see [www.icmje.org](http://www.icmje.org)). Dr. Wong is supported by the Robert E. Leet and Clara Guthrie Patterson Trust Mentored Research Award and the National Center for Advancing Translational Science (1 KL2 TR001862-01). Dr. Pacella-LaBarbara is supported by the National Institute of Arthritis and Musculoskeletal Skin Diseases (1 K01 AR073300-01A1). Dr. Ranney is supported by the Eunice Kennedy Shriver National Institute of Child Health & Human Development (1 R01 HD093655-01). Dr. Chang is supported by the National Heart, Lung, and Blood Institute (1 R01 HL146911-01A1 and 5 R01 HL141811-02).

## REFERENCES

- Lai CC, Shih TP, Ko WC, et al. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. *Int J Antimicrob Agents*. 2020;55:105924.
- Gates B. Responding to Covid-19: a once-in-a-century pandemic? *N Engl J Med*. 2020;382:1677-1679.
- Wang C, Pan R, Wan X, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health*. 2020;17:E1729.
- Wong JEL, Leo YS, Tan CC. COVID-19 in Singapore: current experience: critical global issues that require attention and action. *JAMA*. 2020;323:1243-1244.
- Chiolero A. Covid-19: a digital epidemic. *BMJ*. 2020;368:m764.
- Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. 2020;3:e203976.
- Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. 2012;172:1377-1385.
- Mull CC, Bowman WR. A call to restore your calling: self-care of the emergency physician in the face of life-changing stress: part 5 of 6: physician burnout. *Pediatr Emerg Care*. 2020;36:e25-e29.
- Hoe Gan W, Wah Lim J, Koh D. Preventing intra-hospital infection and transmission of COVID-19 in healthcare workers. *Saf Health Work*. 2020; <https://doi.org/10.1016/j.shaw.2020.03.001>.

10. Ong SWX, Tan YK, Chia PY, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *JAMA*. 2020;323:1610-1612.
11. Livingston E, Desai A, Berkwitz M. Sourcing personal protective equipment during the COVID-19 pandemic. *JAMA*. 2020; <https://doi.org/10.1001/jama.2020.5317>.
12. Bauchner H, Fontanarosa PB, Livingston EH. Conserving supply of personal protective equipment: a call for ideas. *JAMA*. 2020; <https://doi.org/10.1001/jama.2020.4770>.
13. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. *JAMA*. 2020;323:1439-1440.
14. Lancee WJ, Maunder RG, Goldbloom DS. Coauthors for the Impact of SARS Study. Prevalence of psychiatric disorders among Toronto hospital workers one to two years after the SARS outbreak. *Psychiatr Serv*. 2008;59:91-95.
15. Davis EL, Deane FP, Lyons GCB, et al. Is higher acceptance associated with less anticipatory grief among patients in palliative care? *J Pain Symptom Manage*. 2017;54:120-125.
16. Hopwood TL, Schutte NS, Loi NM. Stress responses to secondary trauma: compassion fatigue and anticipatory traumatic reaction among youth workers. *Soc Sci J*. 2019;56:337-348.
17. Biggs QM, Fullerton CS, Reeves JJ, et al. Acute stress disorder, depression, and tobacco use in disaster workers following 9/11. *Am J Orthopsychiatry*. 2010;80:586-592.
18. Bai Y, Lin CC, Lin CY, et al. Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatr Serv*. 2004;55:1055-1057.
19. Fullerton CS, Ursano RJ, Wang L. Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers. *Am J Psychiatry*. 2004;161:1370-1376.
20. Neria Y, DiGrande L, Adams BG. Posttraumatic stress disorder following the September 11, 2001, terrorist attacks: a review of the literature among highly exposed populations. *Am Psychol*. 2011;66:429-446.
21. Armagan E, Engindeniz Z, Devay AO, et al. Frequency of post-traumatic stress disorder among relief force workers after the tsunami in Asia: do rescuers become victims? *Prehosp Disaster Med*. 2006;21:168-172.
22. Shalev A, Liberzon I, Marmar C. Post-traumatic stress disorder. *N Engl J Med*. 2017;376:2459-2469.
23. Zimering R, Gulliver SB, Knight J, et al. Posttraumatic stress disorder in disaster relief workers following direct and indirect trauma exposure to Ground Zero. *J Trauma Stress*. 2006;19:553-557.
24. Chang B. Can hospitalization be hazardous to your health? a nosocomial based stress model for hospitalization. *Gen Hosp Psychiatry*. 2019;60:83-89.
25. Brooks S, Amlot R, Rubin GJ, et al. Psychological resilience and post-traumatic growth in disaster-exposed organisations: overview of the literature. *BMJ Mil Health*. 2020;166:52-56.
26. Brooks SK, Dunn R, Amlot R, et al. Social and occupational factors associated with psychological wellbeing among occupational groups affected by disaster: a systematic review. *J Ment Health*. 2017;26:373-384.
27. Bai Y, Yao L, Wei T, et al. Presumed asymptomatic carrier transmission of COVID-19. *JAMA*. 2020;323:1406-1407.
28. Cascella M, Rajnik M, Cuomo A, et al. *Features, evaluation and treatment coronavirus (COVID-19)*. Treasure Island, FL: StatPearls Publishing; 2020.
29. Emanuel EJ, Persad G, Upshur R, et al. Fair allocation of scarce medical resources in the time of Covid-19. *N Engl J Med*. 2020; <https://doi.org/10.1056/NEJMs2005114>.
30. White DB, Lo B. A framework for rationing ventilators and critical care beds during the COVID-19 Pandemic. *JAMA*. 2020;323:1773-1774.
31. Rosenbaum L. Facing Covid-19 in Italy: ethics, logistics, and therapeutics on the epidemic's front line. *N Engl J Med*. 2020.
32. Dean W, Talbot S, Dean A. Reframing clinician distress: moral injury not burnout. *Fed Pract*. 2019;36:400-402.
33. Depoux A, Martin S, Karafillakis E, et al. The pandemic of social media panic travels faster than the COVID-19 outbreak. *J Travel Med*. 2020;27:taaa031.
34. Dong L, Bouey J. Public mental health crisis during COVID-19 pandemic, China. *Emerg Infect Dis*. 2020; <https://doi.org/10.3201/eid2607.200407>.
35. Shultz JM, Baingana F, Neria Y. The 2014 Ebola outbreak and mental health: current status and recommended response. *JAMA*. 2015;313:567-568.
36. Chua SE, Cheung V, Cheung C, et al. Psychological effects of the SARS outbreak in Hong Kong on high-risk health care workers. *Can J Psychiatry*. 2004;49:391-393.
37. Fischer KR, Bakes KM, Corbin TJ, et al. Trauma-informed care for violently injured patients in the emergency department. *Ann Emerg Med*. 2019;73:193-202.
38. Smith SA. Mindfulness-based stress reduction: an intervention to enhance the effectiveness of nurses' coping with work-related stress. *Int J Nurs Knowl*. 2014;25:119-130.
39. Joyce S, Shand F, Lal TJ, et al. Resilience@Work mindfulness program: results from a cluster randomized controlled trial with first responders. *J Med Internet Res*. 2019;21:e12894.
40. Goldhagen BE, Kingsolver K, Stinnett SS, et al. Stress and burnout in residents: impact of mindfulness-based resilience training. *Adv Med Educ Pract*. 2015;6:525-532.
41. Minichiello V, Hayer S, Gillespie B, et al. Developing a mindfulness skills-based training program for resident physicians. *Fam Med*. 2020;52:48-52.
42. Tatebe LC, Siva NR, Pekarek S, et al. Heroes in crisis: trauma centers should be screening for and intervening on post-traumatic stress in our emergency responders. *J Trauma Acute Care Surg*. 2020; <https://doi.org/10.1097/TA.0000000000002671>.
43. Kuhn E, Greene C, Hoffman J, et al. Preliminary evaluation of PTSD Coach, a smartphone app for post-traumatic stress symptoms. *Mil Med*. 2014;179:12-18.
44. Ruzek JI, Kuhn E, Jaworski BK, et al. Mobile mental health interventions following war and disaster. *Mhealth*. 2016;2:37.
45. Ruskin PE, Silver-Aylaian M, Kling MA, et al. Treatment outcomes in depression: comparison of remote treatment through telepsychiatry to in-person treatment. *Am J Psychiatry*. 2004;161:1471-1476.
46. Benson SG, Dundis SP. Understanding and motivating health care employees: integrating Maslow's hierarchy of needs, training and technology. *J Nurs Manag*. 2003;11:315-320.
47. Hobfoll SE, Watson P, Bell CC, et al. Five essential elements of immediate and mid-term mass trauma intervention: empirical evidence. *Psychiatry*. 2007;70:283-315; discussion 6-69.
48. George S, Hanson J, Jackson JL. Physician, heal thyself: a qualitative study of physician health behaviors. *Acad Psychiatry*. 2014;38:19-25.