



# Burnout and Moral Distress Among Frontline Clinicians During the COVID-19 Pandemic

SUMMER | 2021

*CHEST Clinical Perspectives*™

## Introduction

The COVID-19 pandemic presented enormous challenges to the American health care system, and prioritizing the well-being of frontline clinicians is paramount. Before the pandemic, nearly half of US physicians reported experiencing burnout,<sup>1</sup> with pulmonologists reporting a rate of 41%.<sup>2</sup> The preexisting widespread nature of this phenomenon underscores the urgency needed to address the psychological and emotional needs of frontline clinicians<sup>3</sup> as the pandemic continues nearly 18 months later.

Burnout was first described nearly 45 years ago,<sup>4,5</sup> and is the psychiatric outcome of extended exposure to a corrosive work environment.<sup>6</sup> Professionals experiencing burnout are exhausted emotionally and physically and may feel ineffective in their work.<sup>6</sup> People experiencing burnout may also experience depersonalization, a sense of lost identity, and a disconnection from their own thoughts and feelings.<sup>6,7</sup> Research clearly shows that when a health care provider (HCP) experiences burnout, the quality of patient care declines.<sup>6,8,9</sup>

Moral distress is a more recently described phenomenon that is closely related to burnout. Moral distress was first identified in the 1990s and emerged from the field of nursing. It is defined as being in a situation where a clinician knows the right action to take but faces a series of constraints in executing that action.<sup>10</sup> These constraints may include the following situations<sup>11</sup>:

## Key Takeaways

- Two-thirds of respondents say the frequency of feeling burned out increased over the past 12 months.
- ICU physicians were more likely than other clinicians to report feelings of burnout.
- Frequency of feeling burnout was reported with lower rates among clinicians with more than 30 years clinical experience.
- Top three ranked factors for allocating scarce resources to a COVID-19 patient were patient's life expectancy prior to the pandemic, comorbidities, and age.
- Top two key values for determining scarce resource allocation were saving the most lives and patient's life expectancy prior to the pandemic.
- Situations that led to the most moral distress included:
  - ◆ Conflict with families over providing care that is not in the patient's interest
  - ◆ Abusive patients/families that compromise care
  - ◆ Poor quality of care due to care team dysfunction
  - ◆ Participating in care that causes unnecessary suffering
  - ◆ Witnessing a provider offering false hope to family
- Belief they are doing something ethically wrong but lack the power to change it
- Belief they have relevant knowledge that goes unheard or unconsidered
- Inability to provide care in a way that meets professional standards
- Repetition of situations that cause moral distress
- Distress triggered by pressure or aggressiveness from patient/family; poor communication or inadequate collaboration among care team members; and care system constraints, such as inadequate staffing and/or pressure to reduce costs

In recent years, the field of health care has undergone a growing awareness of moral distress in the workplace more generally, beyond the sphere of nursing alone.<sup>11</sup> This is significant because moral distress is linked to clinician burnout<sup>12-14</sup> and job dissatisfaction that can lead to a desire to depart from a position.<sup>15-21</sup>

## Research Focus

In this special issue of *Clinical Perspectives*, CHEST is providing a preview of research undertaken by a team of clinicians and social scientists at the University of Minnesota to explore burnout and moral distress among HCPs in intensive care unit (ICU) and acute care settings during the COVID-19 pandemic. This is one of the first applications of the Measure of Moral Distress for Healthcare Providers (MMD-HP) scale that the authors know of as applied to American HCPs in a critical care setting and that includes ICU clinicians.<sup>11</sup> The MMD-HP was developed in 2019 as a revision of the widely used Moral Distress Scale-Revised (MDS-R).

The objective of this research is to understand the extent to which the burden of moral distress and burnout have affected front-line practitioners during the COVID-19 pandemic. Understanding and characterizing the phenomenon of moral distress across HCP provider and patient settings lays the groundwork for identifying future areas of research with the goal of mitigating moral distress via strategic interventions or systemic reforms. This report provides a preview of findings from a survey of CHEST members.

The University of Minnesota research team is preparing a manuscript for publication in a peer-reviewed journal to share this work more widely with the professional community.

## **METHODS**

CHEST conducted an online survey with pulmonary and critical care clinicians (n=315) sampled from the CHEST member database. Respondents were sent a link to a 67-item survey from CHEST to assess burnout and moral distress. Data were collected during March 3–April 2, 2021. Survey data are weighted by practice tenure to ensure representation as observed among the population of clinicians in the CHEST member database.

### **Use of a Validated Scale to Assess Moral Distress**

Measuring moral distress is a work in progress. In 2001, the first Moral Distress Scale (MDS) was developed with 38 items to measure the longitudinal and cumulative effect of moral distress in intensive care nurses.<sup>22</sup> This scale underwent its first major revision in 2010 to yield the MDS-R, which was shortened to 21 items but broadened in its application to six different versions covering all health care providers (HCPs) working in adult settings.<sup>17</sup> Multiple additional revisions incorporated parallel research into the root causes of moral distress that were not captured by the MDS-R and that folded the six MDS-R versions into just one.<sup>11</sup>

The latest version is the Measure of Moral Distress for Healthcare Professions (MMD-HP). It includes 27 items and differentiates between four root cause factors (eg, system level issues, patient level clinical issues, interpersonal team dysfunction, and breakdowns in a care team’s interactions with the patient or family).<sup>11</sup> Furthermore, it added items to identify the root cause of distress including excessive documentation requirements that interfere with patient care, compromised patient care due to lack of resources, and lack of administrative action. Adding these items narrowed previously reported gaps between moral distress measured in nurses and physicians.<sup>11</sup>

To measure the prevalence and impact of moral distress during the COVID-19 pandemic, the survey included a battery of experiential items adopted from a validated scale on moral distress among HCPs.<sup>11,22</sup> The scale was developed to assess a variety of factors that create and exacerbate feelings of moral distress, including powerlessness, not being heard, impossibility of tasks, constraints at multiple levels (patient/family, care team, administrative/systemic), and repeated encounters with these experiences.

The scale deployed in this survey to measure moral distress, as distinct from burnout, consists of a truncation of the original 27-item MMD-HP scale to just 22 items. The researchers obtained the full factor analysis for all 27 items on the MMD-HP scale and then identified the items that ranked highest in root causes relative to physicians. To shorten the survey, they selected the top five items in each cluster associated with system factors, clinical integrity, and team interaction. The researchers retained two additional items that were applicable to moral distress because they relate to the allocation of scarce resources for standards of care during clinical work under crisis. (These two items were “work with team members who do not treat vulnerable or stigmatized patients with dignity and respect” and “witness a violation of a standard of practice or a code of ethics and not feel sufficiently supported to report the violation.”) For each item, the respondents were asked how frequently they experienced a given situation; if they reported having experienced the situation, they were subsequently asked how distressing the situation was to them.

### **Statistical Analysis**

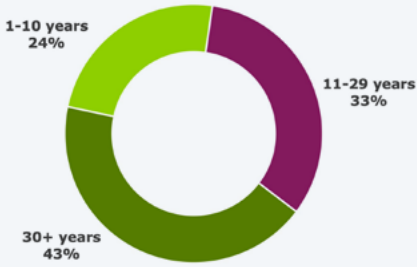
Descriptive statistics were used to assess distributions of the data across important demographic variables. Inferential statistics were used to assess differences in descriptive and behavioral measures, which were cross tabulated by practice setting data. Depending on data type, a two-tailed independent samples t-test and a chi-square test was used to test for statistical significance (where  $P < .1$  is considered statistically significant).

## **RESPONDENT AND PRACTICE PROFILES**

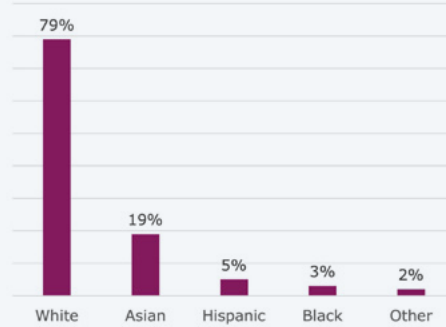
### **Respondent Profile**

Due to the weighting of the data, respondent tenure matches the population of pulmonary clinicians observed in the CHEST member data (fig. 1). Most respondents are white or Asian (fig. 2), and most are pulmonologists who work both in and out of the ICU (table 1). The respondent base also includes a representative mix of clinicians as characterized by age and US geographic region.

**Figure 1: Tenure in Practice**



**Figure 2: Race and Ethnicity**



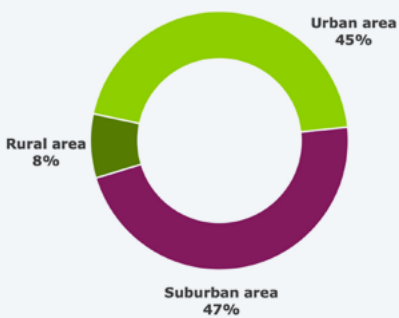
**Table 1: Area of Specialization**

Area of Specialization	Total
Pulmonologist in ICU	43%
Pulmonologist (non-ICU)	23%
Advanced practice professional	20%
Other ICU physician	6%
Respiratory therapist	8%

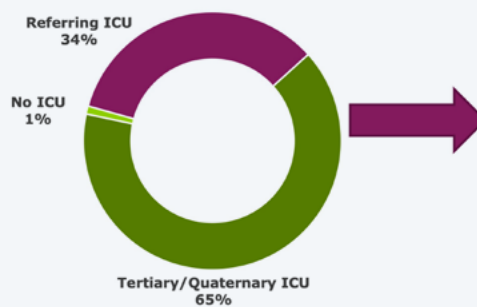
**Practice and Institutional Profile**

The majority of respondents report practicing in a metropolitan area, with a relatively even mix of urban and suburban institutions (fig. 3). Most (77%) report primarily working in an inpatient setting representing a mix of different institutional types spanning from academic medical centers to community hospitals with varying arrays of capability (fig. 4). Respondents earlier in their careers are more likely to be working at institutions that have a lower estimated share of Medicaid patients.

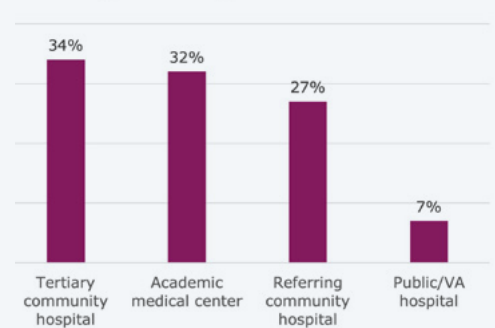
**Figure 3: Institution Setting**



**Figure 4: ICU Level**



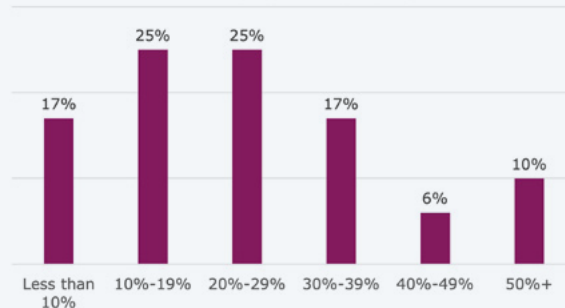
**Figure 5: Type of Institution**



The majority of respondents (65%) indicate their institution has a tertiary or quaternary-level ICU, whereas one-third (34%) report having a referring ICU (fig. 5). Half say their institution’s ICU has extracorporeal membrane oxygenation capability.

Two-thirds (64%) indicate their institution has a triage team or triage officer (fig. 6). This role is responsible for implementing crisis standards-of-care guidelines for allocating scarce resources to help relieve treating clinicians of the burden such decisions impose. Community-based hospitals with referral ICUs (37%) are more likely to report lacking a triage officer or team.

**Figure 6: Estimated Share of Medicaid Patients at Institution**

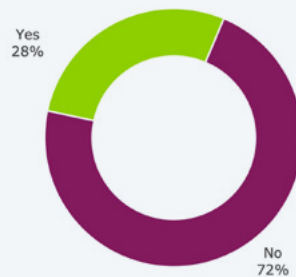


**DETAILED FINDINGS**

**Patient Care Experience and Clinician Burnout**

A quarter of respondents (28%) report having been directly involved in the decision to withdraw care from COVID-19 patients due to scarce resources at their institution (fig. 7).

**Figure 7: Experience Withdrawing Care to COVID-19 Patients Due to Scarce Resources**



Nearly one-third (30%) say they experience feelings of burnout, and one-quarter (23%) say they experience feeling more callous toward people on at least a weekly basis (fig. 8). However, key differences are noted among cross-sections of respondents related to the frequency of feeling burnt out. ICU physicians were more likely to report feeling burnt out than other clinicians. Furthermore, clinicians who were involved in the decision to withdraw care from a COVID-19 patient due to resource allocation issues were also more likely to report frequently feeling burnout than those not involved in such decisions.

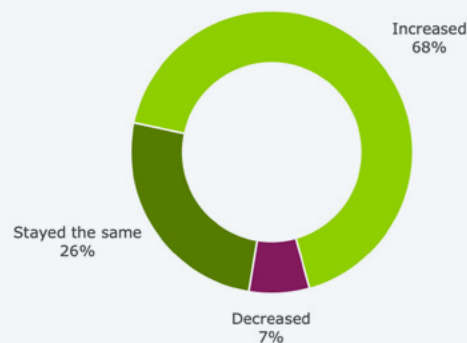
**Figure 8: Feeling Burned Out and More Callous Toward People**



Tenure also appears to play a large role in report of burnout. Respondents who have more than 30 years in clinical practice appear to be better equipped to deal with burnout—or are less likely to acknowledge it. The frequency of feeling burnt out was reported at lower rates among clinicians with more than 30 years of clinical experience. In contrast, respondents with tenure of 10 years or less were more likely to report feeling burnout, to report an increase in these feelings in the past year, and to report feeling more callous toward other people.

Providing care during the pandemic has played a significant role in elevating overall feelings of burnout among respondents. Two-thirds of respondents (68%) say the frequency of feeling burned out has increased over the course of the prior 12 months (fig. 9). This is especially true among ICU physicians (76%).

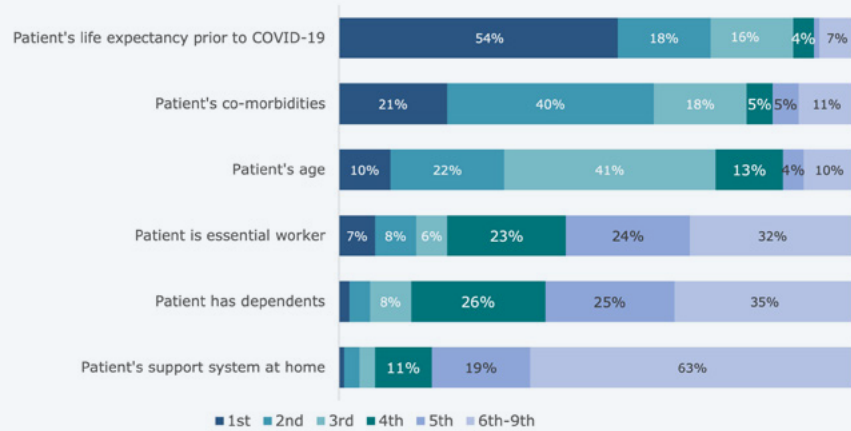
**Figure 9: Change in Feelings of Burn Out Since Onset of Pandemic**



**Priorities and Values for Allocating Limited Critical Care Resources During a Pandemic. Priorities for allocating resources.**

Respondents were asked to rank a series of factors based on how important they are in determining scarce critical care resource allocation during the COVID-19 pandemic. Overwhelmingly, the patient’s life expectancy before the pandemic was the top factor, ranked first by more than half of respondents (fig. 10).

**Figure 10: Ranking of Factors Most Important to Critical Care Resource Allocation During COVID-19**



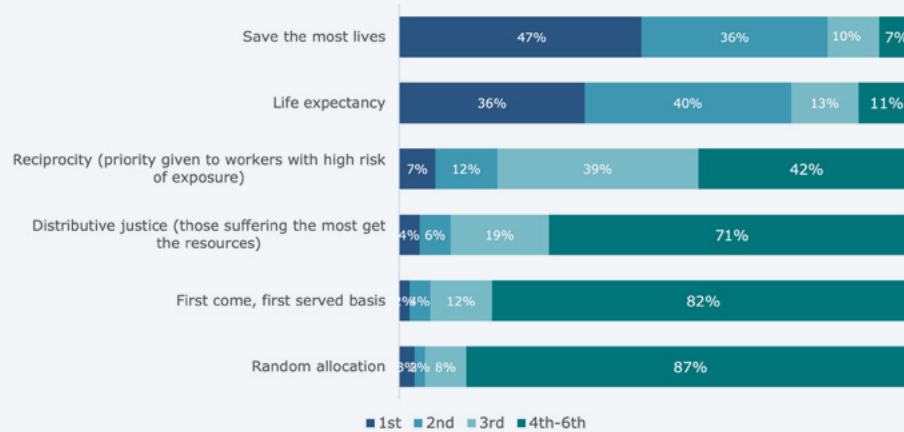
The patient’s comorbidities and age rounded out the top three factors. Other factors ranked considerably lower, including the patient’s status as an essential worker, presence of dependents, and the state of the patient’s support system at home. The patient’s living conditions, the attending physician’s relationship with the patient/family and the patient’s perceived responsibility for their infection consistently fell outside of the top five rankings.

**Influence of key values in scarce critical care resource allocation.**

Saving the most lives and life expectancy are the top two values cited, by a large margin, as influencers over critical care resource allocation during the COVID-19 pandemic (fig. 11). Reciprocity (giving priority to workers who have a high risk of exposure) is cited next most frequently. Distributive justice, first-come first-served, and random allocation are much less likely to be ranked within the top three values influencing resource allocation.

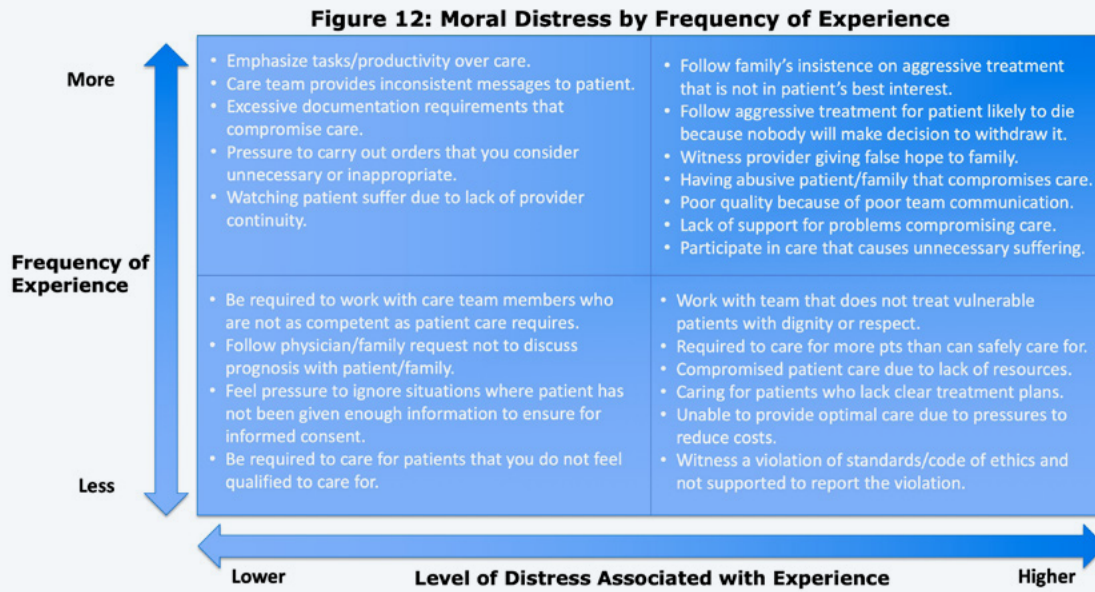


**Figure 11: Importance of Specific Values When Considering Allocation of Scarce Critical Care Resource During COVID-19**



### Clinician Experience with Moral Distress in Patient Care

Figure 12 plots the frequency of respondents experiencing situations of moral distress against the degree of distress caused by the experience. The experiences depicted in the upper right quadrant of the chart are the most problematic—they occur most frequently and cause the highest levels of distress among clinicians who experience them. Most of these issues are tied closely to direct patient/family encounters, including continuing unnecessary suffering, treating aggressively past the point of effectiveness, portraying false hope to the family, and dealing with abuse from patients and family members that negatively affects care. Other factors involve the care team (poor communication that negatively affects care) and systemic support (absence of support for addressing problems that compromise care).



Other situations occur less frequently but are a significant source of moral distress for providers when they do occur (fig. 12, lower right quadrant). They include team members who do not treat vulnerable patients with dignity or respect, excessive patient volume or lack of resources that compromise quality, absence of clear treatment plans, pressure to reduce costs at the expense of patient care, and lack of support for reporting standards/ethics violations.

A variety of situations occur with some degree of frequency but cause less distress for respondents (fig. 12, upper left quadrant). They include a focus on productivity, excessive documentation requirements, pressure to carry out orders that the provider feels are unnecessary, inconsistent communication to the patient, and lack of provider continuity. Finally, the lower left quadrant identifies experiences that are infrequent and less distressful. These include competency of care team members, family pressures regarding communication, and being required to care for patients with needs beyond the respondent's skill set.

**DISCUSSION**

The results of the survey conducted by CHEST indicate that most respondents experienced an increase in feelings of burnout and moral distress during the period of roughly March 2020 to March 2021.

Survey findings reveal that ICU physicians reported higher rates than clinicians working in any other settings. They also show that the most pervasive drivers of burnout and moral distress derived from three different nested spheres: patients and their families, care teams, and organizational system-level issues beyond the HCPs care unit; this is similar to findings from other studies of moral distress among HCPs.<sup>11</sup> Another key finding was the association of an HCP's tenure, with lower rates of burnout reported among clinicians with more than 30 years clinical experience.

Although the results revealed some geographic variation in terms of more burnout and moral distress reported in the South and West, this could be largely attributed to where COVID-19 hotspots were emerging at the time the survey was administered. In other words, geographic signals in the data were essentially a proxy for local epidemics, rather than meaningful geographic factors. The survey did not uncover wide differences in burnout or moral distress based on the institution type or share of Medicaid patients seen.

**Future Directions**

These findings raise questions for further research. First, how does the experience of HCP burnout and moral distress affect patient care? Research of both nurses and physicians links increasing feelings of burnout to declining quality of care.<sup>6,8,9</sup> Burnout is also linked to a loss of clinical empathy,<sup>23</sup> which is troubling because research shows that as clinical empathy increases, physician-reported error rates decline.<sup>24</sup>

Clinical empathy is a cornerstone for HCPs to listen to patients in a way that integrates cognitive and emotional empathy, and it aids in the HCP's ability to collect medical histories and resolve difficult conflicts with a patient. Likewise, the HCP's clinical empathy affects a patient's adherence to treatment protocols and their capacity to cope with bad news.<sup>6</sup> Therefore, burnout has a corrosive effect that negatively affects the HCP's ability to do their job and patients themselves.

Second, what is the mechanism leading to HCPs with tenures of 30 years or more reporting lower levels of burnout and moral distress? It would be intriguing to probe how HCPs with longer tenures deal with or acknowledge burnout. This is an especially interesting line of inquiry considering that ICU physicians tend to report the longest tenures, which would seem to imply that the most tenured ICU physicians experiencing the pandemic surge of COVID-19 patients reported lower levels of burnout.

It remains unclear whether those with longer tenures have developed effective coping mechanisms or simply fail to acknowledge burnout and report it. It is also possible that generational differences exist, as a pre-pandemic survey of physician burnout revealed that the Boomer generation reported a 39% burnout rate, while Generation X reported a significantly higher rate of 48%.<sup>2</sup>

If more tenured physicians have developed successful coping mechanisms, it would benefit other HCPs to be made aware of them. Likewise, if they are simply failing to recognize their own burnout, intervention is needed to support these individuals and prevent possible breakdowns in patient care, care teams, or even their own personal lives. Clearly, the relationship of tenure and physician burnout deserves further research.

Third, how should the systemic issues that lead to burnout and moral distress be addressed and mitigated? Health care administrators have a responsibility to foster supportive work environments and research shows that doing so mitigates moral distress to some degree.<sup>25</sup> For example, researchers developed a model rooted in psychotherapy to help HCPs cultivate resiliency and psychological well-being in hospital workers.<sup>3</sup> The National Academy of Medicine released strategies to support clinician's health and well-being during the pandemic,<sup>26</sup> but more structured strategies and support systems may be needed.

A recent paper in the nursing literature includes detailed recommendations aimed at leadership and managers for mitigating burnout and moral distress during COVID-19.<sup>27</sup> Physicians need a similar set of detailed guidelines specific to their job functions and work settings. Perhaps one of the lasting legacies of COVID-19 is that it has forced a recognition of the intrinsic value of investing in the mental health of HCPs combined with cultivating work environments that support clinicians during extended extenuating circumstances.

## Conclusion

Even as the pandemic appears to be declining in the US, long-term respiratory follow-up care is forecast to be needed by many patients living with lingering effects from COVID-19.<sup>28</sup> The drivers of burnout and moral distress identified in this survey may recede into the background somewhat once local surges of COVID-19 outbreaks decline and as vaccination rates increase. However, burnout and moral distress among HCPs relative to COVID-19 is not likely to disappear entirely because the situation of caring for patients due to lingering COVID-19 effects will likely continue for the foreseeable future.

Insights from future research will help mitigate the corrosive effects of burnout and moral distress. By extension, this research will invest in and protect the nation's valuable health resource of highly trained and educated frontline HCPs.

## REFERENCES

1. 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(18):1377-1385. doi:10.1001/archinternmed.2012.3199
2. Kane, L. Medscape National Physician and Suicide Report 2020: The Generational Divide. *Medscape.* January 15, 2020. Available at: <https://www.medscape.com/slideshow/2020-lifestyle-burnout-6012460#1>. Accessed June 4, 2021.
3. Rosen B, Preisman M, Hunter J, Maunder R. Applying psychotherapeutic principles to bolster resilience among health care workers during the COVID-19 pandemic. *Am J Psychother.* 2020;73(4):144-148. doi:10.1176/appi.psychotherapy.20200020
4. Freudemberger HJ. The staff burn-out syndrome in alternative institutions. *Psychotherapy.* 1975;12(1):73-82.
5. Niconchuk JA, Hyman SA. Physician burnout: achieving wellness for providers and patients. [published online ahead of print, 2020 Jul 3]. *Curr Anesthesiol Rep.* 2020;1-6. doi:10.1007/s40140-020-00401-w
6. Anzaldúa A, Halpern J. Can clinical empathy survive? Distress, burnout, and malignant duty in the edge of COVID-19. *Hastings Cent Rep.* 2021;51(1):22-27. doi:10.1002/hast.1216

## REFERENCES

7. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors related to physician burnout and its consequences: a review. *Behav Sci (Basel)*. 2018;8(11):98. Published 2018 Oct 25. doi:10.3390/bs8110098
8. Poghosyan L, Clarke SP, Finlayson M, Aiken LH. Nurse burnout and quality of care: cross-national investigation in six countries. *Res Nurs Health*. 2010;33(4):288-298. doi:10.1002/nur.20383
9. Dewa CS, Loong D, Bonato S, Trojanowski L. The relationship between physician burnout and quality of healthcare in terms of safety and acceptability: a systematic review. *BMJ Open*. 2017;7(6):e015141. Published 2017 Jun 21. doi:10.1136/bmjopen-2016-015141
10. Jameton A. Dilemmas of moral distress: moral responsibility and nursing practice. *AWHONNS Clin Issues Perinat Womens Health Nurs*. 1993;4(4):542-551.
11. Epstein EG, Whitehead PB, Prompahakul C, Thacker LR, Hamric AB. Enhancing understanding of moral distress: the measure of moral distress for health care professionals. *AJOB Empir Bioeth*. 2019;10(2):113-124. doi:10.1080/23294515.2019.1586008
12. Fumis RRL, Junqueira Amarante GA, de Fátima Nascimento A, Vieira Junior JM. Moral distress and its contribution to the development of burnout syndrome among critical care providers. *Ann Intensive Care*. 2017;7(1):71. doi:10.1186/s13613-017-0293-2
13. Sajjadi S, Norena M, Wong H, Dodek P. Moral distress and burnout in internal medicine residents. *Can Med Educ J*. 2017;8(1):e36-e43. Published 2017 Feb 24.
14. Neumann JL, Mau LW, Virani S, et al. Burnout, moral distress, work-life balance, and career satisfaction among hematopoietic cell transplantation professionals. *Biol Blood Marrow Transplant*. 2018;24(4):849-860. doi:10.1016/j.bbmt.2017.11.015
15. Allen R, Judkins-Cohn T, deVelasco R, et al. Moral distress among healthcare professionals at a health system. *JONAS Healthc Law Ethics Regul*. 2013;15(3):111-120. doi:10.1097/NHL.0b013e3182a1bf33
16. Dodek PM, Wong H, Norena M, et al. Moral distress in intensive care unit professionals is associated with profession, age, and years of experience. *J Crit Care*. 2016;31(1):178-182. doi:10.1016/j.jcrc.2015.10.011
17. Hamric, AB, CT Borchers, and EG Epstein. Development and testing of an instrument to measure moral distress in healthcare professionals. *AJOB Primary Research*. 2012;3(2):1-9. doi: 10.1080/21507716.2011.652337.
18. Hamric AB, Blackhall LJ. Nurse-physician perspectives on the care of dying patients in intensive care units: collaboration, moral distress, and ethical climate. *Crit Care Med*. 2007;35(2):422-429. doi:10.1097/01.CCM.0000254722.50608.2D
19. Hiler CA, Hickman RL Jr, Reimer AP, Wilson K. Predictors of moral distress in a US sample of critical care nurses. *Am J Crit Care*. 2018;27(1):59-66. doi:10.4037/ajcc2018968
20. Trautmann J, Epstein E, Rovnyak V, Snyder A. Relationships among moral distress, level of practice independence, and intent to leave of nurse practitioners in emergency departments: results from a national survey. *Adv Emerg Nurs J*. 2015;37(2):134-145. doi:10.1097/TME.000000000000060
21. Whitehead PB, Herbertson RK, Hamric AB, Epstein EG, Fisher JM. Moral distress among healthcare professionals: report of an institution-wide survey. *J Nurs Scholarsh*. 2015;47(2):117-125. doi:10.1111/jnu.12115
22. Corley MC, Elswick RK, Gorman M, Clor T. Development and evaluation of a moral distress scale. *J Adv Nurs*. 2001;33(2):250-256. doi:10.1046/j.1365-2648.2001.01658.x
23. Wilkinson H, Whittington R, Perry L, Eames C. Examining the relationship between burnout and empathy in healthcare professionals: A systematic review. *Burn Res*. 2017;6:18-29. doi:10.1016/j.burn.2017.06.003

24. West CP, Huschka MM, Novotny PJ, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA*. 2006;296(9):1071-1078. doi:10.1001/jama.296.9.1071
25. Hines SE, Chin KH, Glick DR, Wickwire EM. Trends in moral injury, distress, and resilience factors among healthcare workers at the beginning of the COVID-19 pandemic. *Int J Environ Res Public Health*. 2021;18(2):488. Published 2021 Jan 9. doi:10.3390/ijerph18020488
26. The National Academy of Medicine. Strategies for Health Care Leaders and Managers. Available at <https://nam.edu/initiatives/clinician-resilience-and-well-being/clinician-well-being-strategies-during-covid-19/>. Accessed on June 4, 2021.
27. The National Academy of Medicine. Strategies for Health Care Leaders and Managers. Available at <https://nam.edu/initiatives/clinician-resilience-and-well-being/clinician-well-being-strategies-during-covid-19/>. Accessed on June 4, 2021.
28. George PM, Barratt SL, Condliffe R, et al. Respiratory follow-up of patients with COVID-19 pneumonia. *Thorax*. 2020;75(11):1009-1016. doi:10.1136/thoraxjnl-2020-215314

## ADVISORY WORK GROUP



**Abbie Begnaud, MD, FCCP**  
Assistant Professor of Medicine  
University of Minnesota  
Pulmonary, Critical Care, Allergy  
and Sleep Medicine  
University of Minnesota Health  
Lung Cancer Screening Program



**Camille Robichaux, MD**  
Pulmonary and Critical Care Fellow  
University of Minnesota, Division  
of Pulmonary, Allergy, Critical Care  
and Sleep Medicine



**Anne C. Melzer, MD, MS**  
University of Minnesota Medical  
School  
Minneapolis VA Health Care  
System



**Brooke Cunningham, MD, PhD**  
University of Minnesota Medical  
School  
Assistant Professor, Department  
of Family Medicine and Community  
Health  
Co-Director, Diversity, Equity, and  
Inclusion Thread, Undergraduate  
Medical Education

## **ABOUT CHEST CLINICAL PERSPECTIVES™**

CHEST is the global leader in advancing best patient outcomes through innovative chest medicine education, clinical research, and team-based care. This includes connecting health care professionals to cutting-edge original research and a wide array of evidence-based guidelines through the journal *CHEST*®, while also serving as a resource for clinicians through year-round meetings, live courses, books, white papers, and mobile apps delivering content in the areas of pulmonary, critical care, and sleep medicine.

We've launched this series of *CHEST Clinical Perspectives* studies to cover compelling issues in chest medicine, on topics ranging from the use of biologics in treatment of patients with severe asthma, to the state of practice in tissue sampling and testing for NSCLC. An expert panel of thought leaders from the Mayo Clinic, Baylor College of Medicine, Medical University of South Carolina, Walter Reed Army Medical Center, and Emory University helps to guide the content of each study and lends rich expertise and perspectives in interpreting the results.



### ***CHEST Clinical Perspectives™ Series***

Through this series of groundbreaking white papers, you will find thorough summaries of insights and opinions gathered from key opinion leaders on the most critical issues in chest medicine.

If you would like to participate in future studies, please contact [CHESTAnalytics@chestnet.org](mailto:CHESTAnalytics@chestnet.org).

The American College of Chest Physicians ("CHEST") and its officers, regents, executive committee members, members, related entities, employees, representatives, and other agents (collectively, "CHEST Parties") are not responsible in any capacity for, do not warrant and expressly disclaim all liability for, any content whatsoever in any CHEST publication or other product (in any medium) and the use or reliance on any such content, all such responsibility being solely that of the authors or the advertisers, as the case may be. By way of example, without limiting the foregoing, this disclaimer of liability applies to the accuracy, completeness, effectiveness, quality, appearance, ideas, or products, as the case may be, of or resulting from any statements, references, articles, positions, claimed diagnosis, claimed possible treatments, services, or advertising, express or implied, contained in any CHEST publication or other product. Furthermore, the content should not be considered medical advice and is not intended to replace consultation with a qualified medical professional. Under no circumstances, including negligence, shall any CHEST Parties be liable for any DIRECT, INDIRECT, INCIDENTAL, SPECIAL or CONSEQUENTIAL DAMAGES, or LOST PROFITS that result from any of the foregoing, regardless of legal theory and whether or not claimant was advised of the possibility of such damages. The authors, editors, and publisher have exerted every effort to ensure that drug selection and dosage set forth in this text are in accordance with current recommendations and practice at the time of publication. However, in view of ongoing research, changes in government regulations, and the constant flow of information relating to drug therapy and drug reactions, the reader is urged to check the package insert for each drug for any change in indications and dosage and for added warnings and precautions. This is particularly important when the recommended agent is a new or an infrequently employed drug. Some drugs and medical devices presented in this publication may have US Food and Drug Administration (FDA) clearance for limited use in restricted research settings. It is the responsibility of the health-care provider to ascertain the FDA status of each drug or device planned for use in his or her clinical practice.

Copyright © 2021 by the American College of Chest Physicians®

*CHEST Clinical Perspectives™* is a trademark of the American College of Chest Physicians

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopied, recorded, otherwise—without the prior written permission of the copyright owner.