

# Missouri Medicine

The Journal of the Missouri State Medical Association

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January/February 2021



## Physician Health and Well-Being

2021: State of the Missouri's Health

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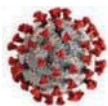
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The Journal of the Missouri State Medical Association - Since 1904

Volume 118 | Number 1 | January/February 2021

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## GUEST EDITOR

2021: The State of Public Health in Missouri  
by **Randall Williams, MD** .....4



## PERSPECTIVE

Mental Health from Medical School to Medical Practice: Finding a Path Forward  
by Stuart Slavin, MD, MEd.....7

Healthcare Provider Wellness in the Time of COVID and Beyond  
by **Lawrence M. Lewis, MD, Christopher R. Carpenter, MD, Randall Jotte, MD & Evan Schwarz, MD**.....13

## PRESIDENT'S FORUM

Light at the End of the Pandemic Tunnel?  
by **George J. Hruza, MD** .....18

## PERSPECTIVE

Marijuana's Impact on California: 2020 California's High Intensity Drug Trafficking Area Report.....22

Ellis Fischel, MD: Cancer Surgeon, Humanitarian and Innovator  
by **Arthur Gale, MD** .....30

## AS I SEE IT

Keep the Pharmacist, Cut the Middleman  
by Anne Eisenbeis, PharmD & Kristin Hoff.....32

Burnout in Physicians and the Role of Leadership  
by **Steven Zweig, MD**.....34



## SCIENCE OF MEDICINE | FEATURE SERIES

*Physician Health & Well-Being*  
Presented by the University of Missouri - Columbia School of Medicine & MU Health Care

Clinician and Researcher Well-Being: The Time is Now  
by **Stephen T. Keithahn, MD** & S. Craig Rooney, PhD .....36

The Missouri Physician and Health Professional Wellness Program: A Comprehensive Resource for Physician Wellness  
by William R. Carpenter, DO, James Wieberg, LPC & Heather Johns, LCSW.....41

The Pandemic's Toll—A Case for Clinician Support  
by Susan D. Scott, PhD, RN.....45

Creating Space for Well-Being in Medical School and Beyond  
by Stephanie Bagby-Stone, MD .....50

Are We Coping Well with COVID-19? A Study on Its Psycho-Social Impact on Front-line Healthcare Workers  
by Tinashe Maduke, MD, **James Dorroh, BA, Ambarish Bhat, MD, Armin Kravac, MD & Hariharan Regunath, MD**.....55

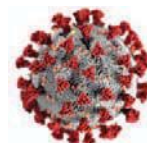


## SCIENCE OF MEDICINE FIRST LITERATURE REVIEW

The Influence of Religious Belief on Burnout in Medical Students  
by Megan Haghnegahdar, MD,  
Palash Sharma, **Kevin P. Hubbard, DO**  
& W. Abraham White, MD .....63

## SCIENCE OF MEDICINE | COVID-19

Magnesium and Vitamin D Deficiency as a Potential Cause of Immune Dysfunction, Cytokine Storm and Disseminated Intravascular Coagulation in COVID-19 Patients  
by James J. DiNicolantonio, PHarmD  
& **James H. O'Keefe, MD** .....68



COVID-19 Convalescent Plasma: From Donation to Treatment – A Systematic Review & Single Center Experience  
by **Michela M. Fabricius, BS** & Dima Dandachi, MD .....74

Lessons from Contact Tracing in Mid-Missouri  
by Lynelle Phillips, MPH, **Kelsey R. Knobbe, BS, Brittany N. Carson, BS, Lucas Jorgensen, BA, Sarah Truong, MD, Jenna Mitchell, MD & Albert L. Hsu, MD** .....81

## FROM YOUR ASSOCIATION

MSMA EVP Report .....21  
New Members.....24  
Missouri Medicine in the News.....25  
Correspondence .....26  
Annual Convention Schedule and General Sessions .....27  
Missouri Physicians Health Program Contributors .....28

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MSMA member names in bold

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# 2021: The State of Public Health in Missouri

by *Randall Williams, MD*

## Significant Events in Healthcare in Missouri in 2020-2021

- A historic whole government approach to a novel emerging virus with unprecedented collaboration in Missouri with national, state and local public, private, and academic partners
- Development of mRNA vaccines in a 10-month period with leadership from scientists at Pfizer in Chesterfield, Missouri, with first patients getting vaccine on December 14, 2020
- Development of the new HCBS and CDS Program
- Passage of the Medicaid Expansion Initiative in August 2020
- Implementation of the Medical Marijuana Program as per the Missouri Constitution

### COVID-19 and Impact on Healthcare

2020 was a year of historic challenges and achievements in healthcare internationally, nationally, and in Missouri as a result of COVID-19.

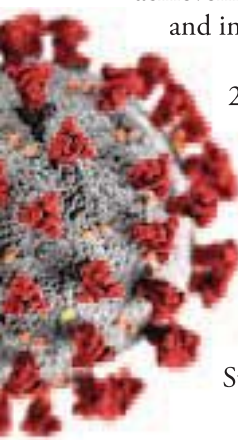
I gave a commencement speech in December 2019. There, I told the graduates, “Adversity does not build character; it reveals character.”

The Governor and I have discussed many times that we will remember all those in Missouri who showed their character by how hard they worked to help get us to a better place. From the scientists at Pfizer in Chesterfield, the members of the Missouri State Medical Association who faithfully gave

me feedback and insight at 8 a.m. every Saturday morning, the infectious disease doctors who shared their insight with the Governor’s team at 10 a.m. every Saturday morning, and most importantly, all the physicians and other health care providers who are on the frontlines taking care of patients each day: your character was revealed—you do not run from trouble but rather run toward it to help others.

Your compassion, resilience, resourcefulness, and courage while working tirelessly has and will need to continue during this unprecedented time. I do believe with your help, that we are on a path to a better place, but like any path, we have to walk, if not run along that path, to get to that better place.

I was privileged to represent Missouri at a small gathering at the White House with President Trump, Vice President Pence, and the President’s entire health care team on December 8 as we rolled out Operation Warp Speed. Only three state health directors were present, and it is a testament to Missouri’s implementation of that plan that we were one of the states invited. We now have increased resources in testing, knowledge and vaccines, but we also have more burden of disease. We, like everyone else, are now facing cold weather, flu season, and the fatigue of fighting this virus for nearly a year.



**Randall W. Williams, MD, FACOG**, is the Director of the Missouri Department of Health and Senior Services in Jefferson City, and an Obstetrician and Gynecologist.

I will always be thankful for Governor Parson green lighting our vaccination planning which started earnestly this past July. I vividly remember being challenged by some who said this was not the best use of resources since a vaccine would not be available until April of 2021. With a robust plan, we are now providing first doses to you and other healthcare workers, plus our long-term care staff and residents. The prioritization of these populations is incredibly important. Nursing home residents accounted for just 4.26% of our cases here in Missouri but 43.9% of our deaths (as of November 1, 2020).

The Governor led efforts to address concerns raised by hospitals by signing a deal with hospitals and the State of Missouri to use CARES Act funding to have Vizient address the staffing issues, especially among nurses, that they were facing.

We have continued to be innovative in inviting the CDC to come to Missouri and work with Saint Louis University and Washington University to voluntarily test students in two different settings to observe the outcomes—those who mask and, thus, continue to come to school if exposed at school, and those who don't mask at school and, thus, do not come to school for their full quarantine period.

We have always been mindful that a balanced approach recognizes the importance of public health to a community's well-being, but also that decreasing poverty and increasing educational opportunities improves public health.

### Medicaid Expansion

In any other year, the passage of Medicaid Expansion would be the major healthcare development in a state. Missouri joined 38 other states when voters approved Medicaid expansion in August 2020. We



Missouri Dept. of Health and Senior Services Randall Williams, MD, addresses coronavirus questions during the Governor's daily briefing. Dr. Randall reaches out to MSMA physicians every Saturday morning during a Q & A session beginning at 8 a.m. Details are at [msma.org/events](https://msma.org/events).

are meeting regularly and are committed to working with stakeholders and the General Assembly in implementing this to fulfill our constitutional duty.

### Medical Marijuana

Missouri became the thirty-third state to legalize medical marijuana, and the first product was dispensed to qualified patients at a state-licensed dispensary on October 17, 2020. This is a regulated medical program, and we have treated it as such with patients being our north star since the program's inception. Missouri was one of the fastest states to implement a medical marijuana law—sixth out of 33 states, and we have met every deliverable as required by the Missouri Constitution.

### Home and Community-Based Services

Four years ago, eligibility for Home- and Community-Based Services (HCBS) and Consumer Directed Services were a topic of much discussion in the legislature, and we made a commitment to look at

a program that had not changed since 1982, realizing much had changed in medicine since then. The Department is enhancing access to care for Missourians in need of long-term services and support through the HCBS Level of Care Transformation. This endeavor will alter eligibility guidelines for the first time since the HCBS program's inception in 1982. The transformation will allow state Medicaid resources to be allocated to those most in need as the state's elderly population continues to grow. These needs are measured through a blend of point and automatic eligibility triggers based on certain characteristics of need.

### Time Critical Diagnosis Program

Steve Bollin, a healthcare executive with over 20 years of healthcare experience, brought his expertise to the public sector when he became Director of the Division of Regulation and Licensure. His hiring is consistent with our vision of increasing the Department's subject matter expertise. Steve has taken a personal interest in getting our Time Critical Diagnosis program to a better place and has a 12-month plan to make improvements that reflect the importance of this program, especially in a rural state.

### Telehealth

2021 is now a year of challenges, and Governor Parson has always prioritized the state's workforce and infrastructure to improve the lives of all Missourians. COVID-19 has likely transformed the role of telehealth and telemedicine for all of us. We allied with our academic partners and MSMA partner, Karen Edison, MD, to hold four health ECHOs on patient management, and I think we will see more of that in the future.

### Inter-State Cooperation

I have worked closely with my counterparts in other states, especially Lee Norman in Kansas, and I think you will see more of that cooperation continue in the future with our neighbors. Data acquisition and analysis were brought to the forefront with COVID-19, and we have acquired EpiTrax to further our capabilities in this area. We have worked with our internal and external partners probably more than ever before. The collaboration with the MHA, MSMA, and academic partners, to me, is the wave of the future. To this point, I recently participated in a research project that studied where we are nationally and where we ought to go as we integrate state-level medicine in public health.

### Role of Public Health

The role of public health in quarantining and isolating people to prevent the spread of infection has been brought to the general public's attention in a way that has never occurred in any of our lifetimes. I anticipate there will be debate upon where that authority should be, and with that should come a discussion of the future of public health funding in this state. Missouri has historically been at the bottom of nationwide rankings for state funding of public health. The intensity of the criticism locally and nationally has led to a huge turnover in leadership at every level of public health in this country.

### A Thought Leader in Public Health

Missouri should be a national thought leader in public health and healthcare through its work with the Association of State and Territorial Health Officials (ASTHO) and other organizations. I am the first Missouri State Health Director in 75 years to serve in a leadership role with ASTHO, and I hope this will be the beginning of a long line of State Health Directors who serve in this way and represent Missouri. Our state lab has done a superb job during the crisis, and we were enormously helped by having Laboratory Director, Bill Whitmar, serve as president of the American Public Health Laboratory Association.

### Summary

It is clearly our intent to create a culture of subject matter expertise, using internal and external partners, that benefits Missourians and integrates with our national partners to serve our citizens and the country. The historian, Vegetius, said that courage is proportional to the knowledge of one's profession, and we always want to have the expertise and, thus, the courage to act to protect the health and safety of all Missourians.

I must say people stop me all the time to offer gratitude for what the Governor and all of us are doing to help protect their health and safety. For all of us in state government, it is truly a privilege to serve and we join you as a valued partner in that service.

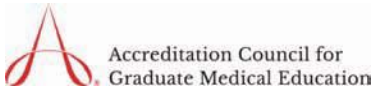
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# Mental Health from Medical School to Medical Practice: Finding a Path Forward

by Stuart Slavin, MD, MEd



**As individuals cultivate skills to promote their own satisfaction and well-being, efforts must also be made to improve the clinical and learning environment.**

## Abstract

**Medical students, residents, and practicing physicians experience high burnout, depression, and suicide rates, and the COVID-19 pandemic has exacerbated stress for many.<sup>1-6</sup> While laudable, current well-being efforts appear insufficient to meet the challenges that so many are facing. This essay explores approaches that individuals and organizations can take to promote mental health and well-being from medical school to practice.**

## Introduction

Medical student, resident, and physician mental health has been the focus of growing concern in recent years as it becomes increasingly clear that burnout, depression, and suicide are serious problems.<sup>1-4</sup> Mental health challenges from the COVID-19 pandemic have added new stressors—professional, personal, and financial—for many.<sup>5,6</sup> Uncertainty—often a primary source of anxiety—has never been greater for so many of us. While significant numbers of medical schools and medical centers have ramped up their mental health services in recent months, these are not likely to meet the mental health needs of trainees and physicians in the face of

widespread, unprecedented levels of stress and traumatic exposure in the healthcare setting. Using a *treatment* model, rather than a *preventative* model, to meet the mental health needs of physicians was not sufficient pre-COVID as burnout and depression rates remain stubbornly elevated—and it will not be sufficient in the midst, and aftermath, of this pandemic.

## A Path Forward

A number of foundational principles can inform approaches to a looming mental health crisis for physicians and trainees. First, we tend to conceive of well-being and mental health as binary—you are depressed or you are not; you are burned out or you are not. This is not accurate, and not particularly functional, because these conditions all exist along a continuum. Second, well-being may not be the best primary goal for our efforts. Instead, a more reasonable goal may be to increase satisfaction with your work, your life, and, for some, yourself. The goal should then be to help people move up the continuum no matter where they are, so that if you are fairly satisfied, perhaps you can become very satisfied; and, if you are extremely dissatisfied perhaps you



Stuart Slavin, MD, MEd, is Senior Scholar for Well-Being, Accreditation Council for Graduate Medical Education, Chicago, Illinois.

can become moderately dissatisfied. This, for many, will feel more attainable than reaching some magical state of well-being. Our focus cannot only be on those who meet a clinical diagnosis of depression or anxiety, or those who meet criteria for burnout; our approach must target those from across the continuum. Third, it's important to note that encouraging physicians to work on their resilience comes with risks. Many physicians feel they are very resilient, and rightly so.<sup>7</sup> They tolerate enormous demands and pressures, working heavy hours, and they show up to work, take care of their patients, and complete their charting. While this is true, this is only one kind of resilience, what I term survival resilience. But there is also another form of resilience which is a thriving resilience, and this also exists along a continuum. What is exciting is that there are easily teachable, learnable skills that anyone can use to cultivate this latter form of resilience. Fourth, because many physicians have limited time to learn and practice time-consuming well-being practices, the tools we offer to support physician mental health and well-being may have greater impact as they require little time to use and learn. Still, this is largely an environmental health problem, rather than an individual one.<sup>5</sup> Finally, while this piece focuses largely on individual strategies, it does not remove the obligation to work to improve clinical and learning environments. And while environmental factors are the main drivers of distress,<sup>8</sup> individual mindsets and patterns of thinking commonly found in physicians can contribute substantially to personal distress and mental illness. We need to help physicians and trainees develop skills to recognize and address these damaging mindsets and patterns of thinking.

### Mindsets and Thought Patterns

Common physician mindsets that contribute to distress can be categorized into three main clusters. These mindsets often have been acquired on the long and arduous path to becoming a physician, and people should feel no shame or guilt if they have them. Like well-being, they exist along a continuum that is fluid and subject to change with circumstances and environment. These mindsets are not always dysfunctional in

moderation, and they even may have contributed to many physicians' success along their academic paths. Cognitive psychologists have documented many of these mindsets in terms of automatic thoughts and cognitive distortions.<sup>9</sup>

The first cluster of mindsets is the largest, and it consists of mindsets that are characterized by a self-critical voice.

**Performance as identity:** the tendency to view your performance—whether academic in school, or professional as a physician—as your identity and worthiness. If you make an error, the thought process is often, “I’m a bad doctor and a bad person,” rather than “I made an error.”

**Maladaptive perfectionism:** a condition where you set the bar so unattainably high for yourself that you are repeatedly disappointed in yourself. The key here is disappointment in *yourself*, not just in your performance.

**Impostor phenomenon:** the feeling that you are incompetent, that you are a fraud, and it is only a matter of time before other people discover this.

**Personalization and self-blame:** the tendency to place complete blame on yourself when things don't go well.

**Feelings of guilt and shame:** Thoughts of imperfection and self-blame can contribute to self-critical thoughts and feelings of guilt and shame, often adding substantially to personal distress.

**Hiding vulnerability and distress:** many physicians and trainees tend to hide their distress which can then create the impression that others are doing fine. This can lead to individuals' belief that they are the only ones struggling.

The second cluster of mindsets is characterized by negative mood or affect—cynicism, negativity, and pessimism—that are understandable given the professional and emotional challenges in medicine. While understandable, these mindsets can fuel personal dissatisfaction and diminish well-being both in the workplace and at home.

The final cluster consists of two miscellaneous, but critically important, mindsets and thinking patterns. The first is having a fixed mindset rather than a growth mindset. Fixed mindsets have been associated most typically with cognitive ability<sup>10</sup>—namely, holding narratives such as “I’m not good at



Meditation can reduce limbic system activation.

math”—but the same mindset presents around skills like resilience, and this can inhibit personal growth. If a person has a fixed mindset around their own personal resilience, they will be less likely to become more resilient. The other problematic pattern of thinking involves automatic thoughts and cognitive distortions that can activate other mindsets.

These mindsets are common in medical students, residents, and physicians and can contribute to both personal distress and mental illness. A study that I led of first-year medical students found that those who screened positive for maladaptive perfectionism or impostor phenomenon were more likely to have feelings of inadequacy, embarrassment, or shame about their academic performance.<sup>12</sup> Those who experienced these latter feelings were significantly more likely to screen positive for depression and anxiety. The good news though is that *every one of these mindsets is changeable* through the cultivation of simple techniques of metacognition and mindful awareness.

## Metacognition

Metacognition is simply the ability to examine your thoughts and to change to be more accurate and beneficial to your mental health. The most important metacognitive skill is cognitive reframing, the basis for Cognitive Behavioral Therapy (CBT). CBT is the preferred treatment for anxiety disorder and panic attacks, helpful for depression, and useful for addressing maladaptive perfectionism and/or impostor phenomenon. Unfortunately, we usually don't teach these skills until someone has already developed clinical depression or anxiety and seeks support from a therapist. The key to preventative mental health care is learning these skills *before* many mindsets, cognitive distortions, or emotions culminate in mental illness.

## Cognitive Reframing

We tend to go through life thinking that an adverse event equals an adverse outcome—meaning that if something bad happens, that is the personal

outcome as well. This is not true; it is an adverse event *plus* your cognitive/emotional reaction that equals the outcome.<sup>13</sup> We all suffer from distorted reactions or automatic thoughts that can contribute to distress, but there are concrete steps we can take to gently reframe them. Following are some of the most common automatic thoughts:

**Magnification:** taking a relatively small event and blowing it up into a much bigger problem.

**All or none thinking:** either getting the result you wanted or feeling like a failure.

**Tunnel vision:** focusing on one negative event and ignoring or discounting the many positive ones.

**Overgeneralization:** seeing a negative event as part of a pattern of bad things that always happen to you.

**Fortune-telling:** predicting a future outcome with certainty.

**Mind-reading:** feeling like you know with certainty what another person is thinking. For example, when a colleague passes in the hallway and looks up and frowns, we create narratives that we must have done something to offend the person and they are angry at us.

**“Should” statements:** second-guessing yourself when the outcome isn’t ideal by thinking “I should have done this; I should have done that.”

Albert Ellis, one of the fathers of cognitive-behavioral therapies, introduced many helpful concepts for challenging these types of thinking.<sup>14</sup> Cognitive reframing, also known as cognitive restructuring, consists of three steps. First is to simply *notice* your thoughts. This requires having some skill in mindful awareness, which I will outline next. Second is to *label* the thought—whether a mindset or a cognitive distortion—to recognize that you are, for example, magnifying, or are thinking in perfectionistic terms. The third step is to try to *dispute* the thought distortions. There are many options for disputing strategies, but the following two are particularly easy to understand and to use. The first is to simply examine the evidence there is to support the thought, and the evidence there is against it. For example, some medical students who perform poorly on an exam can feel “stupid.” The evidence that they are low in intelligence is non-existent;

they are in medical school, and there are a whole host of reasons why someone would not perform well on an exam. The second approach, called the double standard, is one that I find particularly illuminating and helpful. Here is an example. Let’s say a colleague comes up to you and says, “I feel terrible, I didn’t know the answer when I was asked a simple clinical question by my boss today.” Would you say to them? “Well, you’re stupid. You’re not cut out to be a doctor.” Of course not (or at least I hope not!). The goal in countering the double standard is to extend the same compassion you have toward other people to yourself.

Metacognition can also help in managing future oriented worries, fears, and anxieties. A common and understandable worry and fear that clinicians may have in the midst of the pandemic is that they may get ill, or that they may bring COVID-19 home to their spouse, children, and/or other family members and that they could get sick and die. These are completely understandable fears to have, and they may feel terrifying or even debilitating.<sup>15</sup> The question is not how to completely eliminate or suppress these feelings, but rather how to manage these thoughts to decrease distress. One way of framing: yes, that reality that is possible, but how likely are certain outcomes? Even though you may face a relatively high risk of getting the infection, it is very likely that you will recover.<sup>15</sup> Those less than 60 years of age without underlying medical conditions appear to have a mortality rate below 1%, with child mortality rates even lower. Therefore, even if you or they become infected, the great, great likelihood is that you will recover and your family members will too. In addition to managing these understandable fears, you also can move to the strategic. What can you control? Do everything you can to reduce the risk that you and your family members will get infected. Be vigilant about protecting yourself. Change of clothes, a serious hand wash before you leave the hospital, hand wash when you get home, and continued social distancing outside the home are things within your control. Optimizing sleep, nutrition, and exercise can boost your immune system and decrease the likelihood of an adverse outcome from COVID-19 should you become infected. A key principle here is that the goal is not



to *eliminate* thoughts and worries. Rather, it's to hold them gently—to work with them so they will cause you less suffering and harm.<sup>13</sup>

### Mindful Awareness

The second essential skill to develop is mindful awareness. One needs to be sufficiently present and aware to notice thoughts and feelings in order to be able to work with them. The classical approach to becoming more mindful has been meditation, and numerous courses and apps are available for this. Meditation works, but in my experience relatively few physicians are willing or able to incorporate regular formal meditation practices in their lives. I have given talks to audiences across the country and have asked physicians to raise their hands if they have a meditation practice of 15 minutes or more a day. I have never seen more than 3% raise their hands even in places like California where meditation may be more in mainstream consciousness. Meditation works but if many are not likely to practice it due to time and effort, it may not be an optimal public health intervention for physicians unless we change the structural demands on their time. The good news is that you can become significantly more mindful (moving up a mindfulness continuum) through informal practices that take little or no time to employ. There are a number of informal mindful practices, but a simple one is to just focus on one of your senses (auditory, smell, touch, or sight) for just 30 to 45 seconds. As thoughts appear, just notice them and return your attention to the sense you were focusing on. This can be used as you are walking from one place to another, when washing your hands before seeing a patient, or in a myriad of other activities.

### Reducing Limbic System Activation

During the COVID pandemic, the skill of reducing a sense of alarm and overall limbic system activation is essential. A self-calming technique that has been proven effective in the military is called tactical breathing.<sup>15</sup> Here's how it works:

Relax yourself by taking four breaths as follows. If you want, try to visualize each number as you count. Breathe in counting 1, 2, 3, 4. Stop and hold your breath counting 1, 2, 3, 4. Exhale counting 1, 2, 3, 4. Repeat the breathing cycle.<sup>13</sup>

You can practice this as many times a day as you would like, for just a minute or so. Then, when you are feeling acute stress, you can do it—even for a few breath cycles—to calm your amygdala. To reduce activation of your limbic system, be mindful of excessive caffeine consumption, as well as excessive consumption of news and social media. A study after the Boston Marathon bombing found that those who had heavy consumption of media in the week following the bombing led to higher acute stress levels than those who witnessed the bombing in person.<sup>13,16</sup>

### Other Tools in a Resilience Toolbox

Metacognition and mindfulness are essential skills in finding greater satisfaction with work, with life, and with the self, but there are other skills that can also be helpful in this quest. I view these as forming a toolbox, and you can choose tools that you feel that you need most. The tools include the following strategies: combating negativity bias and pessimism, cultivating positive emotions, emotional self-regulation, dealing with difficult people, investing in well-being, avoiding learned helplessness, cultivating a sense of generosity and gratitude, and finding meaning and purpose in life.

The key with the toolbox approach is its adaptability; some tools may be helpful for you, while others may not be—and you can tailor your toolbox to fit your own specific needs. I do not use all of the tools listed here, but some have changed my life in recent years in ways I did not think was possible. You can find more about the toolbox in a series of four podcasts produced by the ACGME at <https://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being/AWARE-Well-Being-Resources>, and on Spotify and other podcast platforms by searching ACGME AWARE.

### Changing the Clinical and Learning Environment

As individuals cultivate skills to promote their own satisfaction and well-being, efforts must also be made to improve the clinical and learning environment. In 2009, Saint Louis University School of Medicine embarked on a series of simple changes designed to reduce pressure on students—reducing class time and curricular content, freeing time for elective opportunities, and changing to pass-

fail grading—that led to decreases in depression and anxiety of more than 80% in pre-clerkship students.<sup>17, 18</sup> The clinical environment is more challenging to change, but conceptual frameworks from organizational psychology can guide action. A helpful model for this merges the concepts from work by Christina Maslach and Daniel Pink, and includes eight main drivers of burnout in health care.<sup>19,20</sup> They include the following:

**Workload:** not just how much, but the qualities and characteristics of it.

**Rewards:** not just financial, but whether and to what extent a person feels appreciated and valued.

**Control:** transparency in decision-making and feeling like your voice matters.

**Community:** sense of connection to others at work.

**Fairness:** whether people are treated with fairness and equity.

**Values:** whether the organization acts consistently with the values it states.

**Mastery:** if effective and regular feedback on performance is given.

**Meaning:** if people in the organization feel a sense of meaning and purpose.

## Conclusion

I have ended virtually all of my talks in the last two years with a quote from Viktor Frankl, and I will end this commentary in the same way. Frankl, the noted psychiatrist, author, and Holocaust survivor wrote, “There is nothing in the world, I venture to say, that would so effectively help one to survive even the worst conditions as the knowledge that there is a meaning in one’s life. There is much wisdom in the words of Nietzsche: ‘He who has a why to live for can bear almost any how.’<sup>21</sup> Physicians, in the midst of the challenges in medicine, need to find that why, feel that why, and be sustained by that why. But we also have to remember that we can and must work to change the how.

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None reported.

MM

# Healthcare Provider Wellness in the Time of COVID and Beyond

The root cause of moral injury among physicians is “being unable to provide high-quality care and healing in the context of health care.”

by Lawrence M. Lewis, MD, Christopher R. Carpenter, MD, Randall Jotte, MD  
& Evan Schwarz, MD

Physician well-being and the larger topic of healthcare provider well-being has taken on an increased sense of urgency during the current COVID-19 pandemic. To be sure there has been a unique set of challenges resulting from caring for patients with COVID-19 (Table 1). Early in the pandemic, based on multiple interviews, Shanafelt, et al. identified eight frequently cited sources of healthcare provider anxiety related to COVID-19.<sup>1</sup> The COVID-19 pandemic has mostly illuminated the problems that have been lurking within our healthcare system for quite some time. It would be misleading to focus solely on this pandemic crisis as a novel cause of physician and healthcare provider burnout and dissatisfaction. The recognition of physician burnout and the quest to improve physician well-being predates COVID<sup>2,3</sup> and will outlast it.



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It is impossible to divorce wellness in the workplace from the overall wellness experienced within a society. Over the past two decades much has been published regarding how to best define and measure societal well-being and quality of life, along with multiple efforts to develop validated tools to measure it.<sup>4-7</sup> These tools advanced beyond the previous simplistic model which equated wellness solely with national wealth and gross domestic product, to one that was complex and multidimensional. This model includes material living standards (income, wealth), health, education, personal activities (including work), political governance, social connections, environment, and insecurity (both economic and societal).

## Physician Burnout

Within this larger framework, work or occupation can be a dominant positive factor in achieving and maintaining well-being in that it affects many of the other components, including wealth, health, education, social connections, and insecurity. The benefits of work in these other areas of well-being likely varies based on one's exact role in the healthcare system (technician, nurse, advanced practice provider, or physician). Physicians might be expected to benefit in many, if

Table 1.

## Unique Wellness Challenges During the COVID-19 Pandemic

- Fear of contracting the disease (inadequate PPE)
- Fear of giving the disease to family members
- Constantly dealing with overwhelming numbers of critically sick patients
- Lack of evidence-based and up-to-the-minute information regarding treatment
- Poor outcomes in people who presented walking and talking
- Difficulty admitting patients, particularly to high levels of care
- Inability to console family members or allow family closure
- Backfilling shifts due to sick or quarantined workers
- Frequent (often daily) changes in policy & procedures

not most, of the wellness measures based on their occupation; so why do physicians apparently score lower on well-being measurements than other professionals and even non-professional workers?<sup>8</sup> Interestingly, it does not start out that way. At least one large study found that persons about to begin medical school suffer less from burnout and have higher quality of life scores across all tested domains when compared to age and education matched controls in the general population.<sup>9</sup> These better than average quality of life scores among beginning medical students begin to fall below the average of their matched controls during medical school and residency and remain below population averages among physicians in practice.<sup>8,10</sup> This suggests that it is not an underlying lack of personal resiliency or psychological well-being which leads to excessive burnout among physicians, but rather the circumstances of their training and practice.<sup>9,10</sup>

Physician burnout has been a hot topic in the international medical literature for at least a decade. It turns out that the United States is not alone when it comes to physician burn-out, and the same causes seem to be universally responsible, although the magnitude differs by country (and likely on a more granular scale by work location).<sup>11</sup> The factors which are most often cited by physicians as the major contributors to job dis-satisfaction and burn-out are: administrative burden, excessive bureaucratic tasks, insufficient time to complete tasks, spending too many hours at work, and lack

of respect.<sup>12-14</sup> Although the electronic health record is a significant contributor to burnout, its relative importance is age-dependent, with only post-World War II “baby boomers” rating it in the top three causes.<sup>13</sup> An overarching theme summarized by a paper from the Agency for Healthcare Research & Quality (AHRQ) is that chaotic environments, low control over work pace, and an unfavorable organizational culture were strongly associated with burnout and intent to leave practice (AHRQ).<sup>14</sup>

Hospitals and medical centers (whether academic, public, or private) have become increasingly aware of the problem of physician burnout. The answer many organizations initially embraced to this growing threat was to offer mindfulness and resiliency training.<sup>15</sup> West et al. found that mean physician resiliency scores were significantly higher than those of the general population, and although higher resiliency scores were associated with less burnout, there were still high burnout rates even among those with high resiliency scores.<sup>16</sup> We do not minimize the benefit of mindfulness and resiliency programs, as they can help to promote well-being. However, such individually initiated measures must be part of a larger effort to 1) improve work conditions, 2) allow more autonomy, 3) promote a culture of respect and cooperation, and 4) make employee satisfaction a measured quality indicator (AHRQ).<sup>1, 14, 15</sup> Relying solely on resiliency training





as a solution to burnout brings H.L. Mencken's quote to mind: "For every complex problem there is an answer that is clear, simple, and wrong."

### How COVID Has Contributed to Burnout

Our struggle with identifying and fixing the underlying causes of burnout and dissatisfaction in the clinical practice of medicine may be at least partially informed by the ongoing COVID-19 pandemic. However, there is a unique factor which has emerged with COVID-19. That factor is fear; fear of contracting the disease and fear of spreading it to loved ones.<sup>1, 17</sup> Those of us in healthcare have seen unique changes in practice during this pandemic, from decreasing availability of consultations to segregating admissions by COVID-19 testing. We have also seen alterations in off-work behavior, with many healthcare workers isolating in basements, garages, or trailers rather than going home and exposing their family to possible infection.<sup>18</sup> Although physicians in general recognize that they can contract disease from their patients, this pandemic has been vastly different. The response of healthcare administrators and managers regarding the very real fear factor during this pandemic is one of the universal lessons regarding clinician burnout we can learn from COVID-19. We have seen how expressions of appreciation from patients, the public, and health administrators can inoculate to some extent against the overwhelming fatigue of caring for a continuous wave of sick patients, often with insufficient personal protection, and constantly having to fill shifts for those that have been taken from our ranks by disease or quarantine. A recent Canadian survey of emergency physicians showed that physician burnout remained stable during the first 10 weeks of the pandemic and acknowledged that expressions of patient gratitude and renewed purpose were important factors for maintaining physician wellness.<sup>19</sup> But we have also seen that expressions of appreciation are hard to sustain. We have seen how lack of commitment, if not resistance, by many to undertake the steps required to control the pandemic<sup>20</sup> and the reluctance of healthcare administrators to maintain their workforce in the face of financial losses have demoralized our frontline caregivers.<sup>21</sup> Initially

there was a concerted St. Louis metropolitan-wide effort to streamline processes and to provide space and resources to care for COVID-19 patients. This was given the highest priority. There was also an unprecedented cooperation among various departments and services to meet this once-in-a-lifetime challenge, but as overall patient volumes and revenues decreased, and it appeared that the wave of illness was waning, these efforts and attitudes were not sustained. When the third (and by far most devastating) wave hit, it felt as though there was little appetite to redouble the efforts that had been put in place to suppress the first wave. As a tsunami of patients inundated our emergency departments and hospitals, a familiar feeling of chaos, time pressure, and lack of control over our workplace descended. These of course, are well known to be associated with dissatisfaction and burnout,<sup>14</sup> but many have begun postulating that the real underlying cause of physician burnout, particularly in the time of COVID-19, is something more egregious: "moral injury." This relatively recent idea has been elevated to the fore by the ongoing pandemic. The term "moral injury" was first used in 1981 by Friedman to describe a psychological condition found in post-Vietnam war veterans.<sup>22</sup> It was further explored in a wider array of war veterans by Litz, et al. in 2009.<sup>23</sup> Litz described moral injury in the veterans he was seeing as "a wound that can occur when troops participate in, witness or fall victim to actions that transgress their most deeply held moral beliefs." Diane Silver, in a 2015 article describing the epidemic of post-traumatic stress disorder that Litz and others were treating among Afghanistan and Iraqi veterans, wrote that moral injury is "a deep soul wound that pierces a person's identity, sense of morality, and relationship to society."<sup>24</sup> The first reference I could find regarding moral injury in healthcare workers was in an opinion piece by Talbot and Dean in 2018.<sup>25</sup> In this piece they attempt to explain the difference between the source of moral injury in war veterans and those in healthcare workers. They suggest that the root cause of moral injury among physicians (and I dare say among other healthcare providers as well) is "being unable to provide high-quality care and healing in the context of health care." They go on to say that the failure "to consistently meet patients' needs has a profound



impact on physician well-being — this is the crux of consequent moral injury.”

The National Academy of Medicine has recently put out a statement entitled “Strategies to Support the Health and Well-Being of Clinicians During the COVID-19 Outbreak” recognizing the role that “moral dilemmas” are playing in exacerbating physician burnout during this pandemic.<sup>26</sup> They provide several recommendations for managers and healthcare leaders which almost all of us would agree would be helpful, but which are woefully underutilized currently. The statement begins with a simple directive: “Provide clear messages that clinicians are valued.” The need for this is further emphasized in the opinion piece by Shanafelt et al.<sup>1</sup> Based on interviews with 69 healthcare workers, they conclude that “simple and genuine expressions of gratitude for the commitment of health care professionals and their willingness to put themselves in harm’s way for patients and colleagues cannot be overstated.” But statements without tangible signs of support and care “ring hollow.” The most important way to send a clear message that front-line healthcare workers are valued is by supporting them in real actions and in real time. Asking “everyday heroes” to care for COVID-19 patients without adequate PPE is not a show of support or respect. If the procurement of adequate PPE is impossible, then all energy must be focused on developing and implementing the best evidence-based alternatives with honesty and transparency.<sup>27</sup> It is not just managers and healthcare leaders that must step up. The need for real actions to lower physician burnout during this critical time is required by the general population as well. A recent survey of more than 2,300 physicians found that 80% identified lack of population compliance with masking and social distancing protocols as the single greatest cause of frustration to them.<sup>28</sup>

We have entered what we hope is the final phase of this pandemic, with the approval of highly effective vaccines for general use. However, even with this promising news, the implementation of vaccination policies has appeared haphazard and problematic. The best strategy regarding vaccination priority can be debated, but the debate should include representatives from the most impacted groups and should be transparent. If vaccination access across the healthcare workforce will take a month or more, and our frontline workers are seeing a peak in COVID-19

patients right now, then putting younger frontline workers (whether they be nurses, technicians, therapists, environmental services, security, transportation, trainees, or physicians) at the back of the queue, allowing older providers earlier access, even if they have an extremely low exposure risk does not seem equitable. A more equitable approach may be to vaccinate frontline healthcare workers who are exposed daily to known or suspected COVID-19 patients, and within this group to stratify by risk factors for severe disease, such as age. There are clearly reasons for vaccinating our older population as quickly as possible, but it makes little sense to delay frontline workers, not because they are at high risk of dying, although there are estimates that there have been nearly 3,000 deaths among healthcare workers as of November of 2020.<sup>28</sup> But rather because when they get sick or need to quarantine, the loss can decimate the workforce we are relying on for our care.<sup>29</sup>

The National Academy of Medicine and the Agency for Healthcare Research and Quality also have some wellness recommendations for clinicians, which are likely to be helpful if they can be implemented.<sup>14,26</sup> Self-care, taking breaks, staying connected, and performing self-check-ins are among these, but it may be the final recommendation that is most important to heed: Take the time to “Honor your service: remind yourself and others of the important and noble work you are doing. Recognize colleagues for their service whenever possible.” This has been even more challenging in the time of COVID-19. As an example, our Medical Staff Association has had to cancel several traditional annual events in which they honor their extraordinary clinicians and scientists for their service.

## Conclusion

Ours is a noble profession, but we must be allowed the time and resources to fulfill our obligation to our patients or we take home the guilt of a job poorly done. That job has always been to help those we can and to comfort those we cannot. In the time of COVID-19, there is often insufficient time to do either. This is not an insolvable problem, but it will take determination and grit and the reimagining of a healthcare delivery system that is truly driven by patient-centric outcomes rather than



production parameters. As Dean & Talbot conclude: “Physicians must be treated with respect, autonomy, and [given] the authority to make rational, safe, evidence-based, and financially responsible decisions.”<sup>25</sup> For those interested, one way to help healthcare families who need it is the Frontline Families Fund. Led by the Saint Paul & Minnesota Foundation in partnership with Dr. Michael Osterholm, the Director of the Center for Infectious Disease Research and Policy (CIDRAP) at the University of Minnesota.

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## Acknowledgment

The authors would like to acknowledge Dr. Teresa Chan for her insightful contributions and citations.

MM

# Light at the End of the Pandemic Tunnel?

*by George J. Hruza, MD*

# COVID-19

**A**fter the devastation of 2020 wrought by the COVID-19 pandemic, many of us are glad 2020 is behind us. The U.S. has suffered through hundreds of thousands of deaths caused by the virus, plus additional deaths resulting from the fallout of economic lockdowns: the potential for increased suicides,<sup>1</sup> domestic abuse, opioid overdoses,<sup>2</sup> deferred cancer treatment and other important healthcare services.

As with some of your families, our family has experienced COVID-19 up close and personal with my wife, stepdaughter and her boyfriend coming down with it just before Christmas Eve. While they were recovering, I shut down my office and quarantined from my family for two weeks. Certainly not a fun way to spend the holidays. I did not become infected, which was fortunate due to my age and an underlying medical

condition putting me in a higher risk category for severe disease. Our household was visited by COVID-19 despite everyone following CDC recommendations of physical distancing, wearing masks, and frequent hand washing. I firmly believe that a COVID-19 vaccine is our best chance to get past this pandemic.

Operation Warp Speed cut red tape, supported COVID-19 vaccine research, and ordered millions of vaccine doses of the most promising candidates, giving pharmaceutical companies a guaranteed market for their potential vaccine. The FDA stepped up, slashed the red tape, and worked with the drug companies to make sure their studies were optimized for success. In addition, the development of the vaccines was done in parallel rather than series so that the various clinical phases were done concurrently while tens of millions

of doses were being manufactured at the same time. The Operation delivered two vaccines in less than one year. This is by far a record for any vaccine approved by the FDA in history. Five years is usually estimated for a vaccine to go from the lab to approval. Even more encouraging is the 95% efficacy rate after two doses,<sup>3</sup> which is far higher than the influenza vaccine and many others.

The FDA, a highly respected scientific organization not known for its speediness, went way beyond expectations giving emergency use authorization (EUA) to both mRNA vaccines within days of getting the phase III data from the companies. Even more impressive was that the vaccine was on its way to designated vaccination sites across the country within hours of the EUA.

As one would expect from this unprecedented effort, there have been glitches in the manufacturing process as well as in delivering the vaccines to where they are needed without unnecessary waste or spoilage. As of this writing on December 31, 2020, millions of doses have been administered to individuals across the U.S. in phase 1A. In Missouri, vaccine distribution priority for vaccination in phase 1A includes patient-facing healthcare workers, residents of long-term care facilities and their staff or about 500,000 Missourians. Phase 1B includes the three million Missouri residents older than 64, 18-64 with an underlying condition putting them at high risk of severe COVID-19 disease (obesity, diabetes, chronic kidney disease, COPD, hypertension, chronic heart disease), first responders and essential workers. Phase 2 includes other residents at increased risk such as the homeless and those who are incarcerated. Phase 3 includes all Missouri residents.

The rollout started with the Pfizer vaccine distributed to major hospitals (they have the necessary super-cold storage needed) around the state, which immediately started vaccinating all their staffs. Smaller hospitals started receiving the Moderna vaccine a few weeks later, especially in rural Missouri after CVS and Walgreens received the vaccine for the federal program to vaccinate long-term care facility residents and staff.

One group in phase 1A was conspicuous by its absence from the initial rollout—office-based, patient-facing physicians, and their staff. They take care of many elderly patients, often with underlying medical conditions. To provide a safe environment for these patients to be taken care of and kept out of overloaded

hospitals, office-based practices are a key part of the healthcare system, especially during the pandemic. A few physicians in office-based practices were able to get vaccinated in a hospital where they see patients. Unfortunately, that still left many other physicians and, even more crucial, their patient-facing staffs unvaccinated. Independent practices were advised to sign up to be a vaccinator site. Becoming a vaccinator site for the Moderna vaccine requires a medical freezer and/or refrigerator, 24/7 temperature monitoring and recording, extensive record-keeping, and reporting to the ShowMeVax registry (<https://showmevax.health.mo.gov/smv/login.aspx>) and a minimum order of 100 doses. Since every dose must be accounted for, these requirements are practical only for the largest independent practices. What about the rest of us and our practices? It seemed to me as though office-based practices were not fully considered in the government's carefully outlined and phased vaccination plans. Missouri is not alone, almost all other states seem to be in the same boat.

Your Missouri State Medical Association sprang into action and started working with the Missouri Department of Health and Senior Services (<https://covidvaccine.mo.gov/>), other healthcare organizations and even the National Guard to develop and execute a plan that would vaccinate office-based, patient-facing healthcare workers not affiliated with hospitals or healthcare systems during phase 1A as vaccine availability expands. Hopefully, by the time you read this, the plan will have been put into action with all independent practice patient-facing staff having been given the opportunity to get vaccinated. Hospitals have now started offering the vaccine to offices whose physicians are affiliated with them. The St. Louis County Department of Health has started offering the vaccine to unaffiliated office staff. I encourage you to advocate with your hospital and county health department to include your office staff as vaccine availability ramps up. As independent vaccinator sites are approved, they will be listed on <https://covidvaccine.mo.gov/>. Once the pharmacy chains have completed vaccinating staff and residents of long-term care facilities, they will start offering the vaccine to patient-facing health-care workers. You will be getting regular updates from MSMA ([msma.org/covid](https://msma.org/covid)) about when and how to get COVID-19 vaccination for your practices.

Missouri is expecting to receive about two million vaccine doses by February 2021 to be able to vaccinate phases 1A, 1B, and 2 individuals interested in getting a vaccine. The hope is that by April and May 2021 phase 3 individuals will get access to the vaccine. Support for getting a COVID-19 vaccine has dropped from 74% to 56% from April to December 2020<sup>4</sup> and there are numerous reports of half or more of frontline healthcare workers (even in COVID-19 ICUs and nursing homes) refusing vaccinations. Such skepticism is quite disconcerting and perplexing to me. As the risk-benefit ratio of this vaccine is so overwhelmingly favorable, it is difficult to understand the opposition to it, especially by healthcare workers, who should know better. It has become clear that we must lead by example and get ourselves and our staff vaccinated when our turn comes. It is up to us to educate our patients and the public at large about the importance of getting as many people as possible vaccinated so that we can, as a society, get past this pandemic.

Operation Warp Speed has been a great public-private partnership as well as a “miracle” of science. It certainly gives many of us hope for a return to a

semblance of “normal” with far less death and suffering in 2021 than what the world endured in 2020.

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**George J. Hruza, MD, MBA, FAAD, FACMS**, is the 2020-2021 MSMA President. He practices Dermatology in St. Louis, Missouri.

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## Jeff Howell Takes the Helm of MSMA in 2021



*Jeff Howell, JD, became the new MSMA Executive Vice President effective January 1, 2021, replacing Patrick Mills, who retired at the end of 2020, following a 28-year career with MSMA. Jeff is the eighth Executive Vice President in the 170 years of MSMA.*

*Jeff has been MSMA's Director of Government Relations since 2011. As an attorney, he has also served as the Association's General Counsel since 2006. Jeff has been the face of physician advocacy at the state capitol for a number of years. Some of his accomplishments include steering a medical malpractice noneconomic damages cap through the legislature, changing burdensome insurer prior authorization practices, creating a surprise billing mediation process, and warding off scores of scope-of-practice bills. Watch for his column in each edition of Missouri Medicine.*

**H**ere we go...Over the past year, I've had the pleasure of working with my successor, Patrick Mills, on the transfer of the administrative and historical knowledge required to keep the association running smoothly. It's a larger task than one might think, with many moving pieces. I would like to personally thank Pat for the support and instruction during the transition. I have big shoes to fill.

The MSMA staff does much to support physicians and the practice of medicine. Every January, the General Assembly convenes in Jefferson City and much of MSMA's value is directly tied to our advocacy efforts. Our two ace lobbyists Heidi Geisbuhler Sutherland and Shantel Dooling will be your advocates at the capitol this spring. They're already making sure your voice is heard in the marble halls.

Benita Stennis oversees MSMA's continuing medical education efforts. She is also in charge of planning the association's Annual Convention – a Ruthian effort – and various other meetings. She gets an ample assist from Carol Meyer, who runs meeting registration and recruits delegates to the House.

Communications and messaging are vital parts of how we interact with members. Liz Fleenor is charged with the development of our first-rate publications, including serving as Managing Editor of our journal, the award-winning *Missouri Medicine*. She also puts together our monthly newsletter *Progress Notes*, works on our social media channels, and develops our website.

Cassie Williams runs point for our membership database, assists with the Missouri State Medical Foundation, and manages renewal and recruitment billings. Need to know if your colleague is a member so you can recruit them? Ask Cassie.

Finally, Cheri Martin is our all-star utility infielder. She does it all. She administers MMPAC, keeps office projects on schedule, is a top-notch problem solver, and keeps us flush with the things we need to be successful.

Every MSMA member should consider us an extension of their own office staff. Please don't hesitate to reach out with your questions, concerns, or ideas.

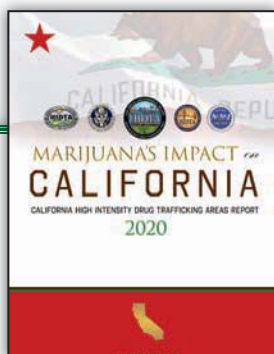
I can be reached by calling 573-691-4504, or emailing [jhowell@msma.org](mailto:jhowell@msma.org). Here's to a successful 2021.

**MM**

# Marijuana's Impact on California: 2020

## Cannabis-related ER visits and admissions sky-rocket after medical and recreational marijuana laws

*Marijuana's impact on California November 2020* In 1996, California became the first state to legalize marijuana for medicinal purposes with the passage of Proposition 215. Now, in 2020, recreational marijuana use is fully legal within California for individuals 21 years of age and over. Below is the Executive Summary of the California High Intensity Drug Trafficking Area Report and the current and potential impacts of these policies.



### KEY FINDINGS

- From 2016 (125,418) to 2019 (236,954), California emergency department visits and admissions for any related marijuana use has increased by 89%.
- Cannabidiol-related (CBD) exposure calls in California increased from 2014 (3) to 2019 (1,526).
- From 2005 (1,412) to 2019 (16,151) there was a 1044% increase in California emergency department visits and admissions for primary marijuana use, with a 56% increase from 2016 (10,361) to 2019 (16,151).
- From 2005 (1,393) to 2019 (14,993) there was a 976% increase in California emergency department visits with marijuana-related occurrences.
- E-Cigarette (vaping) and nicotine exposure calls in California from 2011 (269) to 2019 (5,335) has increased by 1883%.

#### Section One: Potency and Price of Marijuana

- Nationally, the average potency of tetrahydrocannabinol (THC), the primary psychoactive found in marijuana, has risen in marijuana concentrates from 13.23% in 1995 to 60.95% in 2018.
- Nationally, the average potency of tetrahydrocannabinol (THC), the primary psychoactive found in marijuana, has risen in traditional marijuana from 3.96% in 1995 to 16.16% in 2018.
- The price of a pound (lb.) of marijuana in California can vary from \$100 to \$2,000 depending on THC potency level.

#### Section Two: Vaping

- Nationally, lifetime (any) vaping use among middle and high school students has increased from 2017 to 2019: 8th grade increased from 1.6% to 3.9%, 10th grade increased from 4.3% to 12.6%, and 12th grade increased from 5.0% to 14.0%.
- Nationally in 2019, the daily use of nicotine vaping is higher than the daily use of smoking tobacco across all grade levels: 1.9% vs. 0.8% in 8th grade, 6.9% vs. 1.3% in 10th grade and 11.7% vs. 2.4% 12th grade.
- Nationally, the 30-day prevalence of marijuana (non-vaping), vaping marijuana and cigarette use increased across 8th, 10th, and 12th graders from 2017 to 2019, with the exception of cigarette use in 10th and 12th graders in 2019 which decreased from 5% to 3.4% and 9.7% to 5.7%.
- From 2017 to 2018, national past month marijuana vaping use among college aged individuals more than doubled in those enrolled in college, while remaining relatively stable among those not in college.

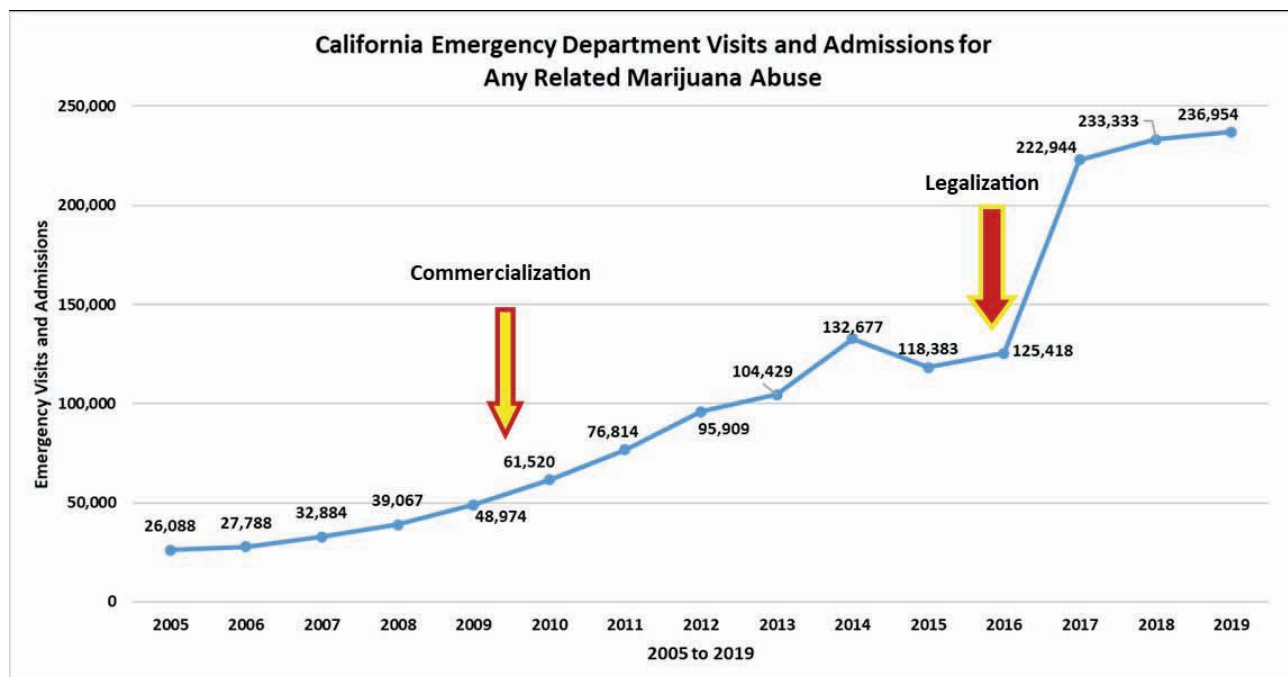
#### Section Three: California Youth Marijuana Use Ages 12-17

- California youth have consistently had a lower perception of risk of smoking marijuana once a month, compared to the national average (2010-2018).
- California continues to have a higher rate of past month use of marijuana in individuals ages 12 and older (2011-2018).
- Nationally in 2019, vaping (any substance) has surpassed alcohol and marijuana use for 8th and 10th graders.

#### Section Four: California Marijuana Use Ages 18-25

- From 2017 to 2018, California's marijuana use by 18- to 25-year-olds continued to surpass their use of cigarettes, 25.16% vs. 14.52%.
- In California, 36.3% of adults aged 18 to 25 reported using cigarettes, e-cigarettes, or marijuana in 2018.





### Section Five: California Marijuana Use Ages 26 and Older

- From 2017 to 2018, California's marijuana use for individuals 26 years and older continued to surpass the national average, 10.39% vs. 8.25%.

### Section Six: California Arrests for Drug Sales, DUI, and Possession of Cannabis While Driving

- In California, (state) arrests for the sale of marijuana has decreased from 2015 (8,368) to 2018 (1,857).

### Section Seven: Public Health

- From 2016 (125,418) to 2019 (236,954), California Emergency Department visits and admissions for any related marijuana abuse has increased by 89%.
- From 2005 (1,412) to 2019 (16,151) there was a 1,044% increase in California emergency department visits and admissions for primary marijuana abuse, with a 56% increase from 2016 (10,361) to 2019 (16,151).
- From 2005 (1,393) to 2019 (14,993) there was a 976% increase in California emergency department visits with marijuana as the primary reason for being seen.

### Section Eight: Treatment

- In California in 2019, 41% of marijuana treatment admissions were amongst those 12 to 17 years of age.

### Section Nine: Diversion and Eradication

- In 2019, 59% of illegal marijuana plant seizures occurred on private land (trespass grows/not by owner), which was a significant increase from 44% in 2018.
- United States Customs and Border Protection, Air and Marine Operations (nationwide) marijuana seizures have increased by 176% from 59,396 lbs. in FY 2019 to 164,216 lbs. in 2020 (TD August).

### Section Ten: THC Extraction Labs

- There were 194 reported clandestine lab incidents in California in 2019. Out of the 194 reported labs, 72.6% were honey oil/THC extraction (141), followed by precursor chemicals 9.3% (18).

### Section Eleven: Environmental Impacts of Marijuana Cultivation

- Outdoor marijuana grow sites consume an estimated 29.4 million gallons of water per year.
- Researchers estimate over 1.4 million pounds of fertilizers and toxicants are used annually at outdoor marijuana grows sites in California.

### References

<https://www.thenmi.org/wp-content/uploads/2020/12/CA-MJ-IMPACT-REPORT-2020-FINAL-.pdf> (accessed 01/15/2021)



## NEW MSMA MEMBERS!

David Haustein, MD – PMR- Springfield  
Robin Blount, MD – Internal Medicine – Columbia  
Melissa Kroll, MD – Emergency Medicine – St. Louis  
Amit Shah, MD – Allergy & Immunology – St. Louis  
Michael Hellman, MD – Unspecified – Lee's Summit  
Krista Seymour, MD – Internal Medicine – St. Louis  
Christine Ormsby, MD – Diagnostic Radiology – St. Peters  
Kelsey Davis-Humes, DO – Family Practice – Memphis  
Michael Snyder, MD – Neurology – St. Louis  
Rebecca Rezaie, MD – Family Practice – Kansas City  
Sofia Grewal, MD – Geriatric Psychiatry – St. Louis  
Harbaksh Sangha, MD – Critical Care – Osage Beach  
Sandra Johnson, MD – Ophthalmology – Columbia  
Ayman Suleiman, MD – Unspecified – Columbia  
Aaron Webel, MD – Ophthalmology – Columbia  
Brenton Pennicooke, MD – Neurological Surgery – St. Louis  
Jaya Arora, MD – Anesthesiology – Springfield  
David Carr, DO – Unspecified – Springfield  
Tara Swanson, MD – Pediatrics – Kansas City  
Katina Carlson, MD – Pediatrics – Kansas City  
Rinkal Patel, MD – Pediatrics – St. Louis  
Brian McGinn, MD – Pediatrics – Hannibal  
Crystal LaGalle, DO – Unspecified – Kansas City  
Samin Akhtar, MD – Internal Medicine – Kansas City  
Jeffrey Bery, MD – Family Practice – Kansas City  
Jillian Tyler, DO – Family Practice – Lee's Summit  
Valena Fiscus, DO – Internal Medicine – Kirksville  
Lenora Adams, DO – Internal Medicine – Jefferson City  
Pamela McCool, DO – Obstetrics & Gynecology – Clinton  
Debra Howenstine, MD – Family Practice – Columbia  
Lucas Vocelka, DO – Infectious Disease – Kansas City  
Mark Finkelston, DO – Obstetrics & Gynecology – Kansas City  
Kayce Morton, DO – Pediatrics – Springfield  
Allan Anyumba, DO – Obstetrics & Gynecology – Chillicothe  
Ruthanna Hunter, MD – Neurology – Jefferson City  
Christopher Espana, MD – Geriatric Medicine – St. Louis  
Aunita Hill-Jones, MD – Internal Medicine – St. Louis  
Iman Al-Sadan, MD – Obstetrics & Gynecology – Kansas City  
Renato Sandoval, MD – Endoc/Diabetes – Lee's Summit  
Meng Zhao, MD – Internal Medicine – Blue Springs  
Peter Ramsey, MD – Gastroenterology – Springfield  
Megan Gau, MD – Diagnostic Radiology – Bridgeton  
Samuel Temesgen, MD – Psychiatry – Columbia

Mark Gregory, MD – Internal Medicine – St. Louis  
Gregory Miller, MD – Internal Medicine – Chillicothe  
Robert Hagan, MD – Plastic Surgery – St. Louis  
William LaFoe, MD – Cardiovascular – Cape Girardeau  
Elizabeth Laffey, MD – Family Practice – St. Louis  
Piotr Kulikowski, MD – Internal Medicine – St. Louis  
Ovais Zubair, MD – Geriatric Medicine – Springfield  
Karen Thies, DO – Obstetrics & Gynecology – Columbia  
Jennifer Delaney, MD – Internal Medicine – St. Louis  
William Koury, MD – Diagnostic Radiology – Overland Park  
Angela Noto, MD – Radiology – Overland Park  
Christopher Palmer, DO – Pulmonary Critical Care – St. Louis  
Mark Killman, MD – PMR – Independence  
Laura Alba, MD – Gastroenterology – Kansas City  
Algis Babusis, MD – Radiology – Kansas City  
John Patton, DO – General Surgery – Osage Beach  
Tarah Cook, MD – Anesthesiology – Kansas City  
Dustin Woyski, DO – Unspecified – Kansas City  
Linda Proctor, MD – Diagnostic Radiology – Bridgeton  
Rebecca Baskins, MD – Family Practice – N. Kansas City  
Virginia Herrmann, MD – General Surgery – St. Louis  
William Gillanders, MD – Surgical Oncology – St. Louis  
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Stephanie Haupt, MD – Family Practice – Kansas City  
Sara Lowery, MD – Family Practice – Kansas City  
Jane Turner, MD – Pathology – St. Louis  
Earl Beeks, MD – Pediatrics – Clayton  
Kate Grossman, MD – Pulmonary Critical Care – Columbia  
Mitra Boodram, MD – Diagnostic Radiology – Chesterfield

# MSMA Members in the News

Did you make the news? Submit your success story and photo to [lfeenor@msma.org](mailto:lfeenor@msma.org).



**John S. Daniels, MD**, has retired from the clinical faculty of Washington University, Department of Internal Medicine and is stepping down from the Editorial Board of *Missouri Medicine*. Dr. Daniels is Journal's longest serving Editorial Board member having joined the Board in May 1986. Dr. Daniels will still be involved in medical education and clinical practice. The MSMA Publication Committee has bestowed the Distinguished Service Award on Dr. Daniels. Editor John C. Hagan, III, MD, reports that Dr. Daniels has set the standard during his tenure for expert, timely, authoritative peer-reviews, and has worked with many authors to improve the quality of their manuscripts. Dr. Daniels has also been a critical liaison with faculty at Washington University and has been consulted on many matters related to the Journal.

Farina Shafi, MD, FACP, will be the new Internal Medicine Editorial Board member for the Journal. She is an Associate Professor of Medicine at the University of Missouri-Kansas City, is a UMKC Docent, and received the Betty M. Drees Excellence in Mentoring Award in 2020, which acknowledges and celebrates a faculty member who has made significant contributions to enhancing and developing the careers of faculty and trainees as a mentor.



**Steve Reintjes, MD**, is President and Chief Executive Officer of North Kansas City Hospital and its physician network subsidiary, Mertias Health.

The Kansas City Medical Society welcomes **Scott W. Kujath, MD, FSVS, FACS**, as the 2021 president, a vascular surgeon with Midwest Aortic & Vascular Institute. Dr. Kujath is



also the chief of vascular surgery at Kansas City Veterans Administration Medical Center. MSMA congratulates **Betty Drees, MD, FACP, FACE**, on completing her year as KCMS president. Dr. Drees is MSMA Seventh District Councilor, Dean Emerita and Professor of Medicine, UMKC, and President of Graduate School for the Stowers Institute for Medical Research, Kansas City, Missouri.



MSMA members **Bridget McCandless, MD**, and **Jim Wetzel, MD**, were part of a panel for the Kansas City Medical Society's virtual conference on

“Advocating for Your Patients in 2021: How to Lead in a Time of Rapid Change.”

**Michael Moncure, MD**, appears in a Truman Medical Center video endorsing the COVID-19 vaccine, especially for minority communities. He noted the disproportionate impact of COVID-19 on minority communities, and that the vaccine has shown equal effectiveness across races and ethnicity.



Jordan Valley Community Health Center in collaboration with the GCMS, and the Springfield-Greene

County Health Department has developed a Mobile Vaccination Unit (MVU). The MVU is financed by a grant provided by the CARES committee. Jordan Valley Health Center Medical Director **Matt Stinson, MD**, long time GCMS Flu Committee Chair **Jim Rogers, MD**, and GCMS President **Kayce Morton, MD**, are leading the effort to prepare for our eventual COVID conquest by developing an innovative method to deliver COVID vaccines in a rapid and efficient fashion.

**MM**

## Foundation Funds \$270,000 Scholarships to Medical Students

The Missouri State Medical Foundation has been helping medical students to fund their education with MSMA Scholarships for more than 15 years. In 2020, the Foundation presented scholarship funds to each of the six Missouri medical schools totaling \$270,000. Pictured here are scholarship recipients from the University of Missouri - Columbia School of Medicine.



Caitlyn Smith



Emily Bosak



Eric Krause



Erica Diesfeld



Haley Crosby



Jane Edmunds



Kirtan Joshi

### Duplicate Publication: Apologies to *Missouri Medicine* & *GCMS Journal*

To the Editor:

Our article, “Lessons from Contact Tracing in Mid-Missouri” which appears in this issue of *Missouri Medicine* (page 81) was also inadvertently submitted to the *Greene County Medical Society Journal (GCMSJ)* It was published in the *GCMSJ* in November/December 2020, volume 78(6) pages 15-17. The individual that submitted the article has been removed from the *Missouri Medicine* article/byline. We apologize to *Missouri Medicine* and the *GCMSJ* for this error.

Submitted on behalf of the authors,  
Lynelle Phillips, RN, MPH  
Article Corresponding Author

MM

### Letters to the Editor



Submissions reflect readers' opinions and may be edited for length. Use in subject

line: “For Publication”

Email to both Editor and Managing Editor

- drjhagan3@gmail.com
- lflenor@msma.org



# SCHEDULE OF EVENTS

[www.msma.org/annual-convention](http://www.msma.org/annual-convention)

Free Registration/Free CME to Members  
 Resolution Submission Deadline Feb 24  
 Online Resolution Comments Jan 21-April 7  
 Online Reference Committee Comments April 11-15

## THURSDAY, APRIL 8

6:00 pm - MSMA Council Meeting

## SATURDAY, APRIL 10

9:00 am - House of Delegates, First Session

11:00 am - Reference Committees

## MONDAY, APRIL 12



7:00-8:00 pm - General Session 

### "COVID-19 Update"

Alexander Garza, MD, MPH\*  
 Chief Community Health Officer, SSM Health, St. Louis, Missouri  
 Task Force Commander, St. Louis Metropolitan Pandemic Task Force  
 Emergency Medicine, Col. US Army Reserves

## TUESDAY, APRIL 13



7:00-8:00 pm - General Session 

### "Are We Cost Conscious Enough as Clinicians?"

S. Hasan Naqvi, MD, FACP, SFHM\*  
 Associate Chief Medical Officer Missouri University Healthcare  
 Division Director Hospital Medicine & Director Clinical Research Center  
 Internal Medicine, School of Medicine, University of Missouri-Columbia, Columbia, Missouri

## WEDNESDAY, APRIL 14



7:00-8:00 pm - General Session 

### "Role of Health Policy in Improving Outcomes & Equity in Missouri"

Karen Joynt Maddox, MD, MPH  
 Co-Director, Center for Health Economics & Policy, Washington University Institute for Public Health  
 Assistant Professor, Washington University School of Medicine & School of Social Work  
 Cardiology, Barnes-Jewish Hospital, St. Louis, Missouri

## THURSDAY, APRIL 15



7:00-8:00 pm - General Session 

### "Missouri Medicaid Expansion Status Report"

Anthony Brite & Nathan Percy  
 MO HealthNet Division, Missouri Department of Social Services, Jefferson City, Missouri

## SATURDAY, APRIL 17

9:00 am - Presidential Inauguration

Alex Hover, MD, MSMA & Barbara Hover, MSMA Alliance

10:00 am - House of Delegates, Second Session

12:00 pm - MSMA Council Meeting

\*MSMA Member



## 2020 Contributors to Missouri Physicians Health Program

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## Missouri Physicians Health Program Updates

The Missouri Physicians Health Program (MPHP) made several important transitions in 2020.

First, program director Mary Fahey was named interim and then permanent executive director. She succeeds Bob Bondurant, who was MPHP's executive director for over 25 years. Bob died in February 2020 after a long illness.

"For many years, Bob Bondurant was the face of the MPHP serving as its capable executive director," said William L. Woods, MD, chair of the MPHP board of directors. "Since his resignation and subsequent passing earlier this year, the MPHP has been in a state of challenging yet exciting transition complicated, of course, by the COVID-19 pandemic. When Bob became ill last year, Mary Fahey immediately stepped up to fill his shoes, thus preventing any interruption of the MPHP's important mission."

Kay O'Shea has moved into the role of program director, taking on new clinical responsibilities along with keeping her hand in the operations of the program.

In addition, MPHP changed its governance structure effective in August 2020, while remaining closely aligned with the Missouri State Medical Association (MSMA). The MSMA Physicians Health Committee took over as the governing board of MPHP; the committee previously functioned in an advisory role to MPHP staff. Previously, the MSMA board's executive committee served as MPHP's governing board. MPHP is a separate non-profit entity.

Dr. Woods, a Columbia, Mo., cardiologist, added: "There are many physicians out there who need our help but don't ask for it either because they don't know we exist or because of fear regarding their privacy, their physician licensure or their financial security. At MPHP, we are addressing all of these very real concerns with a multi-pronged effort to reach out to troubled physicians and to protect their dignity and well-being."

The MPHP facilitates a physician's return to a healthy personal and professional life through early identification, intervention, treatment referral, long-term monitoring and advocacy. It is available to all Missouri physicians, physicians in training, and medical students.

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## Donate to MPHP

In honor of former Executive Director Bob Bondurant's life-long commitment to physician health and wellness, we ask that you too make a donation to the MPHP.

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# Ellis Fischel, MD: Cancer Surgeon, Humanitarian and Innovator

Founded free state cancer hospital in Columbia, now part of MU Health Care

by Arthur Gale, MD

A traveler passing through Columbia, Mo., along Interstate 70 could not miss seeing a seven-story building which originally had horizontal stripes that many thought resembled a chocolate layer cake. This building was the Ellis Fischel Missouri State Cancer Hospital.

Who was Ellis Fischel and why was the hospital named after him? Ellis Fischel, MD, was born in 1883 in St. Louis. His father was Dr. Washington Fischel, a prominent internist. In 1904, the year of the St. Louis World's Fair, he married Marguerite Kauffman. They had two children, one of whom was paralyzed from birth. Marguerite composed music and wrote a book, *The Spastic Child*, which went through three editions.

Dr. Fischel came from a family that was well-to-do and civic-minded. His sister Edna Gellhorn was involved in many causes. She was a founder of the League of Women Voters and was a leader in the women's suffragist movement. Her daughter Martha Gellhorn was the only female journalist who landed on



the Normandy coast on D-Day of World War II. She accomplished this feat by hiding in a bathroom. She was also the third wife of the author Ernest Hemingway.

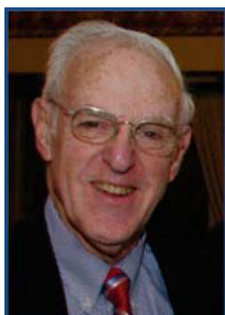
The Fischels were part of group of socially conscious, philanthropic prominent citizens of St. Louis. They felt a responsibility to care for the poor, the sick, and oppressed. It is likely

that this cultural background inspired Ellis Fischel to establish a free cancer hospital for the indigent citizens of Missouri.

Ellis Fischel (pronounced Fish-ELL) enrolled at Harvard University in 1900. He played on the university's baseball team. He was a classmate of Franklin Delano Roosevelt, the thirty-second president of the United States. He graduated from Washington University School of Medicine, completed a two-year internship at St. Louis City Hospital, and then studied abroad.

Dr. Fischel became a surgeon and eventually rose to become associate professor of clinical surgery at Washington University. Early in his career, Dr. Fischel taught anesthesia, fractures, and plastic surgery. After he began treating cancer at a charity hospital in St. Louis he wrote, "Chance led to the surgical service at a charity cancer hospital-service which has given me the greatest individual satisfaction and stimulation to greater endeavor."

He treated cancer in every part of the body including the brain. He was among the first physicians to use radium as treatment against cancer. During his



Arthur H. Gale, MD, is a *Missouri Medicine* Contributing Editor. He is a retired Internal Medicine physician in St. Louis. He recently received the *Missouri Medicine* Distinguished Editorial Service Award.  
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25 years in private practice, Dr. Fischel cared for 1,208 cancer patients, 519 of which reached the milestone of surviving five or more years. He cared for countless more charity patients—perhaps as many as 10,000. He taught at both Saint Louis University and Washington University.

### Founding the Hospital

As a member of the Missouri Medical Association's Cancer Committee, Dr. Fischel persuaded the American Cancer Society to conduct a statewide cancer survey. The results showed that many poor Missourians were in need of cancer care.

Armed with this survey and with his experience in caring for cancer patients, Dr. Fischel asked elected officials to support his plan to build a state cancer hospital. The plan was approved and construction began in 1938. Ellis Fischel was named the first chair of Missouri's Cancer Commission. The hospital would be the first cancer center west of the Mississippi.

Dr. Fischel did not live to see the completion of the hospital. Tragically he died in an automobile accident in Useful, Mo. He was on his way to a Cancer Commission meeting. He was 53 years old.

The new hospital was to be named after Missouri Gov. Lloyd C. Stark. But Stark insisted on naming the state hospital for Ellis Fischel. Stark told a reporter, "I will appreciate very much your mentioning the fact that after Dr. Fischel's death I asked that the name be changed from mine to his because, in my opinion there never would have been a state cancer hospital except for Dr. Fischel's untiring efforts."

The 1930s marked a different era. In this day and age of bloated political egos, a magnanimous gesture like Gov. Stark's would be very unlikely.

The Ellis Fischel State Cancer Hospital was gradually integrated into the University of Missouri Medical Center. In 2013, it officially moved to a new facility on the main campus and became the Ellis Fischel Cancer Center.



Ellis Fischel Missouri State Cancer Hospital (above) as it appeared shortly after opening in 1940. In the 1970s, the exterior was recolored and a large addition made (below).



Ellis Fischel wrote how he personally felt about his life: "The greatest interest in life, as I have found it, is my daily contact with my fellow man, both in health and disease. The greatest rewards come through what we personally mean to a few obscure individuals. The greatest thrill is from public recognition of work well done."

To learn more about Ellis Fischel, MD, view a short video on the MU website at [bit.ly/fischel-history](http://bit.ly/fischel-history).

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# Keep the Pharmacist, Cut the Middleman

by Anne Eisenbeis, PharmD & Kristin Hoff

Pharmacies and pharmacists are not the problem, but rather are a solution to decrease health care costs while increasing access to care and quality of care for patients. Pharmacists are one of the most underutilized, yet accessible, health care providers. They are ubiquitous across health care settings including hospitals, clinics, and long-term care and community settings to support patients across the continuum of care.

If you really want to increase compliance in order to ultimately bring down the cost of care, the solution isn't cutting out the pharmacist, it's adding the pharmacist to your team. Pharmacists are known as the medication experts and for good reason. When a prescription enters the pharmacy, the pharmacist is responsible for reviewing each medication prescribed to the patient against the patient's profile to assess for both safety and efficacy. This is known as a drug utilization review (DUR). During this process, the pharmacist checks for drug-interactions, allergy alerts, disease-state interactions, duplications in therapy, and safe therapeutic dosage window for the patient based on their age, weight, and disease state.

Additionally, the pharmacist physically verifies the medication to ensure correct medication, patient, dose, time, and route. This entire process is completed before the medication is dispensed to the patient, but the pharmacist's job is not over. Once the patient arrives to pick up their prescription the pharmacist offers counseling and answers any questions the patient may have. Pharmacists provide important safety checks that would be eliminated if physicians dispensed from their office. They also provide important patient

education that can make or break the effectiveness of the medication therapy.

The pharmacy is often the most centralized hub for an up to date and accurate medication list. While patients often utilize multiple providers, one pharmacy is used to fill the majority of their prescriptions. The pharmacy is a great resource for both patients and providers when there is a medication-related question. Furthermore, pharmacies have extended hours compared to most physician offices and pharmacists are very accessible through a phone call or visit to the pharmacy location. Pharmacists also help facilitate transitions of care between physicians and other providers and different health care settings to ensure the patient's medication list is safe and accurate. Physician dispensing would remove this important and complementary pharmacy service.

Pharmacists also play an important role in increasing medication adherence. A quick look at a patient's fill records can identify compliance discrepancies that a pharmacist can discuss with the patient. Pharmacists have far more interactions with patients when compared to physicians, which allows them to address medication compliance more frequently. Increased medication adherence leads to a decrease in overall medical costs.<sup>1</sup>

Another key role of the pharmacist is to administer immunizations and increase immunization rates. Pharmacy-based immunization services have shown to be more cost-effective for patients and insurers compared to physician office based vaccine delivery.<sup>2</sup> Patients may also find it more convenient to receive a vaccination or pick up a prescription at the pharmacy where appointments are not required and hours are often extended into the evening.

The cost of care can actually decrease while the quality of care increases by adding a pharmacist to your team. Medication errors are one of the most common medical errors leading to higher cost of care for the patient and potentially lower reimbursement to the provider. Pharmacists are not only one of the most accessible health care providers to patients, they are also available to share medication expertise and resources with other care provider team members.



Anne Eisenbeis, PharmD, (left), is Director of Practice Development, Missouri Pharmacy Association, Jefferson City, Missouri. Kristin Hoff is a candidate for PharmD at the University of Missouri-Kansas City School of Pharmacy, Kansas City, Missouri.

A common misconception is that consumer medication pricing is at the discretion of the pharmacy or the pharmacist dispensing the medication. In reality, consumer costs for medications are determined by a Pharmacy Benefit Manager (PBM). The PBM is the middleman between the health insurance plan and the pharmacy. The PBM determines how much the patient will pay and how much the pharmacy will be reimbursed for the medication dispensed. The PBM also pays the pharmacy a dispensing fee, which is typically no more than a few dollars per prescription. Surprisingly, pharmacies can even lose money on a prescription if they pay more to purchase the drug from their distributors than what is reimbursed as payment to dispense it by the PBM. Under this current model it is unlikely that physicians would be able to dispense medications at cost as the article suggests because they would risk losing large amounts of money, if they intended to bill the patient's PBM as the pharmacies do.

In conclusion, pharmacists don't raise health care costs, and adding a pharmacist to your team would actually lead to the opposite. It could also potentially lead to increased reimbursement for your clinic or facility as the pharmacist on your team may help in raising the scores on your quality metrics. Add a pharmacist to your team and you won't be disappointed.

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[Editor's Note: This article is in response to a *Wall Street Journal* article on June 11, 2020, titled "Letting the Docs Dispense: Should patients have to make a trip to the drugstore to fill a prescription?" <https://www.wsj.com/articles/letting-the-docs-dispense-11591918907>]

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# Burnout in Physicians and the Role of Leadership

by Steven Zweig, MD

**Fostering a strong sense of purpose, coupled with a culture that supports rather than impedes professional success, are meaningful ways in which leaders can help prevent burnout.**

**B**urnout is a loaded term – first established by Maslach as a concept combining being emotionally exhausted, having a lack of self-efficacy, and experiencing depersonalization.<sup>1</sup> There have been varying ways of describing and measuring this phenomenon – and it has been found to be increasingly prevalent in physicians.<sup>2</sup> Regardless of its specific definition, there is general agreement that something is often wrong in medicine. Various attributes are attributed to the characteristics of employment, the weight of administrative burden, or the challenge of the electronic medical record<sup>3</sup>, burnout has resulted in job dissatisfaction, self-doubt, substance abuse, and depression.

This series of articles on burnout describes well this phenomenon and strategies to deal with it at the level of an academic health system, student well-being, physician mental health, a community-based physician wellness program, and a program of peer support. These are meaningful and serious attempts to both understand and address this vitally important subject.



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While the profession is challenged broadly, both women and members of minority groups, especially Black physicians, are disproportionately affected by bias in medicine which leads to additional suffering. Even though more women than men are currently entering medicine, women are often underpaid and not represented in leadership roles.<sup>4</sup> Furthermore, they disproportionately shoulder the challenge of balancing a career with child rearing. The COVID pandemic has exacerbated the challenges of working women who are now asked to both care for and supervise the teaching of their homebound school-aged children. Physicians of color, particularly Black men and women physicians, suffer both microaggressions and outright racism in all levels of their professional careers.<sup>5</sup>

If burnout is to be prevented, our focus should be in restoring and sustaining well-being. As dean of our medical school, I and my department chairs, medical directors, faculty and hospital leader colleagues, are responsible for physicians at all levels of the profession: students, residents, and faculty physicians. While we cannot solve all the problems of organized medicine or relieve the very real challenges intrinsic to the responsible role of the physician, leaders can have impact by establishing a culture that supports human beings in this important work. It starts with

respect for individual differences and recognition that diversity, followed by inclusion and equity, makes us more capable of fulfilling our professional responsibilities. Valuing the contributions of each person to the complex mission of an academic health system means that teaching, patient care, and research are all acknowledged. Policies and communications should both be fair and transparent. Curiosity and learning are ongoing experiences in this culture which can both reduce burnout and drive excellence in performance. Empathy coupled with accountability supports the unique contribution of each physician, while demanding the expert care expected of the profession.

Instrumental steps that organizations can take to help include: supporting the practice environment, nurturing community, enhancing local control, and selecting and developing leaders with skills in fostering physician engagement.<sup>6</sup> Helping physicians to know what is expected of them using communication strategies and dashboards reduces ambiguity and reinforces mission, vision, and values. Visualizing “my best day at work” can help put into place the pieces that reinforce a sense of achievement and connection to the people at work. Opportunities for all physicians to lead from where they are, help to restore self-efficacy.

Strategies for resilience include highly functioning teams, time for family, friends at work, and self-care (diet, exercise, sleep, prayer, meditation, avoidance of addicting substances, etc.).<sup>7</sup> There is joy in practice that we must all help each other achieve.<sup>8</sup> Part of that joy comes from finding meaning in the work of being a physician. Incorporating practices of reflection and appreciation can affirm that joy. By supporting



**Burnout Definition:** Variously attributed to the characteristics of employment, the weight of administrative burden, or the challenge of the electronic medical record, burnout has resulted in job dissatisfaction, self-doubt, substance abuse, and depression.

a positive culture and inclusive mission, leaders can help their members feel like they are part of something larger than self. Fostering a strong sense of purpose, coupled with a culture that supports rather than impedes professional success, are meaningful ways in which leaders can help prevent burnout.

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# Clinician and Researcher Well-Being: The Time is Now

by Stephen T. Keithahn, MD & S. Craig Rooney, PhD

This edition of *Missouri Medicine* addresses a growing threat to our health care system: physician burnout. Most physician readers have either experienced burnout firsthand or have had a colleague who has suffered from burnout. And too many of us have known colleagues who have died from suicide with burnout either causing or contributing to their deaths. Over the past year, the COVID-19 pandemic has only exacerbated this already significant problem. Few physicians can remember a time in their careers when health care worker well-being has been so challenged...and is also so critically important!

Burnout is not a new condition but has long been a potential consequence from the stress and expectations of working in the “helping professions” during modern times. The term was first used in the 1970s by Herbert Freudenberger<sup>1</sup> and has since been expanded to encompass anyone with situational stress creating the triad of symptoms: emotional fatigue, cynicism, and inefficacy.<sup>2,3</sup> While symptoms overlap with those of depression and experts don’t always agree on exactly the definition, burnout is always work related.<sup>4</sup> The World Health Organizations included burnout for the first time in the ICD-11 in 2019 and defined it as “chronic workplace stress that has not been successfully managed.”<sup>5</sup> Sadly, physicians have higher burnout rates than the general population.<sup>6</sup>

Research suggests that the incidence of burnout in physicians has been increasing over the past decade as have the consequences of burnout on them, their patients, and the health care institutions in which they work.<sup>7</sup> Those on the front lines (i.e., emergency medicine, family medicine, neurology, and general internal medicine) suffer the most.<sup>8</sup> While some may be quick to blame this rise on younger generations of physicians, studies have shown that incoming medical students actually have higher resilience and quality of life scores than other graduate students.<sup>9</sup> Unfortunately, they lose this advantage during medical school, and the incidence of burnout increases in early career physicians, especially residents, and is more prevalent among female physicians.<sup>17,10</sup> Interestingly, work-life balance does not appear to be the sole driver. For example, emergency physicians report a high satisfaction with their work-life balance, but as a group suffer some of the highest incidence of burnout.<sup>11</sup>

Scholars have identified multiple factors and stressors that could account for greater rates of burnout among female physicians that need to be considered not only for moral reasons but because women account for 50 percent of U.S. medical students.<sup>12</sup> Fewer studies have been done on physicians from racial or ethnic minority groups, but a recent investigation found that burnout was highest among non-Hispanic, white physicians and higher among physicians holding more explicit and implicit racial biases.<sup>13,14</sup> It is critical for further research to examine diversity variables if we are to attract and retain the most talented workforce in health care systems.




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While burnout was once thought to be primarily caused by a lack of resilience in the individual or simply by the demands the EHR, much research suggests that burnout is largely caused by larger environmental variables in physicians' work lives such as clinic environment, workload control, long work hours, time with family, and an alignment of values with leadership.<sup>15</sup> Possibly reflective of this, a meta-analysis of physician burnout interventions suggested that interventions that only target individual physicians and not their organizations yield only small changes in burnout.<sup>16</sup>

What circumstances and factors have led to this increasingly challenging work environment for so many physicians? Unfortunately, the answers may be largely beyond the direct control of physicians themselves: health care policy, societal impact on patients, and the health care industry. Several physicians' surveys cite increasing administrative burdens.<sup>17</sup> One study demonstrated that for one hour of patient contact in a primary clinical setting there existed two hours of administrative work.<sup>18</sup> Federal mandates have incentivized the widespread adoption of the electronic health record, a trend which has obvious benefits for patients and physicians but has also increased the administrative workload for physicians. Compared to most other countries, the patient record increasingly has become a billing document over a patient care and legal document. Federal pay for performance measures such as MIPS and MACRA require extra physician time in the EHR for benefits that are still uncertain.<sup>19,20</sup> One scholar even suggested that U.S. physicians' documentation is "four times longer" than clinical notes in other industrialized countries.<sup>21</sup> All of this at a time when declining reimbursement from payers has pressured institutions and physicians to see even more patients per hour. And, our patients have more chronic physical and mental health conditions than ever. A large number of patient complaints in primary care settings now involve mental health concerns or have psychological components.<sup>22</sup> The challenges of responding to the opioid crisis, at times, seem almost insurmountable. And physicians are under more scrutiny than ever. One negative patient satisfaction report can be demoralizing to even the most resilient clinician.

The consequences of ignoring burnout in clinicians are substantial. Struggling physicians provide lower quality and less safe patient care. Not surprisingly, their

patients are less satisfied with the care they receive.<sup>23</sup> The behavior of these physicians may be toxic to their care team. Fatigued physicians often decrease their schedule and access. The human costs of burnout on physicians are also substantial. Physicians as a group have poorer mental health than that of the general population, but physicians suffering from burnout have an even higher incidence of broken relationships, alcohol and substance abuse, depressions and suicide.<sup>24,25</sup> It is estimated that between 300-400 U.S. physicians take their lives each year; double that of the general population and representing one of the highest rates of any professional group.<sup>26</sup>

Burnout in physicians also affects the institutions in which they work. One study estimates the annual U.S. physician burnout costs to be around 4.6 billion dollars.<sup>27</sup> Struggling physicians often reduce their productivity and professional effort just to survive and often end up leaving their institutions. One industry group suggests that the cost for an institution to replace a physician could be as high as one million dollars when factoring in lost revenue with recruitment and startup costs.<sup>28</sup> And often it's the physicians who care the most who leave as they are not willing to tolerate a dysfunctional work environment. Academic medical centers and their accreditation agencies have learned that faculty burnout affects the learning environment. The ACGME and LCME now assess faculty burnout as part of their learning environment evaluations.<sup>29,30</sup>

Physician burnout has such a significant impact on physicians, patients and the overall health care that several physician organizations advocate for creating a "quadruple aim" by adding "improving the experience of providing care" to the triple aim of improved patient experience, lower costs, and better outcomes.<sup>31</sup> Indeed, the critical importance of a healthy and high functioning clinician work force has led academic and private health care institutions across the country to develop physician wellness programs led by chief wellness officers as advocated by Stanford, the AMA and others.<sup>32,33</sup>

Since the policies and societal features that drive burnout will be slow to improve and could even worsen, efforts to reduce physician burnout and to enhance physician well-being have focused on developing a culture of wellness, optimizing clinical efficiencies, and promoting physician resilience<sup>34,35</sup> (Figure 1). For at its core, burnout is an imbalance of job demands and resources. Difficult work schedules,

Figure 1. Stanford WellMD Professional Fulfillment Model



Source: Stanford WellMD Center

unreasonably workload, “administrative burden,” poor staffing, unfriendly technology, ineffective workflow, “moral distress,” patient variables, and invasion into personal time all add to the demands of serving as a physician. Several strategies that have been shown to offset these demands include optimizing practice efficiency, creating meaning and purpose in work, developing a positive organization culture while aligning values, setting expectations but allowing for job control and autonomy wherever possible, providing rewards and recognition, fostering more collegial relationships and social networks, and nurturing “work-life integration.”<sup>36</sup>

The idea for a University of Missouri physician well-being initiative began in 2016 with discussions within the School of Medicine’s University Physicians Professionalism and Quality Committee. Several committee members questioned whether burnout was a contributing factor to professional lapses. The committee advocated for a physician well-being program build as detailed in the AMA’s 2017 STEPSforward (Table 1). In September 2018, the Office of Clinician Well-Being (OCW) and the Chief Wellness Officer position were created and co-funded by University of Missouri Health Care (MUHC) and the MU School of Medicine (SOM). In March of 2019, optimizing clinician well-being was incorporated into the MUHC strategic plan, and the first formal

budget for the OCW was authorized. Office space was secured, and a counseling psychologist/program director as well as an administrative assistant were hired during the summer of 2019.

While initially targeted at physicians, the OCW has been expanded to encompass faculty, fellow and resident physicians, advance practice clinicians, as well as SOM faculty researchers since each of these groups are critical to the missions of SOM and MUHC. The current mission of the OCW is “Saving and Improving Clinician and Researcher Lives,” but the overall theme of the initiative is for leadership to partner with clinicians and researchers to make MUHC/SOM a great workplace for everyone while encouraging all to practice self-care and to reach out when they need support. To that end, the University of Missouri OCW devotes time both to providing a clinician safety net of counseling and consultation services modeled after an EAP and to the development of programs that seek to tackle structural components of burnout. Members of the OCW are included in regular high-level meetings including strategic planning session so we can be “at the table” to raise issues of clinician well-being throughout major organization decisions and considerations.

As the drivers are many and complex, there is no sole intervention that will mitigate burnout. The following is not an exhaustive list of interventions but highlights accomplishments and future plans. Measurement of burnout over time is fundamental and while employee engagement surveys had been conducted annually, the OCW engaged the AMA to administer the first formal clinician burnout survey at MUHC, the Mini-Z, in November/December of 2019. The results not only indicated the degree of burnout but also gave insight into strategies that may improve well-being. To reduce EMR stress, the OCW advocated for single badge sign on or “tap ‘n go” for EMR workstations. This technology was put into place during the winter of 2019-20 and is saving precious work time for every user. Strategies to optimize EMR training such as “at the elbow” mentors should also limit the time spent in the EMR. Recognizing and rewarding clinicians is another important strategy to improve and maintain well-being. The OCW is a member of a SOM committee examining faculty compensation and benefits to ensure fairness, aligned incentives, and an overall package competitive with national standards. Within this committee, the





Table 1. AMA's Creating the Organizational Foundation for Joy in Medicine™

**Culture of Wellness**

- Step 1. Engage senior leadership
- Step 2. Track the business case for well-being
- Step 3. Resource a wellness infrastructure
- Step 4. Measure burnout and the predictors of burnout longitudinally
- Step 5. Strengthen local leadership
- Step 6. Develop and evaluate interventions

**Practice Efficiency**

- Step 7. Improve workflow efficiency and maximize the power of team-based care
- Step 8. Reduce clerical burden due to the HER

**Resilience**

- Step 9. Support the physical and psychosocial health of the workforce

OCW is advocating for time spent on messages to be considered when calculating clinician FTE as attention to inbox messages has added to the workload of all physicians, especially those in primary care. Upgrades to the physicians' lounge and to the annual Doctor's Day celebration are tangible symbols of leadership's support and appreciation of clinician work. Physician leadership is not only integral to physician well-being but also to the overall mission of a health care institution. Simply stated, what physician leaders do and say really matters. The OCW has provided physician leadership development programming to physician leaders and is developing an ongoing program to enhance and maintain leadership skills and culture as well as to grow the next generation of physician leaders. The importance of communication between leadership and physicians cannot be overly stressed but remains a significant challenge. The recent widespread adoption of virtual platforms may facilitate the flow of information and ideas, but other strategies are needed. Optimizing the efficiency of the work environment for all physicians is a lofty but critical goal and will always be a component of the well-being strategy. The OCW is teaming with members from hospital administration to ensure that social work and care coordination resources are available in key clinical areas. Strengthening collegiality between physicians and clinical units also enhances well-being. A gap analysis is underway to assess needs in these arenas.

With the onset of the COVID-19 pandemic, the OCW immediately pivoted to address the needs of clinicians. Clinicians were offered telepsychology appointments with the OCW counseling psychologist to minimize additional exposures to the virus. This technology has also been popular because it reduces the time clinicians must travel to and from appointments,

reducing an additional barrier to seeking help. The OCW has been heavily involved in a Workforce Well-being ad hoc committee – founded in the early days of the pandemic – that consists of multidisciplinary professions from across MU Health Care. Their presence on this committee facilitated the involvement of other clinicians in psychiatry and

various specialties within psychology. The OCW began compiling COVID-era resources specific to clinicians on their website.<sup>37</sup> Additionally, the OCW has continued to advise leadership on matters related to clinician well-being specific to the new stressors related to COVID-19 and have made itself available for consultations, presentations (locally and nationally), bringing together a network of local supports and professionals, and assisting in the development of new means of community-building and wellness concepts throughout the organization.

We hope that this *Missouri Medicine* issue will inspire you to enhance your own well-being as well as those around you and the clinical entities where you serve. We are excited to be able to present four additional articles on burnout and well-being from an outstanding pool of authors, introduced briefly here in alphabetical order.

William R. Carpenter, DO, is a psychiatrist and has been medical director of the Missouri Physician and Healthcare Professional Wellness Program since 2016. He is currently the Chief Wellness Officer at Capital Regional Medical Center. Jim Wieberg, MEd, LPC, is the executive director of the physician wellness program at Capital Regional Medical Center. Heather Johns, LCSW, is the program director of the physician wellness program at Capital Regional Medical Center.

Sue Scott, PhD, RN, is a nurse scientist and Adjunct Associate Professor in the Sinclair School of Nursing who pioneered peer support programs and is a nationally recognized expert in the field.

Stephanie Bagby-Stone, MD, is an Adjunct Associate Professor of Clinical Psychiatry at the University of Missouri School of Medicine and has been working directly with medical students on well-being and resilience for decades.



Stuart Slavin, MD, MEd, is the Senior Scholar for Well-being at the ACGME and former Associate Dean of Curriculum at the Saint Louis University School of Medicine. He brings a broad range experience at both the state and national level.

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## Disclosure

None reported.

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# The Missouri Physician and Health Professional Wellness Program: A Comprehensive Resource for Physician Wellness

by William R. Carpenter, DO, James Wieberg, LPC & Heather Johns, LCSW



**We have seen evidence that when we get involved early and the physician cooperates and is guaranteed confidentiality, four out of five situations can be corrected, voluntarily and confidentially and don't have to involve discipline by the licensing boards.**



William R. Carpenter, DO, FASAM, (above), is the Chief Wellness Officer and Medical Director and Psychiatrist, Physician Wellness Program at the Capital Region Medical Center. James Wieberg, LPC, is a counselor at the Center for Mental Wellness. Heather Johns, LCSW, practices at the Capital Region Medical Center. All are in Jefferson City, Missouri.

## Abstract

**Burnout is just one of many ways that physicians unintentionally become impaired. This article reviews the relevant literature and issues facing physician wellness and presents information about the Missouri Physician and Health Professional Wellness Program sponsored by the Missouri Association of Osteopathic Physicians (MAOPS) and Capital Region Medical Center in Jefferson City, Missouri. Considerations for when to reach out in addition to information on some of the program's preventative services are provided.**

## Introduction

The National Wellness Institute defines “wellness” as “a conscious, self-directed and evolving process of achieving full potential.” Wellness involves attempting to fully integrate and balance approximately eight dimensions including: intellectual, emotional, physical, environmental, financial, occupational, spiritual, and social.<sup>1</sup> Wellness can be compromised when any of these dimensions are suboptimal. In healthcare, multiple occupational factors have made wellness more difficult to achieve.<sup>2</sup> What were once more resilient

and happy medical students (in comparison to equivalent graduate students in other disciplines) are now showing higher rates of burnout and depression during medical school and residency.<sup>3,4,5</sup> Starting a career with elevated competition, an intimidating hierarchy, increased risk of isolation, limited training on how to manage stress or the emotions associated with difficult cases, and significant student loan debt doesn't help. In cohorts of early career physicians, there is twice as much burnout compared to non-physicians of the same age.<sup>6</sup> With 50% or more of physicians having experienced burnout, the primary problem is likely not the individual (although personal characteristics common to physicians may contribute).

Physicians are already wired for high achievement, have difficulty setting healthy boundaries and managing work-life balance, and tend to stigmatize mental health with a fear of appearing “weak.” Still, burnout is due to the combined interaction of the individual, the work environment, and the external influences that impact that work environment. Maslach and Leiter have categorized six main organizational drivers of burnout in their research,



which include: excessive workload, loss of control, ineffective leadership, insufficient rewards, absence of fairness, breakdown of community, and mission-values mismatch. Our current electronic health record (EHR) system and national billing and documentation standards demand considerable time entering data and performing administrative tasks, limiting the quality face-to-face time with patients that often is a driving motivation for entering the profession. Furthermore, the challenges of ICD-10, HCAHPS, Meaningful Use, and changing reimbursement models make it difficult to avoid, or at least considering, abandoning the current conventional medical system altogether (see *The Evolution of Medicine* by James Maskell). Higher risks of medical mistakes, lower quality of care, decreased employee and patient satisfaction, increased employee absenteeism and physician turnover, and decreased work production are just some of the consequences of burnout.<sup>7-10</sup> Worse yet, prolonged distress and burnout can lead to broken relationships, depression, anxiety, substance use, and suicide.<sup>11</sup>

### Burnout and Impairment

Burnout is just one of many ways that physicians unintentionally become impaired. Impairment interferes with the ability of a physician to carry out patient care responsibilities safely and effectively and often impacts a physician's personal life as well. Impairment also may occur as a result of a substance use disorder, mental illness, or a reduction in cognitive or motor ability from age or disease.<sup>12,13</sup> In regards to substance use disorders, the lifetime prevalence of a physician misusing a substance is around 10-15%.<sup>14</sup> Alcohol use disorders are the most common, but prescription drug abuse (i.e. opiates, benzodiazepines, stimulants) is also of concern given that physicians have greater access to these medications. Substances are often used by physicians to try to help manage distress. Female physicians appear to be at higher risk of substance use, in addition to higher risk for depression and suicide.<sup>15,16</sup> A recent meta-analysis of male and female physician suicidality showed that although the suicide rates were similar (~5.4-5.5 per 100,000 population), suicide made up a higher proportion of all-cause mortality in female physicians compared to women in general.<sup>17</sup> According to David J. Skorton, MD, the President and CEO of the Association of

American Medical Colleges, "our country will face a significant shortage of physicians in the coming years. The challenge of having enough doctors to serve our communities will get even worse as the nation's population continues to grow and age." With this anticipated insufficiency, we cannot afford to have any physician become impaired or worse yet, end their life. So how do we help a physician and health professional workforce that is suffering and unhappy?

### Physicians Health Programs in Missouri

One option is with a Physician Health Program (PHP). A PHP is an "early warning system" that watches for potential hazards and helps plot a different course for doctors who fall anywhere on the spectrum from distressed, to burned out, to impaired so they can get treatment and return as quickly as possible to doing what they do best: taking care of their patients. In the state of Missouri, there are two Physician Health Programs. Many readers are likely aware of one of these programs sponsored by the Missouri State Medical Association — the Missouri Physicians Health Program, accessed at <https://www.themphp.org>. An alternative to this option is the Missouri Physician and Health Professional Wellness Program, sponsored by the Missouri Association of Osteopathic Physicians (MAOPS) and Capital Region Medical Center. Our program was created in 1987 by James Wieberg, LPC, in response to the request of the Osteopathic Association to provide well-being and interventional services to physicians (both DOs and MDs) and their families. In 1990, the mission was expanded to include all allied health professionals licensed by the Board of Healing Arts at the request of the Missouri Board of Healing Arts. Sharing our expertise with other allied health professionals follows our code of ethics. Our program is aimed at addressing the needs of those professionals who find that their personal problems are interfering with their ability to do their jobs. Since 1987, we have averaged between 35-45 medical professionals in our program at any one time.

From Jim Wieberg: "Our mission is to remind medical professionals that when the wheels run off the bus they do not have to suffer alone. We are a resource out there to advocate and care for them."

The Missouri Physician and Health Professional Wellness Program has developed a set of guidelines that determine protocols for interventions,



treatment recommendations, drug screens, and aftercare. Those guidelines are modeled after the guidelines of the Federation of State Physician Health Programs as established by the American Medical Association. Our focus as a program is on prevention, early identification, intervention, treatment, and rehabilitation of health care professionals who may be affected by substance use, mental health issues or disruptive behavior, burnout, or impairments related to aging. Treatment for such issues is accomplished at Board-recognized programs that primarily treat healthcare professionals. Determining who needs treatment is evidence-based and if impairment is suspected, a full evaluation is completed by a program approved by the relevant licensure board. Treatment is more extensive and intensive for physicians than the general population, given that they care for others and therefore carry more risk. Physicians are also monitored more closely. All this leads to a recovery rate higher than that for the general population. When impairment is significant, PHPs want to make sure that recovery is solid and lasting before the physician goes back into full practice. PHPs are a safe place to refer to and typically the sooner we get involved the better the result. We receive self-referrals, family referrals, hospital referrals, and referrals from attorneys.

Physicians who may be working alongside a distressed, burned out, or impaired colleague should consider taking action. A stepwise approach is usually recommended, which may begin with an upfront and direct conversation with the physician if it is unlikely that they are causing patient harm. If there is concern for either previous or imminent patient harm, a report to licensing boards (often anonymously) or a clinical supervisor is instead advised.<sup>18</sup> Physicians often have sophisticated denial with elaborate justification and rationalization, making intervention more difficult.<sup>19</sup> Gender may be an issue, as it appears female physicians with a substance use disorder (SUD) are not referred for treatment as frequently as male physicians.<sup>20</sup> Specific potential ramifications of not intervening include: putting the physician's patients at risk of harm and subjecting the physician to potential professional or legal sanctions, denying the physician an opportunity for treatment, and worsening the long-term effect of the impairment on the physician's family, career, or personal health.<sup>21</sup> When PHPs catch potential impairment and begin physician treatment

early, success rates are high. In a previous study, 81 percent of physicians who finished their treatment program kept sobriety for five years.<sup>22</sup> The best success comes when physicians are supported and monitored over the long term, and that's a primary feature of the PHP.

### Characteristics of the MAOPS PHP

Confidentiality in a PHP is vital because a physician's reputation, career, and license can be jeopardized, and physicians will seek treatment and will do so earlier from such programs. With confidentiality, PHPs have the ability to address potential problematic behaviors before they begin affecting patients, plus treatment is quicker and more effective.

"Our goal is to heal the physician and protect the public, and with confidentiality, the results are dramatically better. We have seen evidence over and over that when we get involved early and the physician cooperates and is guaranteed confidentiality, four out of five situations can be corrected, voluntarily and confidentially, and don't have to involve discipline by the licensing boards," reported Weiberg.

In order to further encourage physicians to reach out for help and support a culture of confidentiality, our program has advocated with the Missouri Board of Healing Arts to remove or revise questions on license applications to avoid discrimination and additional scrutiny by focusing on asking questions that primarily identify active impairment.

Another distinguishing characteristic of our program, in comparison to the MSMA PHP, is the proactive and preventative approach we also take with physician well-being. In this age of COVID-19, we adapted quickly to make additional wellness resources available to help physicians maintain resilience, while assessing the level of stress physicians were experiencing with an American Medical Association-sponsored COVID-19 caring for caregiver's survey. Our prevention and wellness services have also included various talks and lectures at medical schools, healthcare organizations, and other conferences. At the medical school level, we strive to help foster a curriculum that promotes wellness as a core professional value and attempt to bring awareness of our program while



destigmatizing services. In 2018, we started an annual physician wellness retreat (see <https://www.maops.org> for more details). Other preventative and early intervention services include additional counseling and physician coaching for distressed physicians and/or their families that have not reached the level of impairment but who might benefit from constructive feedback on how to improve their wellness. Goals of physician coaching may include: improving self-awareness, fostering creative problem-solving, challenging self-defeating thoughts and beliefs, aligning individual values with professional responsibilities, maximizing inner knowledge and skills to better navigate challenges, creating an accountability partnership, and/or creating actionable short- and long-term goals consistent with clients' strengths and values. Randomized controlled studies have shown that physicians who receive professional coaching have a substantial improvement in emotional exhaustion and general symptoms of burnout, as well as an increase in quality of life and resilience.<sup>23</sup>

The MAOPS Physician and Health Professional Wellness Program is monitored by a Board of Osteopathic Physicians and Allied Health Professionals who meet quarterly to assess client progress and determine program direction. It is of our opinion that physicians and healthcare professionals in the state of Missouri should not only receive the education that two Physician Health Programs in the state of Missouri exist, but also should have the liberty to choose when it comes to which program they want to represent them. Our program functions on the integrity of our reputation and entirely on donations with a limited budget. It is maintained by a team with extensive knowledge and expertise in wellness, burnout, physician health coaching, addiction, case management, therapy, and mental health. We appreciate and need ongoing financial support not only to allow us to continue providing acute interventions to those who are impaired, but also to continue expanding our outreach to organizations and medical schools around the state providing vital preventative measures to keep our workforce well throughout their training and career.

We hope to have the opportunity to visit and speak with you about our program. Thanks for reading, and best wishes towards the pursuit of

wellness. Reach out confidentially to the MAOPS Physician and Health Professional Wellness Program at 573-632-5562.

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## Disclosure

None reported.

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# The Pandemic's Toll—A Case for Clinician Support

by Susan D. Scott, PhD, RN



Peer support is one of the most essential, evidence-based interventions healthcare institutions can implement.



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## Abstract

**Healthcare providers perform lifesaving work in unusually stressful work environments due to the challenges and related risks of battling the unprecedented COVID-19 pandemic. The potential personal and professional toll is substantial. This article describes how one healthcare facility benefited from existing peer support resources to address workforce well-being, ensuring that resources were available to support workforce resilience throughout the protracted COVID response.**

## Introduction

On January 4, 2020, the initial World Health Organization's announcement alerted the healthcare community to an outbreak of pneumonia in Wuhan, China.<sup>1</sup> Two weeks later, on January 19, a 35-year-old male became the first known coronavirus (COVID-19) positive patient in the United States.<sup>2</sup> Over the past months, with more than 85 million cases confirmed globally, and more than 20 million cases diagnosed in the United States, our lives have changed dramatically because of this worldwide pandemic.<sup>3</sup> When the first Missouri COVID-19 case was diagnosed on March 21, 2020, little did we realize the long-term implications on virtually every

aspect of our lives.<sup>4</sup> As we gain global insights into coronavirus care experiences from frontline clinicians, the importance of addressing the overall needs of the workforce, specifically emotional trauma, is becoming more apparent.<sup>5</sup>

The battle with COVID-19 has introduced unique occupational stressors for our clinicians and healthcare workforce. Providing such care threatens the individual clinician's physical, mental, and emotional well-being. The acute stress and uncertainty associated with the continual influx of critically ill patients, resource challenges, and ongoing risk of infection pose a unique dilemma to the healthcare team.<sup>6</sup> Hectic and extended work hours, combined with the countless uncertainties of the rapidly growing pandemic, contribute to workforce fatigue, anxiety, depression, and professional dissatisfaction.<sup>7</sup> The need to quickly modify care delivery practices in the face of a pandemic also introduces challenges.<sup>8</sup> Some of the occupational stressors are not new but have been amplified during the pandemic surges, while others have not been previously encountered. The pandemic has propelled us into a new healthcare environment and has forced us to make changes in how we do things each day. From an organizational



and leadership perspective, the COVID-19 crisis has highlighted the need for clinician support. This article describes how one healthcare system established a comprehensive clinician well-being tactic capitalizing on pre-existing peer support networks.

### Safeguarding the Clinicians

Each healthcare organization has a responsibility to protect not only their patients but their clinicians as well. The potential personal and professional toll on clinicians is substantial as providing pandemic care threatens physical, mental, spiritual, emotional, and financial well-being.<sup>6</sup> An evidence-based, proactive approach to address the emotional and mental well-being of clinicians is essential as healthcare settings navigate the pandemic. Supportive care for clinicians and the healthcare workforce must begin sooner rather than later and continue throughout the pandemic.

To address overall well-being, organizational leaders must understand and actively focus on the fears, concerns, and anxieties of their workforce. Leaders should be particularly vigilant for the harmful effects of repeated vicarious traumatization and the potential for associated anxiety, depression, grief, and burnout associated as clinicians work amid so many pandemic unknowns and a seemingly relentless uptick of patients. A proactive, holistic approach that supports emotional well-being should become a gold standard in the design of institutional responses as we progress forward.

### History of the University of Missouri Health Care's Peer Support Program

University of Missouri Health Care (MU Health Care) is a mid-western academic healthcare system with approximately 1,200 attendings, fellows, residents, and advanced practice providers. MU Health Care has a proven track record for safeguarding the emotional needs of their workforce through the execution of the 'first of its kind' peer support initiative, the forYOU Team.<sup>9</sup> Team members offer support to clinicians and other members of the health care team via confidential peer-to-peer interactions discussing the individual's responses to events and discussing their individual unique needs. The trained peer supporters recognize triggers of psychological trauma in their colleagues,

provide immediate emotional support, and, if necessary, offer informed referrals to professional counseling services for those co-workers requiring additional support. Program success can be attributed to team members who were carefully selected for their professional maturity, exemplary interpersonal skills, and communication abilities. These team members, representing a wide variety of professional roles and clinical settings, received training on the care of healthcare's second victims and individual crisis interventional support for colleagues needing assistance during the aftermath of challenging clinical events. For team member qualifications, refer to Table 1. During the first ten years of service, the forYOU Team peers have documented emotional support in the form of one-on-one support and group debriefings for more than 1,931 MU Health Care clinicians/team members.

During the past 13 years of advancing clinician support, the forYOU Team created a relatively unique organizational response to the provision of supportive presence for the healthcare team member in crisis.<sup>10</sup> Over time, the team has undergone an evolutionary transformation adapting to the ever-changing clinical environment and the various clinical scenarios facing the clinician. The peer network of supporters was initially designed in 2007 with a concentrated focus on the care of the clinician after an event involving a medical error. Team coordinators quickly realized that there were additional incidents that involved unanticipated clinical outcomes not associated with a medical error, and the scope of service expanded to address these clinical events. Within weeks after official team deployment, a request was made to support a manager with the unexpected death of a young co-worker. As one of the few MU Health Care resources trained specially in group crisis debriefing, the forYOU Team leaders convened the interdisciplinary team and assisted with the emotional processing of this unexpected event. The team soon became the 'go-to' resource for helping local leadership with the death of a co-worker. New tragic clinician events (workplace injury, catastrophic diagnosis of a co-worker, serious career-ending injuries) soon expanded the scope of responses. Approximately a decade later, the team's scope of service expanded once again



**Table 1. forYOU Team Member Qualifications**

1. Must be a member of the MU Health care team (Faculty, staff, student learners, and volunteers) with a minimum of two years of experience
2. Personal characteristics
  - Exhibit exemplary interpersonal communication skills
  - Ability to maintain confidentiality
  - Emotional maturity
  - Empathic
  - Non-judgmental
  - Culturally sensitive/aware
  - Natural confidante for team
3. Ability to work within established guidelines
4. Nomination endorsed by departmental leadership

**Table 2. MU Health Care's Well-Being Task Force**Co-Leaders

- forYOU Team Coordinators
- Office of Clinician Well-Being Leadership

Task Force Members

- Chief Wellness Officer
- Communications/Marketing
- Counseling & Clinical Psychologists
- Education Department Expert
- Health Psychologists
- Human Resources – Employee Relations & Engagement
- Nurse Scientist
- Nursing Leadership
- Psychiatrists
- Resident Physician – Wellness Expert
- Spiritual Care
- Staff Council Representatives

when an upsurge of requests was received to assist clinicians exposed to workplace violence. The team continues to expand its scope of service by offering assistance to colleagues and co-workers during the COVID response. With each evolutionary advance, team members received supplemental educational support, guidance, and the tools necessary to address the newest threat to clinician well-being. The natural outgrowth and evolution of support services over time have provided MU Health Care with a reliable platform for ensuring clinician support.

A foundational element of MU Health Care's forYOU Team is the commitment to maintaining a pool of trained clinicians throughout the healthcare system, available to offer supportive discussions with distressed colleagues in the aftermath of emotionally challenging clinical events. In our experience, only a small percentage of clinicians will reach out on their own behalf to receive emotional support. It is quite rare for the clinician leader of a healthcare team to seek mental health support following an emotionally challenging case. The forYOU Team

provides an organic approach to addressing the stigma of receiving support by capitalizing on the unique skillsets of qualified peers and by utilizing existing FTE. The team focuses on normalizing expectations, so when an emotionally challenging event occurs, a peer will be readily available to offer supportive and healing conversations proactively. Over time, the forYOU Team strengthened a culture of trust by supporting healthcare clinicians at their most vulnerable moments and by normalizing the fact that supportive presence should be an expectation and not an anomaly.<sup>11</sup>

### The Contribution of Peer Support to the Pandemic Response

The most recent expansion of services occurred when MU Health Care's COVID-19 response command center charged forYOU Team leadership with the task of developing strategies to support clinician well-being through the duration of the pandemic. The team formalized a comprehensive plan of action to address healthcare workforce well-being as part of MU Health Care's overall COVID-19 response initiative. The expansion of the scope of peer support services over the years positioned the skilled and dedicated peer supporters well to be able to address the collective trauma now associated with the COVID-19 challenges.

The forYOU Team leaders partnered with leadership from the MU School of Medicine's Office of Clinician Well-Being to formalize a plan of action, coordinating internal, campus, and community resources relating to the care of the healthcare workforce. A Workforce Well-Being Task Force, composed of key stakeholders and leaders, was established to ensure that the action plan would be holistic and address clinician needs throughout the protracted crisis response. Refer to Table 2 for Task Force Members. Members of the task force were selected based on expertise in aspects of well-being, representation of those providing front line care, and/or leadership roles needed to influence or deploy interventions. The task force established the following goals to support the health care workforce: attend to the basic care needs and safety of the workforce, facilitate connection with appropriate resources, create strategies for leaders at all levels to address clinician well-being, and enhance communication to correct misinformation and improve morale.

## Peer support is one of the most essential, evidence-based interventions healthcare institutions can implement.



The task force continues to meet virtually on a routine basis to assess the current status of the workforce and to identify unmet needs that have been detected by a member of the forYOU Team or Well-Being Task Force. Having forYOU Team supporters embedded in clinical environments throughout the healthcare system on every shift has proven valuable in promptly gaining insights regarding existing threats and concerns for the frontline. The peer supporters have become an essential conduit of information relating to new well-being resources. The forYOU Team peer supporters once again have risen to the challenge of supporting their co-workers.

A supportive and nurturing work culture is vital to maintaining the overall well-being and resilience of clinicians during the prolonged battle against COVID-19. As clinicians will be caring for patients through this pandemic, addressing clinicians' mental and emotional well-being is a smart institutional priority for any healthcare entity. Indeed, adapting supportive institutional resources to meet clinician needs during this healthcare crisis is a fundamental

intervention that every healthcare entity should seriously contemplate. Selected strategies should be evidence-based interventions that address a wide range of services and are tailored to various workplace settings to address the many needs of today's healthcare clinicians and workforce. While these strategies should be carefully considered, they should also be deployed in a timely manner.

Historically, health systems have offered numerous mental health resources (e.g., Employee Wellness Teams, Employee Assistance Program, Spiritual Care, etc.) to care for the everyday stress and emotional strain on clinicians. The need to expand these mental health support resources has become increasingly evident as healthcare organizations continue to fight against COVID-19 and have prompted many institutions to augment existing resources.<sup>12</sup> Tapping into existing internal and external resources, such as wellness committees, employee assistance programs, and spiritual care services, are potential resources to coordinate supportive interventions at the organizational level. To complement these



efforts, physician and professional organizations now provide a variety of ‘just in time’ resources for healthcare organization leaders to aid in supporting clinicians during the COVID-19 crisis.<sup>13-15</sup> These updated resources are invaluable in assisting leaders in navigating the redesign of clinician support during this unprecedented healthcare crisis and in the future.

MU Health Care was fortunate to have a track record of clinician well-being by investing the supportive infrastructure of both the forYOU Team and the Office of Clinician Well-Being. Because of these resources, MU Health Care was well-equipped, agile, and flexible to promptly develop a comprehensive and holistic interventional support plan to care for its clinicians and healthcare workforce. The knowledge and skills of forYOU Team peers have been incredibly useful in strengthening the institutional strategy of offering supportive presence to colleagues in distress. The establishment of peer support programs should become a common resource in addressing the unique and changing needs of healthcare workers during the pandemic and post-pandemic era.

## Conclusion

The health and economic crises brought about by the COVID-19 pandemic are not only dramatically changing the lives of the public but substantially impacting the overall healthcare system and the delivery of care. When the crisis begins to resolve, and we move towards our ‘new normal,’ healthcare institutions must continue to strengthen the overall well-being of their clinicians and workforce by deploying comprehensive approaches to support both personal and professional resilience. Before COVID-19, clinician burnout and poor mental health indicators were already a well-documented national pandemic; this crisis might be exacerbated in the wake of COVID-19.<sup>16-20</sup> Peer support is one of the most essential, evidence-based interventions healthcare institutions can implement. This article shared experiences and insights so that leaders, peer supporters, and healthcare workers can recognize, explore, and ‘normalize’ supportive interventional responses within their organizations. Working together, caring for each other, we can thrive and not merely cope with and survive the pandemic challenges that lie ahead.

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## Disclosure

None reported.

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# Creating Space for Well-Being in Medical School and Beyond

by Stephanie Bagby-Stone, MD



**When medical students trust you enough to open up, you can listen without passing judgment and be willing to help remove the barriers. We must learn from our students to be able to teach them.**



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## Abstract

**The harmful effects of medical education on student well-being are concerning with ever more frequent outcomes of burnout, depression, and even suicide. Medical schools are working to better understand factors that adversely affect student well-being, and to implement interventions, develop strategies for prevention, raise awareness, decrease stigma, encourage treatment, and promote lifelong resilience and wellness. In Missouri, statewide meetings among medical and osteopathic schools and legislative actions are aiding in these efforts.**

**I am a psychiatrist, an educator, and a mentor, but my most important role is that of a medical student well-being advocate. Over the past 20 years, I have experienced great joy and satisfaction working with medical students while in these roles at the University of Missouri. I remain inspired by these future physicians and the stories of what they have experienced to get to where they are and who they want to become as a physician. Their compassion and their passion to serve are profound. Our students are often quite resilient and have grit. And yet, despite their strengths, intelligence, and resilience, many suffer and become at risk.**

## Medical Student Mental Health

The statistics on the adverse effects of medical education on student mental health demonstrate disturbing trends. Doctors in training are vulnerable to burnout, depression, suicide, and substance use.

But it doesn't start out that way. In the U.S., medical students start off their medical learning with significantly less depression, less burnout and better quality of life than their college-educated peers; however, during the process and environment of their four years of medical education, their reported well-being decreases.<sup>1</sup> A recent systematic review revealed 27.2% of medical students experience depression or depressive symptoms and 11.1% have suicidal ideation.<sup>2</sup> Burnout is even more common, with nearly 50% of medical students experiencing this syndrome of exhaustion, cynicism, and inefficacy.<sup>3</sup> Rates of depression, suicidal ideation, and burnout are also elevated in residency and fellowship years, continuing on into early career. Burnout is more frequent than among their non-medical peers at each step in their professional development.<sup>4</sup>

Substance abuse among medical students is another issue of concern. While much is known about the concerning substance abuse patterns among physicians,



more information is needed about the current status of substance abuse in medical students since most of the studies were performed over twenty years ago.<sup>5</sup> The available data suggests that substance use continues among U.S. medical students and that this use can be accompanied by interpersonal, academic, physical, cognitive, and emotional consequences.<sup>6</sup> Alcohol use is especially common, with up to 90% reporting use and 34-58% of medical students reporting binge drinking.<sup>6,7</sup> Regarding illicit substances, marijuana is reported to be the most common, with as many as one in three medical students having used cannabis.<sup>8</sup>

### Personality, Perfectionism, and Impostor Syndrome

In my work with medical students, I find certain themes arise repeatedly in our conversations. Self-doubt, excessive comparison, perfectionism, and lack of confidence are among the most common.

Since the late 1970s, it has been recognized that some high achievers experience “impostor syndrome.” It is often experienced as enduring feelings of self-doubt and insecurity, as well as feeling less intelligent or incompetent. Those with impostor syndrome find it very difficult to feel a sense of success, expertise, or skill. They attribute their achievements to luck, charm, or another person’s mistake. They fear being found out as a fraud, fake, or sham. Racial or ethnic minority students and women of color may be particularly vulnerable to impostor feelings.<sup>9,10,11</sup> These feelings are common among medical students, evidenced by a recent study finding that impostor syndrome affects nearly 50% of female and 25% of male medical students.<sup>12</sup> It can occur at all stages of a medical career and often worsens during transitions, of which medical school has many. Not surprisingly, impostor syndrome is associated with perfectionism and can have detrimental effects on mental well-being by generating feelings of depression, anxiety, fear, and burnout.<sup>11</sup>

We know that perfectionism is very common among high achieving individuals, including medical students, residents and practicing physicians.<sup>13</sup> Perfectionism can be a great strength for a physician prompting them to be detailed and responsible. These high standards help them achieve medical school admission and contribute to their success during their education. The difficulty comes when perfectionists set unrealistic expectations, strive to be flawless, and their high standards become overly critical. With inherent risks and uncertainties, the practice of medicine is not

a perfect science. This dynamic creates vulnerability, doubt and dissonance in the overly perfectionistic young physician.

Other personality characteristics, including obsessionality and compulsiveness, may affect a medical student’s ability to set limits and their expectations of themselves and others. A “compulsive triad” of “doubt, guilt feelings, and an exaggerated sense of responsibility” have also been suggested as core personality features which are often prevalent among many physicians.<sup>14</sup> As you can imagine, much like perfectionism, these traits may have both helpful and harmful consequences, and can profoundly affect their confidence, performance, and self-care, as well as their sense of success or shame.

### The Cost of Medical Student Stress

Medical school and the residency Match process, which feel like high stakes, low control situations for students, exacerbate worries about high educational debt and their overall future professional and personal life. The demanding academic and clinical workload, curriculum, evaluation, and culture alone can trigger significant medical school distress.<sup>15</sup> Students are exposed to clinical experiences and to death, suffering, and pain, perhaps for the first time. They may be working with residents or attendings who are unhappy and experiencing burnout. Students may experience ethical or value conflicts in educational or clinical settings. Expected or unexpected life events occurring in their personal lives during medical school can also influence student distress.<sup>15</sup>

Student motivation, learning style, and reservoir of coping skills can also contribute to their stress level.<sup>15</sup> The time and energy demands and academic rigor of medical school, combined with the competitiveness of the Match, make it difficult for students to prioritize self-care and cultivate healthy coping mechanisms even when they have the skills.

Another concerning issue is mistreatment. Mistreatment of medical students by faculty, peers, or clinical staff remains common with more than one-third of students reporting at least one episode by the end of their medical school training.<sup>16</sup> In addition to those who report, there are students who will never report mistreatment due to fear of retaliation. Student mistreatment comprises a range of negative behaviors including discrimination, humiliation, verbal abuse or threats, assault, and sexual harassment. These episodes can significantly influence student well-being,



contribute to burnout and create negative mental health consequences. When compared to other groups, women, racial and ethnic minorities, and sexual minorities reported more occurrences of mistreatment during medical school based on review of recent AAMC-GQ data.<sup>16</sup>

Not surprisingly, the effects of these stressors on medical students can have serious professional and personal consequences, which may include worsening academic performance, academic dishonesty, attrition, impaired competency, medical errors, reduction in quality of patient care and safety, relationship problems, poor self-care, cynicism, loss of empathy, burnout, substance abuse, worsening physical health, worsening mental health, and suicide.<sup>15,17</sup> The costs are very high indeed.

Sadly, far too many students suffer in silence thinking they are the only ones experiencing these issues. They fear exposing their vulnerabilities and weaknesses. Many medical students do not seek help or delay seeking help for mental health concerns due to stigma and worries about how it will affect their academic and professional career, credentialing, or licensing.

### Seeking Solutions

Medical student mental health, suicide, burnout awareness and prevention, as well as resilience and wellness are increasingly topics of concern and interest among medical schools. Exploring ways to bring resources to students to assess and alleviate these issues are a priority among schools.<sup>18</sup>

The accrediting bodies for medical and osteopathic schools have revised standards to include elements about student well-being. The Liaison Committee on Medical Education (LCME) has acknowledged the importance of improving medical student well-being and requires medical schools to have programs that “promote student well-being and facilitate adjustment to the physical and emotional demands of medical education.”<sup>19</sup> The Commission on Osteopathic College Accreditation (COCA) also revised standards to include heightened student health and wellness resources, including focusing on the clinical learning environment. These increased core requirements included confidential access to an effective system of counseling and mental healthcare.<sup>20</sup>

Medical school initiatives to improve student well-being include reducing unnecessary stressors in medical schools, making curricular changes, improving

mentoring, teaching stress management skills, providing mental health education, improving access to resources and treatment, reducing stigma, providing wellness programming and creating opportunities for students to find meaning and purpose at each step of the medical school journey.<sup>21,22,23</sup>

A systematic review found some evidence that pass/fail grading systems, elements of curriculum structure (including increased clinical time, decreased time on exams, prematriculation programs, and problem-based learning), multicomponent program reform, mental health programs, wellness programs, mind-body skills programs, advising programs, and mentoring programs were associated with improvements in medical student well-being, but concluded more high-quality research is needed to develop best practices.<sup>24</sup> Other strategies utilized in medical schools include designating an individual to oversee student well-being, creating student well-being committees, and fostering the presence of learning communities.<sup>25</sup>

### How Missouri is Uniquely Addressing the Issue

Missouri has been working to improve medical student well-being for many years. The medical and osteopathic schools in the state of Missouri have been gathering regularly to discuss student mental health and wellness since 2015.<sup>18</sup> Due to the increasing importance of these topics, these calls and meetings have become more frequent over time. The collaboration and sharing of ideas, experiences, and resources promotes student well-being for all of the medical students in the state. Topics discussed include student mental health and substance use, campus resources, curricular design, wellness programs, mindfulness, resilience, stigma, and most recently the effects of COVID-19 on the students’ educational experience and well-being and how to better support them through these uncertain times.

In 2017, Missouri became the first state in the nation to take legislative action to raise awareness of the mental health risks of depression and suicide faced by students in medical school. Missouri Senate Bill 52 designated “Show-Me Compassionate Medical Education Day” to be observed on the third Monday in September.<sup>26</sup> This bill also promotes research on depression, suicide and other mental health concerns among our medical students to find possible strategies to improve their well-being and to save lives.

Student well-being is very important to the University of Missouri School of Medicine. Wellness activities and programs have been expanding over recent years and continue to grow. Over five years ago, my position was created to work closely with the Associate Dean for Student Programs, to provide support for our medical students, and to create wellness programming.

Here's a snapshot of some of the elements of our programs: Early in medical school, all of our first-year students are required to participate in a wellness orientation which strives to decrease stigma and increase awareness of the importance of early intervention. All of our students are asked to complete a mandatory online suicide prevention training. Every first- and second-year medical student attends a one-on-one wellness check-in to discuss how they are functioning in medical school, answer questions, and provide information about available resources. Our students have access to primary care, psychiatry, and therapy services on campus, and as well as wellness services such as yoga and mindfulness training. They also have access to MizzouRec, a state-of-the-art fitness center, which is a short walk from the medical school.

We highly value student input to help evolve our wellness programs and activities. Two elected students from each class serve as Wellness Representatives. In this role, they actively participate in committees, provide insights into the issues and concerns of medical school life, and generate ideas for our presentations and activities. Students can attend health and wellness talks on topics that have included fitness, nutrition, coping with academic stress and exams, stress management, positive psychology, and mindfulness. We have also provided health and wellness newsletters, volunteering opportunities, food fairs, cooking demonstrations, yoga, and various sport/fitness related activities. We recently created a house system to help students build



Effects of stressors on medical students can have serious professional and personal consequences, which may include worsening academic performance, academic dishonesty, attrition, impaired competency, medical errors, reduction in quality of patient care and safety, relationship problems, poor self-care, cynicism, loss of empathy, burnout, substance abuse, worsening physical health, worsening mental health, and suicide.

relationships with each other and with faculty and are in the process of expanding our peer support program.

Curricular wellness, academic accommodations and mistreatment reporting are also important components of our student well-being program. MU has a longstanding Patient-Based Learning curriculum with pass/fail grading in the first year. Well-being topics are a component of our required curriculum in *Contemplating Medicine, Patients, Self, and Society (COMPASS)*, a longitudinal course in which faculty members facilitate discussions on topics related to professionalism with small groups of students from all four classes. For ongoing support, students are matched with academic advisors at all stages of their medical school career.

### Creating Space

I am a doctor, an educator, a mentor, a human being, and a recovering perfectionist. As physicians, we must never lose touch with our humanity and our vulnerability as this is how we feel empathy and generate the energy for compassion to move us to serve others. We must use this compassion to help our own students and to recognize and respond to their vulnerabilities. This compassion also needs to extend to our colleagues in residency and in practice.

We must model and help learners to know that a physician must be physically, mentally, and spiritually

healthy in order to heal. We must teach them self-care skills and how to make purpose and value driven career decisions. We must encourage them to understand that investing time and energy in well-being is the key to success, professionally, and personally.

In my experience, medical students are most likely to listen to the experiences of trusted medical students, residents, and physicians. To be effective mentors, we need to be real and vulnerable ourselves and talk about our struggles, our failures, our successes, and how we have coped.

Do not be quick to judge younger generations of student doctors as lacking resilience. I have never met a medical student who did not possess significant strengths and some coping skills. It is almost impossible to achieve medical school admission without these abilities. The question to ask is, “What is preventing you from using these skills?” And when they trust you enough to open up, listen without passing judgment, and be willing to help remove the barriers. We must learn from our students to be able to teach them.

Teaching coping skills and building resilience is a very small part of the solution. We need to be vigilant in refining our content and process for teaching future doctors. We must continually strive to eliminate the unnecessary stresses that accompany medical training and to improve the medical culture and environments that physicians will be working in now and in future. There is already more than enough stress learning to become a doctor and in practicing medicine. Creating space in these ways will allow for medical students and physicians to thrive and care for themselves and others.

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## Disclosure

None reported.

MM



# Are We Coping Well with COVID-19?

## A Study on Its Psycho-Social Impact on Front-line Healthcare Workers

by Tinashe Maduke, MD, James Dorroh, BA, Ambarish Bhat, MD, Armin Kravac, MD & Hariharan Regunath, MD



**A significant proportion of healthcare workers across multiple disciplines as well as training physicians perceived increased anxiety, fear of dying, and disruptions in their workflow from the COVID-19 pandemic.**



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### Abstract

#### Background

Global pandemics have a profound psycho-social impact on health systems and their impact on healthcare workers is under-reported.

#### Methods

We performed a cross-sectional survey with 13 Likert-scale responses and some additional polar questions pertaining to dressing habits and learning in a university hospital in the midwest United States. Descriptive and analytical statistics were performed.

#### Results

The 370 respondents (66.1% response rate, age  $38.5 \pm 11.6$  years; 64.9% female), included 102 supervising providers [96 (25.9%) physicians, 6 (1.6%) mid-level], 64 (17.3%) residents/fellows, 73 (19.7% nurses, 45 (12.2%) respiratory therapists, 31 (8.4%) therapy services and others: 12 (3.2%) case-managers, 4 (1.1%) dietitians, 39 (10.5%) unclassified]. Overall, 200 (54.1%) had increased anxiety, 115 (31.1%) felt overwhelmed, 159 (42.9%) had fear of death, and 281 (75.9%) changed dressing habits. Females were more anxious (70.7% vs. 56%,  $X^2(1, N=292)=5.953, p=0.015$ ), overwhelmed (45.6% vs. 27.3%,  $X^2(1, N=273)=8.67,$

$p=0.003$ ) and suffered sleep disturbances (52% vs. 39%,  $X^2(1, N=312)=4.91, p=0.027$ ). Administration was supportive; 243 (84.1%,  $N=289$ ), 276 (74.5%) knew another co-worker with COVID-19, and only 93 (25.1%) felt healthcare employment was less favorable. Residents and fellows reported a negative impact on their training despite feeling supported by their program.

#### Conclusion

Despite belief of a supportive administration, over half of healthcare workers and learners reported increased anxiety, and nearly a third felt overwhelmed during this current pandemic.

#### Introduction

Pandemics are large scale outbreaks of infectious diseases that occur typically across continents, resulting in significant morbidity and mortality. The coronavirus disease of 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has caused more than 13 million cases and 272,000 deaths in the United States (U.S.) to date.<sup>1</sup> The health sector is not exempt to financial losses, moreover, it is particularly vulnerable to suffer more financial burden from increasing (at times overwhelming) number of cases. The American Heart Association estimated that



between March 1 and June 30, 2020, hospitals and health systems suffered \$202.6 billion in losses.<sup>2</sup> This is further compounded by national shortages of personal protective equipment (PPE), thus directly impacting frontline healthcare workers who fight to serve patients on a daily basis. Prior viral pandemics such as severe acute respiratory syndrome (SARS), and Middle Eastern Respiratory Syndrome (MERS) have caused psychological distress among healthcare workers.<sup>3-7</sup> While vigilance exists for vital financial aspects of the health care system during such pandemics, the direct and indirect psychosocial impact of such pandemics on the workflow and workplace of a health care worker is often not prioritized as a concern and is seldom addressed. There are several reports and studies on the effects of the COVID-19 pandemic on healthcare workers elsewhere but there is paucity of such studies in the United States, except for one study among nurses in Michigan.<sup>8-24</sup> Hence, we performed a study to evaluate the impact of the COVID-19 pandemic on our university hospital's healthcare workers and training programs (residencies and fellowships).

### Methods

We performed an anonymous survey of healthcare providers at our university hospital between April 15 and May 10, 2020, after approval from our institutional review board. At the time of the survey, the daily number of hospitalized COVID-19 cases were lower, i.e.  $\leq 20$  cases (intensive care unit cases  $<8$  per day) in our institution, the hospital had resumed elective surgical procedures, and continued to have a restricted visitor policy. The survey contained 13 Likert scale (5 point) questions aimed to assess the psychosocial impact of the COVID-19 pandemic on their work environment and two questions with yes/no responses for dressing habits and their knowledge of a sick co-worker. There were two additional questions on the impact of the pandemic on medical education of residents and fellows. Pulmonary, critical care, and infectious disease faculty reviewed the survey questionnaire (Supplement 1) for face validity. We followed the EQUATOR network's reporting guidelines for the design and conduct of

Supplement 1. COVID 19 Psycho-social Impact Survey Questionnaire responses from residents, fellows, attendings, nurses and respiratory therapists.

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
COVID-19 pandemic has significantly impacted my daily workflow	1	2	3	4	5
COVID-19 pandemic has offered me an opportunity to observe emergency preparedness in our hospital	1	2	3	4	5
Learning opportunities have decreased because of the COVID-19 pandemic	1	2	3	4	5
Hospital Administration is supportive at work at this time	1	2	3	4	5
Residency and Fellowship programs is supportive at this time	1	2	3	4	5
My co-workers are considerate and supportive at work at this time	1	2	3	4	5
My family and friends are considerate and supportive at this time	1	2	3	4	5
I feel overwhelmed at work due to the COVID-19 pandemic	1	2	3	4	5
Employment in healthcare has become less favorable for me because of the COVID-19 pandemic	1	2	3	4	5
My sleep is affected by the COVID-19 pandemic	1	2	3	4	5
I am more anxious at work because of the COVID-19 pandemic	1	2	3	4	5
My anxiety is related to the panic among the public than my work environment	1	2	3	4	5
I would prefer to take time off work at this time	1	2	3	4	5
I would want more information about the pandemic from the hospital leadership	1	2	3	4	5
I am worried about contracting COVID-19	1	2	3	4	5

	Yes	No
Did you change your dressing habits when coming or leaving work due to the COVID-19?		
Do you know of any fellow worker who has contracted the COVID-19?		

Table 1. Responses on feeling supported from the hospital administration by occupation status

Occupation	Hospital Administration Was Supportive (N= 289)	
	Agree N = 243 (84.1 %)	Disagree N = 46 (15.9 %)
Nurse	47 (83.9%)	9 (16.1%)
Resident	38 (90.5)	4 (9.5)
Fellow	2 (33.3)	4 (66.7)
Attending Physician	64 (84.2)	12 (15.8)
Respiratory Therapist	30 (85.7)	5 (14.3)
NP/PA	5 (100)	0
Social Worker	6 (54.5)	5 (45.5)
Dietitian	3 (100)	0
Physical Therapy	8 (100)	0
Occupational Therapy	10 (83.3)	2 (16.7)

surveys.<sup>25,26</sup> In order to understand the psychosocial impact of this pandemic across all strata of frontline health care workers in a hospital system, our target population included attending physicians, fellows, residents, nurse practitioners, nurses, therapy services (physical and occupational therapists), respiratory therapists, and social workers, etc., across all medical and surgical subspecialties.

Institutional group email accounts for each specific group were emailed a link to an electronic survey designed using research electronic data capture (REDCap) tools hosted at the University of Missouri. We stated that participation is completely voluntary and that no incentive will be provided.<sup>27,28</sup> REDCap is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

Additional paper surveys were used for a minority of respondents in the medical intensive care units (ICU) per their preference. Demographic data are represented as numbers and percentages, non-parametric continuous variables were analyzed with Mann Whitney U test and categorical variables were analyzed with Chi-square tests. For comparative analysis we excluded “neutral” responses and combined ‘strongly agree’ and ‘agree’ responses as one group and similarly, grouped ‘strongly disagree’ and ‘disagree’ responses together.

Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 26 (© Copyright IBM Corporation).

## Results

Of the 560 email recipients, 370 completed the survey [66.1% response rate, age  $38.5 \pm 11.6$  years, male 117 (31.6%), female 240 (64.9%), unspecified gender 13 (3.5%)]. Daily workflow was significantly impacted for all strata of health

care workers as shown in Figure 1. Overall responses to the Likert-scale questions are displayed in Figure 2. Most respondents (200, 54%) strongly agreed or agreed that they had increased anxiety as a result of the pandemic. Only 115 (31.1%) felt overwhelmed. Women felt more overwhelmed (45.6% vs. 27.3%,  $X^2(1, N=273)=8.67$ ,  $p=0.003$ ), had more work place related anxiety (70.7% vs. 56%,  $X^2(1, N=292)=5.953$ ,  $p=0.015$ ) and suffered more sleep disruption (52% vs. 39%,  $X^2(1, N=312)=4.91$ ,  $p=.027$ ) than men. Dressing patterns when coming in and out of work were changed by 281 (75.9%), of which 183 (65.1%) were female.

Among the respondents, 159 (42.9%) were worried about dying from COVID-19, working in healthcare was less favorable for 94 (25.4%) respondents, and 274 (74%) respondents knew of another hospital worker who had contracted COVID-19. Hospital administration was considered to be supportive by 243 respondents (84.1%) irrespective of occupation status (Table 1). Those who knew of a sick coworker did not consider working in healthcare as less favorable because of this knowledge, when compared to those who did not (48% vs. 37%,  $X^2(1, N=233)=2.02$ ,  $p=0.155$ ).

Among the residents and fellows, 36 (56.2%) stated that the pandemic had negatively impacted their learning opportunities. With regards to support from residency and fellowship programs, and 34 (53.1%) of residents and fellows (excluding neutral responses) felt that they were sufficiently supported by their program.

## Discussion

This is one of the first studies in an academic setting in the U.S. to investigate the psychosocial

Figure 1. Perception on the Impact of COVID-19 on a Daily Workflow

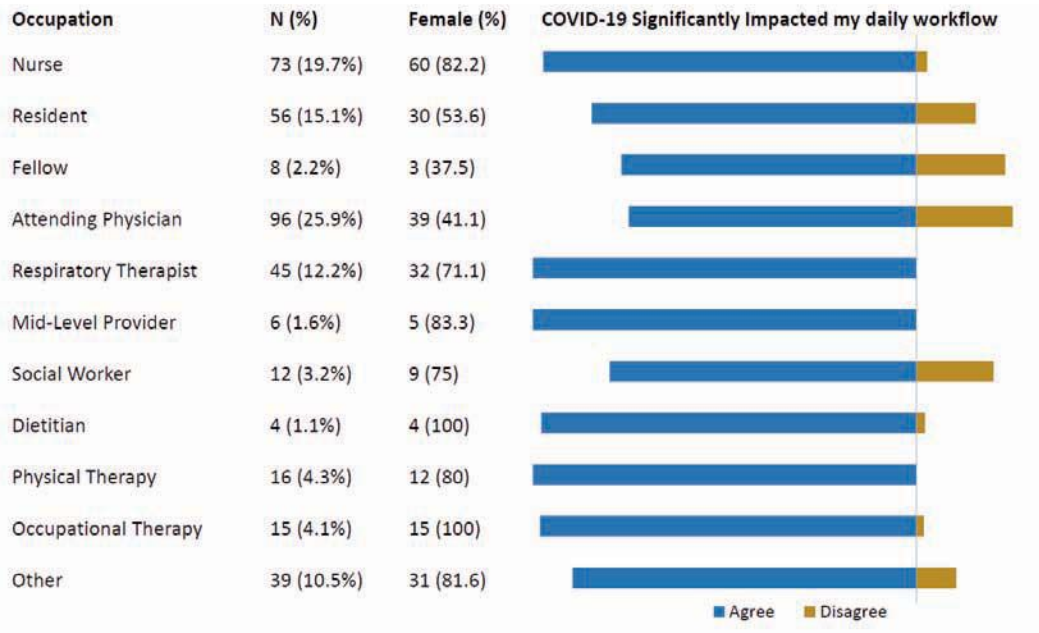
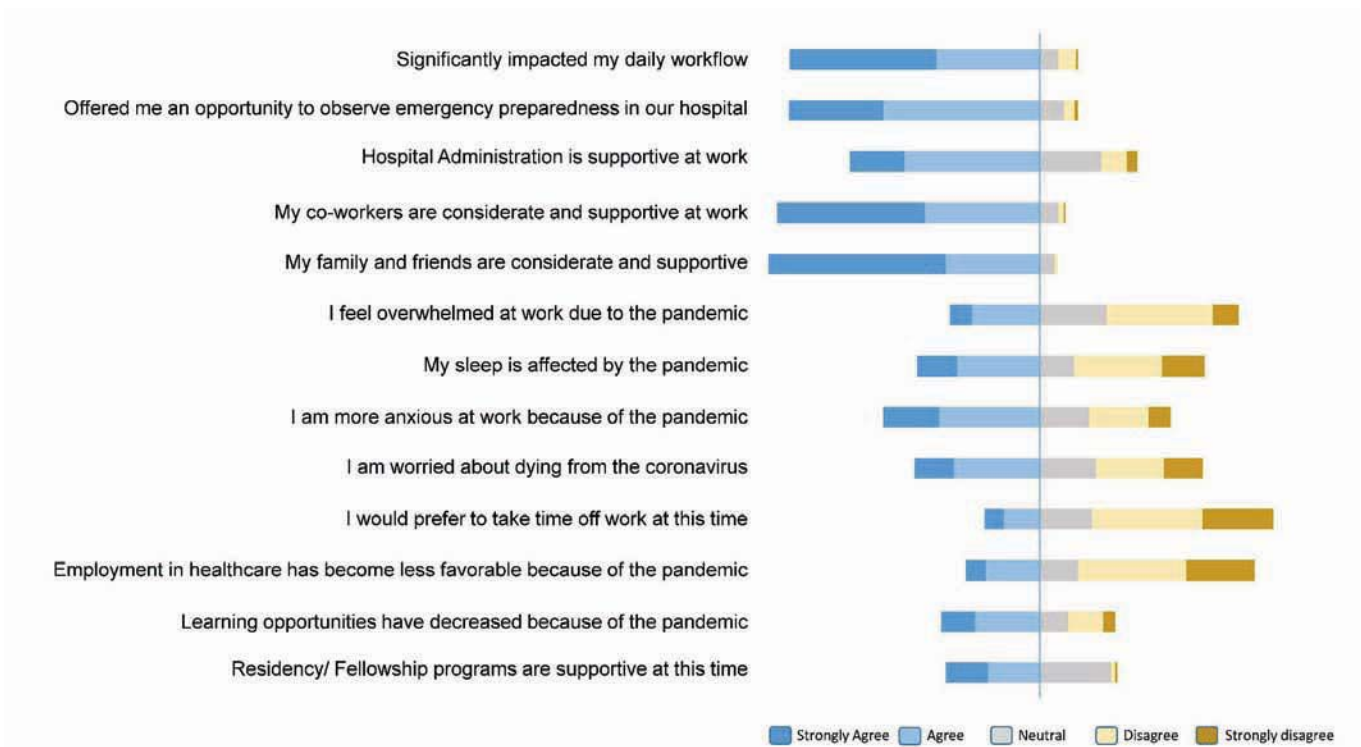


Figure 2. Responses to the 13 Likert-Scale Questions





impacts of the COVID-19 pandemic on multiple disciplines of frontline healthcare workers in the U.S. It clearly reveals significant psychosocial strain among most healthcare workers. It highlights certain areas that could be targets for mitigation efforts. At least a third of respondents were overwhelmed, anxious, and worried about dying, but despite these negative feelings, a majority felt that the hospital management was supportive. A prior study in 2016 by Khalid et al. that evaluated impacts of the MERS-CoV epidemic showed that personal safety and well-being of colleagues were significant concerns that were mitigated by support from hospital management for infected colleagues.<sup>4</sup> In our study about a quarter of the respondents felt that working in healthcare was no longer favorable. This is higher than reported in prior investigation in SARS outbreak.<sup>7</sup> Significant work-related stress during a global pandemic is inevitable among frontline healthcare workers, fueled by increased work demands, safety concerns, limited resources, and even media frenzy. In a recent systematic review, there was a paucity of studies on interventions to support mental well-being of health care workers.<sup>29</sup> Table 2 provides a summary of methods, sample characteristics, results, and limitations of other studies published in peer-reviewed journals that assessed stress and other psycho-social well-being of health care workers during the current COVID-19 pandemic.

In another study assessing the impact of SARS on academic physicians in three hospitals, Grace et al. found that 9.3% of respondents were reevaluating their career choice.<sup>7</sup> Though it is difficult to draw conclusions from one study, in recent years, increasing burnout among healthcare professionals remains a significant concern.<sup>30</sup> Thus, it is crucial to have support systems that prevent further burnout among healthcare workers. Furthermore, in rapidly spreading communicable disease pandemics such as COVID-19, health care workers are at particularly high-risk for contracting the disease, resulting in a shortage of healthcare workers and adding further constraints to health care systems. Hence, addressing these concerns is of paramount importance.

The majority of residents and fellows reported disruptions in their learning opportunities. Most of

the disruptions were likely related to changes in the workflow within the hospital as well as suspension of rotations and decrease in patient volumes and diversity of clinical cases due to containment measures. Other possible considerations include being unable to attend teaching conferences in their usual venues, changes in rounding structure, and inability to go to national or regional conferences. This has also been reported in training programs across the globe in this COVID-19 pandemic.<sup>31-34</sup> This fuels the need to find innovative ways to help training programs to continue the mandate to train the next generation of healthcare workers.

While other survey studies have evaluated the impact of COVID-19 on specific sub-specialties, this was the first study that surveyed a broad range of healthcare professionals representing most of the essential disciplines of health care workers involved in academic U.S. hospitals.<sup>35-37</sup> We limited the number of questions to fit their busy work-schedule during COVID-19 pandemic, yet have gathered information on multiple aspects of healthcare worker's welfare and thus considered fairly representative of key areas highlighted in prior studies.

This was a single academic center study and may not be applicable to other academic or non-academic medical centers. Other limitations include lack of an externally validated survey instrument, and insufficient numbers in certain sub-groups of healthcare professionals to make robust comparisons. Last but not least, the volume of COVID-19 patients at the time of the survey in our rural mid-west U.S. was smaller compared to the then hard-hit areas such as New York City and Seattle, Washington.

## Conclusions

A significant proportion of healthcare workers across multiple disciplines as well as training physicians perceived increased anxiety, fear of dying, and disruptions in their workflow from the COVID-19 pandemic. Additionally, it has had an adverse impact on medical training/education. These findings emphasize the importance of being prepared to support frontline workers and trainees at times of widespread crisis. Health care provider well-being should be an essential component of pandemic planning.

**Table 2:** Summary of recent studies assessing health care worker’s psycho-social stress during the COVID-19 pandemic.

Study authors, Country	Methods	Sample Characteristics	Key Results	Limitations
Zhang Y, et al., Sudan <sup>8</sup>	Quarterly assessment using PSS-10, GAD-7 and PHQ-9.	47 HCWs in a UN Level II peacekeeping field hospital, including physicians, nurses, technicians/pharmacists. 70.2% male; mean age 38.3 years. Out-patient, inpatient, emergency, and lab/radiology/pharmacy settings.	Elevated mental stress noted among all HCWs after the outbreak. The threat of COVID-19 infection, delays in annual rotation of medical staff among UN hospitals and family-related concerns were the main stressors.	Small sample size, single hospital, unique resource limited circumstances of UN field hospital.
Magnavita N, et al., Italy <sup>9</sup>	ERI questionnaire, organizational justice with the Colquitt Scale, insomnia with SCI, and mental health with GADS.	90 anesthesiologists directly caring for COVID-19 pts. 58.1% participation rate; 52.2% female; 76.7% were < age 35 years. Most without a partner or children or dependent relatives. 23.3% lacked social support, 23.3% reported unprotected exposure to COVID-19.	71.1% had increased stress, 36.7% reported insomnia, 27.8% had anxiety and 51.1% had depression. Efforts towards work significantly correlated with depressive symptoms (r = 0.396).	Small sample size, single hospital setting. Only surveyed anesthesiologist.
Arnetz JE, et al., U.S.A <sup>10</sup>	An 85-item research questionnaire assessed demographics, work-factors, patient contact experiences, emergency preparedness, PPE, fear, and mental wellbeing.	695 nurses in Michigan, 94.3% female. 69.0% > 10 years of experience. 52.7% inpatient/hospital setting. 82.4% had contact with COVID-19 patients at least once, 22% were in contact daily.	Stress was related to: workplace in 51.21% e.g., co-worker relationships, perceived administrative failings related to supplies and training, fear of infection in 29.67%, COVID-19 illness/death of patients/coworkers/loved ones in 38.90%, from limited PPE supplies, unclear guidelines, and physical discomfort in 21.98%, and the unknowns (scientific/social) in 22.64%.	Low response rate (685 of ~18,300 eligible), single U.S. state.
Soto-Rubio A, et al. Spain <sup>11</sup>	Cross-sectional questionnaires on a convenience sample of nurses. TMMS-24 for emotional intelligence; UNIPSCO Battery for psychosocial risks; FEWS for emotional work; CESQT for burnout syndrome.	125 Spanish nurses completed survey; 80% response rate. 79.1% female. 43% temporary workers, 57% permanent workers.	Emotional intelligence protected against burnout, psychosomatic complaints, and a preserved job satisfaction, but it could be a risk factor for certain psychosocial risks, such as interpersonal conflicts or lack of organizational justice.	Small sample size. Difficult to establish causal relationships of variables. Limited to one city in Spain. Nurses only.
Haravuori H, et. Al. Finland <sup>12</sup>	Initial results of prospective cohort study. Assessed demographics, MHI-5, ISI, PHQ-2, PC-PTSD-5, and OASIS symptom rating scales, work experiences, changes in daily work, attitudes toward COVID-19 patients, and the need for psychosocial support.	4804 Helsinki University Hospital HCWs completed survey (19% response rate). 62.4% were nurses, 8.9% were physicians, 7.9% special personnel (including psychologists, social workers), 20.9% other (non-healthcare) personnel. 87.5% female.	43.4% reported traumatic COVID-19 pandemic-related events, 83.3% had no distress per MHI-5. 82.4% experienced changes at work; 16.3% felt the need for psychosocial support. 43% reported insomnia. 32.2% reported depression. 19.9% had anxiety due to fear of COVID-19 at workplace.	Low response rate. Single center study.
Milgrom Y, et al., Israel <sup>13</sup>	Electronic questionnaire survey of hospital workers assessing demographics, attitudes about COVID-19, and present anxiety state (STAI-S).	1570 HCWs (24% response rate). (Dentists, physicians, nurses, research staff, office staff, lab workers, social workers, psychologists, etc.) 71.7% female.	33.5% had anxiety. Being a resident physician/nurse/female and having COVID-19 risk factors were associated with clinical anxiety, but not workplace. The most stress was from a fear of infecting their families.	Low response rate may overestimate anxiety. Single health system.
Delgado-Gallegos JL, et al. Mexico <sup>14</sup>	Electronic questionnaire survey: 36-item COVID-19 stress scales (CSS) adapted for Spanish speakers; assesses stress and anxiety symptoms in daily life.	104 HCWs in NE Mexico, various cities/towns. Physicians, medical students, nurses, and others working in a variety of health care settings (emergency, intensive care, obstetrics, primary care, pediatrics, etc). 57% male.	Normal levels of stress have increased during the COVID-19 pandemic. Fear of being an asymptomatic carrier is a concern.	Small sample size of HCW from many different work areas and specialties.
Sorokin MY, et al. Russia <sup>15</sup>	Online survey consisting of two phases (3/30/20 - 4/5/20 and 5/4/20 - 5/10/20) using PSM-25	1800 HCWs from across all Russian federal districts and federal cities. 81.1% female. Physicians, nurses, & paramedics were surveyed. Numerous specialties represented.	Physicians were more stressed than nurses and paramedics. Direct contact with COVID-19 infection is associated w/significant increase in stress among medical personnel.	Most were psychiatrists. Region of residence and current level of epidemic process not considered.

Abbreviations: COVID-19 - Coronavirus disease 2019, CES-D – Center for Epidemiological Studies Depression, DASS-21 – Depression, Anxiety and Stress Scale - 21 items, ERI – Effort Reward Imbalance, FEWS – Frankfurt Emotion Work Scale, GAD – Generalized Anxiety Disorder, GADS- Goldberg Anxiety Depression scale, HCW – Health Care Worker, IES (-R) – Impact of Event Scale (-revised), ISI – Insomnia severity Index, MHI – Mental Health Inventory, OASIS – Outcome and Assessment Information Set, PHQ – Patient Health Questionnaire, PPE – Personal Protective Equipment, PSM-25 – Psychological Stress Measure (25 item scale), PSS-10 – Perceived Stress Scale – 10 item, PTSD – Post-traumatic stress disorder, PC-PTSD-5 – Primary Care PTSD screen for DSM 5, SAS - Self-rating Anxiety Scale (SAS), SCI – Sleep Condition Indicator, SDS – Self Rating Depression Scale, STAI-S – State Trait Anxiety Inventory Scale, TMMS – Trait Meta Mood Scale, UN – United Nations, UNIPSCO - Unidad de Investigación Psicossocial de La Conducta Organizacional, CESQT - Cuestionario para la evaluación del síndrome de quemarse por el trabajo,



**Table 2 (Contd.):** Summary of recent studies assessing health care worker’s psycho-social stress during the COVID-19 pandemic.

Study authors, Country	Methods	Sample Characteristics	Key Results	Limitations
Awano N, et al. Tokyo, Japan <sup>16</sup>	Survey on anxiety, depression, resilience, fear of infection/death; isolation/unreasonable treatment; motivation/escape behavior at work were assessed using GAD-7, CES-D, and 10-item Connor-Davidson Resilience Scale.	848 HCWs at the Japanese Red Cross Medical Center completed survey (43.2% response rate). 12.3% physicians, 54.4% nurses, 21.7% other medical staff, 11.7% office workers. 74.9% female.	10% developed moderate-to-severe anxiety d/o; 27.9% developed depression. Being a nurse and high total GAD-7 scores were risk factors for depression. Older workers and those w/higher resilience were less likely to develop depression than others.	Single center. Suboptimal response rate. One-time survey--no longitudinal data.
Tan BYQ, et al. Singapore <sup>17</sup>	Self-administered questionnaire assessed depression, stress, anxiety, and PTSD among all HCWs. Demographics, medical history, DASS-21, IES-R.	470 HCWs at two institutions caring for COVID-19 patients in Singapore, (94% response rate). 68.3% female, 28.7% physicians, 34.3% nurses; others included allied HCWs, technicians, clerical staff, administrators, and maintenance workers.	14.5% screened positive for anxiety; 8.9% for depression; 6.6% for stress; 7.7% for clinical concern of PTSD. Anxiety was higher among nonmedical HCWs than medical HCWs (20.7% vs. 10.8%).	Self-report not verified with medical records, no socio-economic status and done only in Singapore.
Chew NWS, et al. Singapore & India <sup>18</sup>	Self-administered questionnaire assessed demographics, medical history, physical symptom prevalence in last month, DASS-21, IES-R. Prevalence of and associations between physical symptoms and psychological outcomes of depression, anxiety, stress, and PTSD were evaluated.	906 HCWs included doctors, nurses, allied HCW, administrators, clerical staff, maintenance workers from 5 major tertiary hospitals in Singapore and India involved in care of COVID-19 pts (90.6% response rate). 64.5% female. 22.6% had preexisting comorbidities. 39.2% nurses, 29.6% physicians, 10.6% allied HCWs.	5.3% had moderate to severe depression; 8.7% for moderate to extremely severe anxiety; 2.2% for moderate to extremely severe stress; 3.8% for moderate to severe levels of psychological distress. 33.4% of participants reported > 4 symptoms. Most common was headache (32.3), Depression, anxiety, stress, and PTSD were associated with symptoms in the previous month and symptoms were associated w/higher mean scores in IES-R, DASS Anxiety, Stress and Depression subscales.	Cross-sectional design unable to establish causality of stress to symptoms. Socioeconomic and educational status not considered.
Si MY, et al. China <sup>19</sup>	Cross-sectional survey assessed demographics, general health status, IES-6, DASS, and related psychological factors like perceived threat, social support, and coping strategies.	863 HCWs from 7 provinces in China completed the questionnaire (76.0% response rate). 70.7% female. 43.7% doctors, 24.4% nurses 31.9% other HCWs. 25.6% had ever been quarantined or isolated during the outbreak. 16.8% were frontline medical workers. 74.0% were highly concerned about the epidemic.	40.2% - significant PTSD symptoms; 97.9% - at least one PTSD symptom; 13.6% had depression symptoms; 13.9% had anxiety; 8.6% had stress. Perceived threat and passive coping strategies were positively correlated to PTS and DASS scores. Perceived social support and active coping strategies were negatively correlated to DASS scores. Nurses more likely to be anxious than other HCWs.	Study conducted in China when it was the country most affected by COVID-19, limiting generalizability.
Xing LQ, et al. Jinan, China <sup>20</sup>	Cross-sectional survey among frontline HCWs assessed demographics, and stress using self-rating anxiety scale (SAS), self-rating depression Scale (SDS).	309 HCWs working in 4 isolation wards and 1 fever clinic set up for COVID-19 (100% response rate). 11.3% physicians, 88.7% nurses. 97.4% female.	28.5% screened positive for anxiety; 56.0% screened positive for depression. Age 30 or younger, age >30 to 45, and worrying about inadequate disinfection measures were all independently associated with both anxiety and depression.	Small sample size, single center. Physicians and nurses only.
Romero CS, et al., Spain <sup>22</sup>	National cross-sectional 45-item survey assessed a psychological stress and adaptation work score (PSAS score) via Healthcare Stressful Test, Coping Strategies Inventory, Font-Roja Questionnaire and TMMS	3109 HCWs across Spain in different health care settings including physicians (subspecialties), nurses, respiratory and other therapists, support staff, administrators.	Respiratory Medicine perceived highest psychosocial impact followed by geriatrics. The stress perceived was parallel to the number of cases per 100 000 people.	Unknown prior stress levels and > 66% from a second least-affected area leading to underestimation
Kang L, et al., China <sup>23</sup>	Anonymous self-rated questionnaire assessed demographics, mental health, risks of COVID-19 exposure, access to mental healthcare and self-perceived health status compared to pre-COVID period	994 HCWs, Physicians 18.4%, nurses 81.6%, females 85.5%.	Mental health disturbances: 36.9% had subthreshold, 34.4% mild, 22.4% moderate, and 6.2% severe. The burden fell particularly heavily on young women.	Self-report Cross-sectional design

Abbreviations: COVID-19 - Coronavirus disease 2019, CES-D – Center for Epidemiological Studies Depression, DASS-21 – Depression, Anxiety and Stress Scale - 21 items, ERI – Effort Reward Imbalance, FEWS – Frankfurt Emotion Work Scale, GAD – Generalized Anxiety Disorder, GADS- Goldberg Anxiety Depression scale, HCW – Health Care Worker, IES (-R) – Impact of Event Scale (-revised), ISI – Insomnia severity Index, MHI – Mental Health Inventory, OASIS – Outcome and Assessment Information Set, PHQ – Patient Health Questionnaire, PPE – Personal Protective Equipment, PSM-25 – Psychological Stress Measure (25 item scale), PSS-10 – Perceived Stress Scale – 10 item, PTSD – Post-traumatic stress disorder, PC-PTSD-5 – Primary Care PTSD screen for DSM 5, SAS - Self-rating Anxiety Scale (SAS), SCI – Sleep Condition Indicator, SDS – Self Rating Depression Scale, STAI-S – State Trait Anxiety Inventory Scale, TMMS – Trait Meta Mood Scale, UN – United Nations, UNIPSCO - Unidad de Investigación Psicosocial de La Conducta Organizacional, CESQT - Cuestionario para la evaluación del síndrome de quemarse por el trabajo,



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# The Influence of Religious Belief on Burnout in Medical Students

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To our knowledge, this is the first study within the U.S. to examine the relationship between religious affiliation and burnout in medical students.



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## Abstract

### Objective

Approximately half of all U.S. medical students are experiencing burnout. A previous study has demonstrated that higher levels of spirituality are associated with less burnout in medical students, yet no studies have examined the relationship between religious affiliation and burnout in medical students. The purpose of this study is to determine if specific religious affiliation and level of religious involvement is associated with less burnout in medical students.

### Methods

A cross-sectional online survey was sent to all students attending five different osteopathic and allopathic medical schools in Kansas and Missouri. It contained a validated burnout measure, an item to identify religious affiliation, and items to quantify religious involvement.

### Results

A response rate of 11.5% (495/4,300) was obtained. An ANOVA showed religious affiliations and burnout scores did not have any statistically significant relationships ( $F = 0.762$ ,  $P = 0.619$ ). Additionally, identification as an active participant within a religious affiliation had a statistically

significant effect on burnout scores ( $F = 7.793$ ,  $P = 0.005$ ).

### Conclusions

This is the first study within the U.S. to show that religious affiliation is not associated with medical student burnout and that medical students who consider themselves to be active participants of their religion may be at lower risk of developing burnout, regardless of the faith they practice.

### Background

Burnout is defined as a “state of exhaustion in which one is cynical about the value of one’s occupation and doubtful of one’s capacity to perform.”<sup>1</sup> As a topic that has been studied for decades, burnout has been notably recognized among physicians. It is estimated that approximately 45.8% of U.S. physicians are experiencing burnout.<sup>2</sup> Patients appear to also be impacted by this phenomenon, as studies have shown an increased frequency of self-perceived medical errors in physicians experiencing burnout.<sup>3,4</sup>

A more recent topic of study is burnout during physician training, specifically during medical school. Multiple investigations have been conducted to assess the prevalence of burnout in medical students and physicians which have demonstrated that the prevalence

is variable, ranging from 2% to 76% based on the study samples, inclusion and exclusion criteria and geographic location.<sup>16,17,18,19,20,21,22</sup>

In comparison to U.S. college graduates ages 22-32 years old, U.S. medical students have a higher prevalence of burnout.<sup>5</sup> It is estimated that nearly 50% of all students enrolled in U.S. medical schools are experiencing burnout.<sup>6</sup> Medical student burnout has been found to be more than a transient process and is associated with life-changing events. One study found that burnout in medical students is associated with increased likelihood of serious thoughts of dropping out.<sup>7</sup> Another found that burnout in medical students even predicts suicidal ideation.<sup>6</sup>

A great deal of research has been dedicated to understanding how religion and spirituality influence burnout among health care workers. Spiritual well-being is associated with less burnout and greater resilience, particularly among nurses who work in high intensity settings.<sup>8,9,10</sup> However, few efforts have been made to examine the role of religion in the prevention of burnout in medical students. A study by Wachholtz and Ragoff that surveyed medical students at a New England public medical school explored the relationship between levels of spirituality and burnout. They found that students with higher levels of spirituality are less likely to experience burnout.<sup>11</sup> They additionally collected religious affiliations (i.e. Buddhist, Hindu, Muslim, etc.) of the students surveyed, but did not provide analysis outside of percentages of their sample size that identified with each religion.

The aim of our study is to explore the relationship between religion and burnout in medical students. Our goal is to determine if specific religious affiliation and level of religious involvement is associated with lower burnout scores in medical students.

**Table 1.** Socio Demographic Characteristics

Variables	Category	
Religion n (%)	Agnostic	87 (17.6%)
	Atheist	68 (13.7%)
	Buddhist	3 (.6%)
	Christian	276 (55.8%)
	Hindu	13 (2.6%)
	Jewish	5 (1%)
	Muslim	16 (3.2%)
	Other	27 (5.5%)
Active Participant n (%)	Yes	271 (54.7%)
	No	224 (45.3%)
Religious Holidays n (%)	Yes	372 (75.2%)
	No	123 (24.8%)
Attend Service mean (SD)	21.80 (27.313)	
Hours/week mean (SD)	1.88 (3.042)	
Burnout Score mean (SD)	3.185 (1.0890)	

## Methods

### Study Design

This was an observational cross-sectional study using an anonymous online survey. Outcome assessments are religious affiliation, religious involvement, and level of burnout.

### Participants

The sample was comprised of medical students of all four years attending five different allopathic and osteopathic medical schools in the states of Missouri and Kansas. Participants were not provided compensation for their participation.

### Procedures

An introductory email with an informed consent statement with an online anonymous survey was sent to student affairs staff at each medical school using Research Electronic Data Capture (REDCap). Study data were collected and managed using REDCap electronic data capture tools hosted at the University

**Table 2.** ANOVA results of participant characteristics of Burnout study

	Burnout Score				
	SS	D.F.	MS	F	p*
<b>Religion</b>	6.335	7	0.905	0.762	.619
<b>Active participant</b>	9.098	1	9.098	7.793	.005**
<b>Religious Holidays</b>	12.590	2	5.295	5.414	.005**

\*p<0.05 is statistically significant

\*\*p<0.01 is statistically significant

R<sup>2</sup> = 0.106; Adj. R<sup>2</sup> = 0.061

**Table 3.** Cross tabulation of religious affiliations by burnout category score

Burnout Score	Religious affiliation								p*
	Agnostic	Atheist	Buddhist	Christian	Hindu	Judaism	Muslim	other	
<b>Low</b>	20(23)	24(35.5)	2(66.7)	77(27.9)	2(15.4)	2(40)	4(25)	6(21.4)	.858
<b>Medium</b>	30(34.5)	22(32.4)	0(0)	88(31.9)	4(30.8)	1(20)	5(31.3)	10(35.7)	
<b>High</b>	37(42.5)	22(32.4)	1(33.3)	111(40.2)	7(53.8)	2(40)	7(43.8)	12(42.9)	

Pearson  $\chi^2$  test with linear tendency ( $P < 0.05$ )

Subset of sample for each category (column proportions)

of Kansas Medical Center. REDCap is a secure web-based software platform designed to support for research studies.<sup>14,15</sup> Each school distributed this letter to medical students enrolled at their institution by email or online newsletter. The REDCap survey included the Burnout Measure-Short Version and questions regarding religious affiliation and level of involvement. The survey was made available for three months in 2019.

*Burnout Measure-Short Version*

The Burnout Measure-Short Version is a 10-item, 7 point Likert scale which assesses career burnout.<sup>12</sup> It is a shorter form of the Burnout Measure, which is comprised of 21 items that defines burnout as physical, emotional, and mental exhaustion.<sup>13</sup> A high correlation has been demonstrated between burnout scores obtained with both the Burnout Measure-Short Version and the Burnout Measure.<sup>13</sup> The Burnout Measure-Short Version has adequate internal

consistency among various cultures and occupations as well as high stability as indicated by a three-month test-retest coefficient of 0.74.<sup>13</sup> It has been validated through correlational analysis with several relevant variables across various populations, such as police officers, healthcare workers, and graduate students.<sup>13</sup>

*Religious Affiliation and Involvement*

Participants were asked in the online anonymous REDCap survey to identify their religious affiliation (Buddhist, Christian, Hindu, Jewish, Muslim, or Other) with the additional options of agnostic and atheist. They were also asked if they considered themselves an active participant of their religion and if they only attend religious services on religious holidays, both with answer options of “yes” or “no”. To quantify religious involvement, participants were asked how often in a year each participant attended religious services and how many hours they spend in religious activity each week.

The University of Kansas Medical Center Institutional Review Board reviewed and approved the protocol for this study.

### Statistical Analysis

In this section, we present the statistical analysis and empirical results for our study. We generated descriptive statistics for continuous variables and frequencies and percentages for categorical variables. One-way analysis of covariance (ANOVA) was conducted to assess the effect of religious affiliations and level of involvement on burnout scores. Statistically significant results of religious affiliations, active participation, and attending services only on religious holidays were assessed. Visual inspection of the residual plots and their empirical histograms were used to check the model assumptions. Prior to conducting the ANOVA test, the homogeneity of variance assumption was tested for all burnout measurement scales. Based on Levene's F test, the homogeneity of variance assumption was considered satisfied, suggesting that ANOVA analysis would be robust for our study. Finally, a post-hoc analysis (Tukey's method) was performed to examine the pairwise mean difference across all religious affiliations and burnout scores.

We also completed a sensitivity analysis by conducting a Pearson chi-square test to measure the association between burnout scores (characterized as low, medium, and high scores) and religious affiliations. A Fisher exact test was substituted if 80% of the cells had an expected cell count of fewer than five. We used a p value of <0.05 as the threshold for statistical significance level. This approach allowed us to reduce the type I error rate to detect significant findings. Data manipulation and statistical analysis were performed with the R-Studio (Version 1.1.423) and the Statistical Package for Social Sciences (SPSS) version 22.0.

### Results

A response rate of 11.5% was obtained, (495 surveys completed out of the total 4,300 medical students who received the email invitation). Study participant demographics are shown in Table 1. In this sample 276 (55.8%) identified as Christian, 16 (3.2%) Muslim, 13 (2.6%) Hindu, 5 (1%) Jewish, 87 (17.6%) agnostic, 68 (13.7%) atheist, and 27 (5.5%) identified with other religious affiliations. Two hundred and seventy-one (54.7%) identified as active participants

within their religion. Three hundred and seventy-two (75.2%) indicated they attend services only on religious holidays. On average, participants reported spending 1.88 hours per week in religious activity and 21.8 instances per year of attending religious services.

Results from the ANOVA are in Table 2. Religious affiliations and burnout scores were not found to have any statistically significant relationships ( $F=0.762$ ,  $P=0.619$ ). Identification as an active participant within a religious affiliation had a statistically significant effect on burnout scores ( $F=7.793$ ,  $P=0.005$ ). Identification as only attending services on religious holidays had a statistically significant effect on burnout score as well ( $F=5.414$ ,  $P=0.005$ ). Results from the Tukey HSD post ad-hoc pairwise comparison analysis also indicated no statistically significant effect between burnout and various religious affiliations in medical students among each group.

As part of our sensitivity analysis, we conducted a categorical analysis (Pearson chi-square test) by considering burnout scores as categorical variables shown in Table 3. There was no association ( $P=0.858$ ) found between burnout category (low, medium, and high) and religious affiliations in medical students, further supporting our previous analysis which considered burnout scores as continuous measurements.

### Discussion

We found that there were no significant differences among the various religious affiliations in having lower burnout scores in medical students. In other words, no religious affiliation had significantly lower burnout scores compared to the others.

We additionally found that self-perception in that one is an active participant within one's religion is associated with lower burnout scores. However, there is no significant relationship between hours spent per week on religious activity and number of instances in a year spent participating in religious services. Medical students already pressed for time due to their heavy volume of studies may wonder how much participation within their religion is adequate to prevent burnout. Our study shows that self-identification as being an active participant alone is associated with lower burnout scores and that no exact quantification of time is associated with less burnout.

Interestingly, medical students who selected that they only attended religious services on religious holidays had significantly lower burnout scores. It is challenging to decipher why only attending religious services on religious holidays is associated with less burnout. We are interested in further studying this group within our sample to determine if other factors, such as demographics, contribute to this effect. Additionally, the question style of this item may have led to a misunderstanding among participants, such as perceiving that the question asked if the participant attended religious services on holidays, rather than “only” on holidays.

There are likely many factors that influence medical student burnout, religion being a piece of this puzzle. Our findings show no particular religious affiliation is associated with less burnout compared to others in medical students. Additionally, our study gives evidence that self-perception as being an active participant in religion and only attending services on religious holidays is associated with less burnout in medical students.

The limitations of our study include low response rate, a relatively small geographic distribution of our sample, lack of demographic information, and the working of the religious services questions. A poor response rate may have in fact be due to medical student burnout, causing them to avoid the survey. Additionally, those who responded to the survey likely possess pro-social behavior characteristics, potentially skewing the data. Future investigations should further explore the relationship between burnout and religious affiliation in both medical students and the general population using similar surveys. Additionally, future efforts should be made to collect qualitative reports from students in survey format to identify which aspects of their religious affiliation they find to be most protective against burnout, as this may further direct future studies.

## Conclusion

To our knowledge, this is the first study within the U.S. to examine the relationship between religious affiliation and burnout in medical students. Our results suggest that medical students who consider themselves to be active participants of their religion may be at lower risk of developing burnout, regardless of the faith they practice.

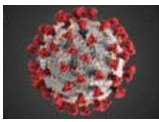
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## Disclosure

None reported.

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# Magnesium and Vitamin D Deficiency as a Potential Cause of Immune Dysfunction, Cytokine Storm and Disseminated Intravascular Coagulation in COVID-19 Patients

by James J. DiNicolantonio, PharmD & James H. O'Keefe, MD

Patients with COVID-19 who received the magnesium and vitamin D and B12 had an 87% lower risk for requiring oxygen therapy and an 85% lower risk for needing intensive care support.



James J. DiNicolantonio, PharmD, (left), and James H. O'Keefe, MD, (right), are at Saint Luke's Mid America Heart Institute, Kansas City, Missouri.

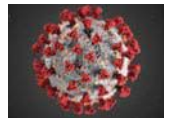
## Abstract

Magnesium and vitamin D each have the possibility of affecting the immune system and consequently the cytokine storm and coagulation cascade in COVID-19 infections. Vitamin D is important for reducing the risk of upper respiratory tract infections and plays a role in pulmonary epithelial health. While the importance of vitamin D for a healthy immune system has been known for decades, the benefits of magnesium has only recently been elucidated. Indeed, magnesium is important for activating vitamin D and has a protective role against oxidative stress. Magnesium deficiency increases endothelial cell susceptibility to oxidative stress, promotes endothelial dysfunction, reduces fibrinolysis and increases coagulation. Furthermore, magnesium deficient animals and humans have depressed immune responses, which, when supplemented with magnesium, a partial or near full reversal of the immunodeficiency occurs. Moreover, intracellular free

magnesium levels in natural killer cells and CD8 killer T cells regulates their cytotoxicity. Considering that magnesium and vitamin D are important for immune function and cellular resilience, a deficiency in either may contribute to cytokine storm in the novel coronavirus 2019 (COVID-19) infection.

## Introduction

Approximately half of adults in the United States do not consume the recommended dietary allowance for magnesium.<sup>1</sup> It has been estimated that up to 30% of a given population has subclinical magnesium deficiency based on serum levels and magnesium deficiency can be as high as 80-90% in certain populations when utilizing magnesium load testing.<sup>1</sup> Many factors contribute to magnesium deficiency, including diets with refined and processed foods, chronic disease states (kidney disease, gastrointestinal disorders, cancer), medications (diuretics, insulin, proton pump inhibitors), stress, strenuous exercise, and vitamin D deficiency to name a few.<sup>1</sup> Thus, subclinical



magnesium deficiency is relatively common among the general population and a deficiency in magnesium could impair immune function. This review will cover the potential mechanisms by which magnesium and vitamin D deficiency could drive immune dysregulation contributing to cytokine storm and ultimately endothelial dysfunction in COVID-19 giving rise to disseminated intravascular coagulation (DIC).

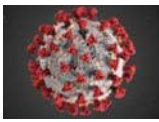
### Supplementing COVID Patients with Magnesium and Vitamin D May Improve Outcomes

A recent study from Singapore highlights the potential role of magnesium for improving coronavirus (COVID) outcomes.<sup>2</sup> The study was an observational cohort study of consecutive hospitalized COVID-19 patients aged 50 and above in a tertiary academic hospital. Between January 15 and April 15, 2020, 43 consecutive COVID-19 patients aged 50 and above were included in the study. Seventeen patients received magnesium 150 mg, vitamin D3 1,000 IU, and vitamin B12 500 mcg once daily, and 26 patients did not. Baseline demographic characteristics did not significantly differ between the groups. Those who received the magnesium plus vitamin D and B12 had an 87% lower risk for requiring oxygen therapy and an 85% lower risk for needing intensive care support. Moreover, those who did not receive the vitamin/mineral supplement had a 3.5-fold higher rate of needing oxygen therapy throughout hospitalization versus those who received the vitamin/mineral supplement (61.5% vs. 17.6%,  $p=0.006$ ). The authors concluded, “Magnesium, vitamin D, and B12 combination in older COVID-19 patients was associated with a significant reduction in proportion of patients with clinical deterioration requiring oxygen support and/or intensive care support.”<sup>2</sup>

In a preprint, vitamin D insufficiency was identified in 84.6% of severe COVID-19 patients in the intensive care unit.<sup>3</sup> Thus, supplementing COVID-19 patients with vitamin D, especially if they are vitamin D deficient and utilizing concomitant magnesium, which is required to activate vitamin D<sup>4</sup> could provide benefit. Moreover, a recent pilot randomized clinical

study in 50 hospitalized COVID-19 patients showed that calcifediol, a hydroxylated analog of vitamin D, significantly reduced the need for intensive care unit treatment compared to those who did not receive calcifediol.<sup>5</sup> This again further supports the idea that vitamin D may be beneficial in COVID-19 patients. To be fair, the group that did not receive calcifediol had a higher percentage of individuals with hypertension and diabetes at baseline, both of which are risk factors for poor COVID-19 outcomes. Thus, this pilot clinical trial would need to be replicated in larger clinical study to confirm these results.

However, several recent studies testing vitamin D supplementation confirm its possibility for utility in COVID-19 patients. The SHADE study gave 60,000 IU/day of vitamin D as a nano-liquid or placebo to 40 asymptomatic or mildly symptomatic COVID patients with vitamin D deficiency.<sup>6</sup> Vitamin D supplementation was given for up to 14 days until a vitamin D blood level of 50 ng/ml was achieved. By day 21, three times as many patients in the vitamin D group were SARS-CoV2 negative (62.5%) vs. placebo (20.8%) ( $p < 0.018$ , for the difference). Thus, this randomized controlled trial suggests that vitamin D supplementation in vitamin D deficient asymptomatic or mildly symptomatic COVID patients helps to clear the virus quicker. Another study, this time a preprint multicenter, double-blind, randomized controlled trial, gave a single dose of 200,000 IU of vitamin D3 in 240 hospitalized patients with severe COVID.<sup>7</sup> These individuals were far out in their course of COVID, with an average of 10.2 days after symptom onset. Importantly, their average baseline vitamin D levels were not deficient but were insufficient. Despite this, mechanical ventilation was cut in half in the vitamin D group (7%) compared to placebo (14.4%), which just missed statistical significance ( $p=0.090$ ). Importantly, at baseline, the vitamin D group had a higher percentage of sore throat ( $p = 0.026$ ) and nearly significantly more patients with diabetes ( $p = 0.058$ ). This may have prevented the results from reaching statistical significance.



## Magnesium Deficiency Leads to Immune Dysregulation

It was recently discovered that intracellular free magnesium regulates the cytotoxic functions of natural killer (NK) and CD8<sup>+</sup> T cells<sup>8</sup> and that decreased intracellular free magnesium causes defective expression of the natural killer activating receptor NKG2D on NK and CD8<sup>+</sup> T cells and impairs their cytolytic responses. Decreased intracellular free magnesium levels also causes defective expression of programmed cell death 1 in both NK and CD8<sup>+</sup> T cells.<sup>9</sup>

Cytotoxic T cells, also known as CD8<sup>+</sup> T cells or killer T cells, kill viruses in a way that leads to a silent apoptotic death.<sup>10</sup> However, when CD8<sup>+</sup> T cells lose their cytotoxic activity, this puts a burden on the innate immune cells, such as macrophages and neutrophils, which kill viruses in a proinflammatory way. Furthermore, the reduction in CD8<sup>+</sup> T cell viral killing, alongside greater innate immune cell viral killing, leads to an increased death of healthy bystander cells leading to a greater proinflammatory response.<sup>10</sup> Thus, a reduction in CD8<sup>+</sup> T cell cytotoxicity appears to be a primary underlying contributor of immune dysfunction and proinflammatory killing that likely increases the risk of cytokine storm in the lungs. Indeed, the functional exhaustion of cytotoxic lymphocytes, such as T lymphocytes and natural killer cells, are correlated with COVID-19 disease progression.<sup>11</sup> Thus, strategies that can improve CD8<sup>+</sup> T cell cytotoxicity may have utility by improving RNA viral clearance and reducing inflammatory cytokine storms in the lungs.

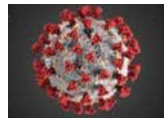
Tissue factor expression is a principle initiator of the coagulation cascade and nuclear factor-kappa beta (NF-KB) signaling increases tissue factor expression.<sup>12</sup> This can be inhibited with magnesium supplementation.<sup>13, 14</sup> Lastly, magnesium, likely through its ability to inhibit NF-KB, decreases inflammatory cytokine production from monocytes.<sup>15</sup> Additionally, magnesium deficiency primes leukocyte and macrophage inflammatory responses by increasing cellular calcium levels.<sup>16</sup> All of this suggests that a deficiency in magnesium promotes chronic low-grade inflammation, increased inflammatory responses during viral infections and a pro-thrombotic state.

Patients with genetically low intracellular free magnesium levels secondary to a magnesium transporter deficiency, have uncontrolled chronic Epstein-Barr virus expression and an increased risk of lymphoma.<sup>8</sup> When these individuals are supplemented with magnesium L-threonate, there is a partial restoration in CD8<sup>+</sup> T cell cytotoxicity and near complete restoration in NK cell cytotoxicity, along with a reduction in Epstein-Barr viral load and an increase in intracellular free magnesium levels.<sup>8</sup> Thus, genetic intracellular magnesium deficiency leads to acquired human immunodeficiency and can essentially be reversed through magnesium supplementation. Intracellular free magnesium levels also play a key role in the control of hepatitis B viral infection. Indeed, as already discussed, decreased intracellular free magnesium levels causes defective expression of programmed cell death 1 in both NK cells and CD8<sup>+</sup> T cells.<sup>9</sup> Lastly, low intracellular free magnesium levels have been found in patients with Type 2 diabetes, which may partially explain their increased susceptibility to RNA viruses.<sup>17</sup>

## Magnesium Deficiency Increases Oxidative Stress and Cytokine Storm

Magnesium deficiency leads to increased oxidative stress and intracellular glutathione depletion.<sup>18</sup> There is also an increase in inflammatory cytokine release from monocytes, macrophages and leukocytes during magnesium deficiency,<sup>15, 16</sup> whereas magnesium supplementation reduces these effects,<sup>15</sup> which may be due to reduced Nuclear Factor Kappa-Beta (NF-KB) activation. Moreover, magnesium deficiency increases the susceptibility of tissues to oxidative stress<sup>19</sup> and decreases antioxidant defenses,<sup>20</sup> which may increase damage to pulmonary alveoli from cytokine storms during magnesium deficiency. Moreover, magnesium deficiency increases proinflammatory cytokines leading to endothelial dysfunction.<sup>21</sup> Thus, having a low magnesium status may increase the risk for inflammatory cytokine storms, damage to the endothelium and trigger the coagulation cascade leading to disseminated intravascular coagulation (DIC).





**Table 1: Reasons why Magnesium and Vitamin D Deficiency may lead to Immune Dysfunction, Cytokine Storm and Disseminated Intravascular Coagulation in COVID-19 patients**

Low intracellular free magnesium levels in NK and CD8 <sup>+</sup> T cells reduces their cytotoxicity.
Patients with genetically low intracellular free magnesium, who are supplemented with magnesium, have a partial or near complete reversal of dysfunctional NK and CD8 <sup>+</sup> T cells and a reduced viral load.
Dysfunctional CD8 <sup>+</sup> T cell cytotoxicity leads to increased proinflammatory death in virally infected cells and healthy bystander cells, as opposed to silent apoptotic death, increasing the risk of cytokine storm in the lungs.
Magnesium activates vitamin D into the hormone calcitriol.
Active vitamin D is required to boost the expression of cathelicidins.
Magnesium deficiency slows fibrinolysis and increases coagulation and thrombosis.
Low magnesium status increases damage to tissues and cellular membranes and reduces antioxidant defense systems leading to increased oxidative stress and damage.
Magnesium deficient animals have a depressed immune response. <sup>45</sup>

### Magnesium Deficiency Increases Endothelial Dysfunction and Coagulation

Magnesium deficiency increases the susceptibility of endothelial cells to oxidative damage and promotes endothelial dysfunction,<sup>18, 21</sup> whereas magnesium supplementation improves endothelial function.<sup>22</sup> Magnesium also has antithrombotic effects,<sup>23, 24</sup> reducing ex vivo platelet aggregation and increasing in vivo blood clotting times.<sup>25</sup> Lower serum magnesium is associated with increased thrombotic risk and slowed fibrinolysis<sup>26-28</sup> and low intracellular magnesium promotes platelet-dependent thrombosis.<sup>29</sup> Moreover, magnesium has antithrombotic effects and reduces mortality in in vivo experiments of induced pulmonary thromboembolism.<sup>30</sup> All of this suggests that magnesium deficiency in patients with COVID-19 increases the risk of disseminated intravascular coagulopathy.

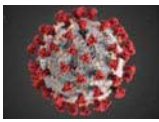
### Magnesium is Required to Activate Vitamin D

Magnesium is needed to move vitamin D around in the blood and to activate vitamin D.<sup>4</sup> Magnesium deficiency can also reduce active vitamin D (1,25 dihydroxyvitamin D) levels and impair parathyroid hormone response.<sup>31</sup> This may lead to “magnesium-dependent vitamin-D-resistant rickets.”<sup>32</sup> Magnesium is also required to inactivate vitamin D when levels

become too elevated.<sup>4</sup> Thus, optimal magnesium status is required for optimal vitamin D status.<sup>33</sup> Both magnesium and vitamin D are important to the immune system independently. Together, they may be beneficial in COVID-19 infection because magnesium is necessary to activate vitamin D.

### Vitamin D and Its Importance for Immune Health

It is estimated that one billion people worldwide are vitamin D deficient and around half the global population is vitamin D insufficient.<sup>34</sup> <sup>35</sup> Epidemiologically, influenza infection is most common worldwide when vitamin D levels are at their lowest.<sup>36</sup> Vitamin D is a fat-soluble vitamin that plays a major role in immune function. Indeed, vitamin D receptors are expressed on numerous immune cells including B cells, T cells, and antigen presenting cells.<sup>37</sup> Additionally, monocytes, macrophages, dendritic cells, B cells and T cells are capable of converting vitamin D into its active form, calcitriol, modifying the expression of hundreds of genes including those for cytokine production.<sup>36</sup> Indeed, calcitriol has the ability to reduce proinflammatory cytokines and increase anti-inflammatory cytokines.<sup>38</sup> This suggests that maintaining adequate vitamin D levels may be important for reducing inflammatory cytokine storms.



A meta-analysis of 25 randomized controlled trials in over 11,000 participants showed that vitamin D supplementation significantly reduces the risk of acute respiratory infections in the overall population by 12% and in those with profound vitamin D deficiency at baseline (25-hydroxyvitamin D level of < 25 nmol/l) by 70%.<sup>39</sup> These benefits were noted in individuals taking daily or weekly vitamin D supplementation. Another meta-analysis of 11 placebo-controlled trials in 5,660 patients showed that vitamin D supplementation reduced the risk of respiratory tract infections by 36%, with greater benefits in those using once-daily dosing (49% reduction) as compared to bolus doses (14% reduction).<sup>40</sup> Thus, vitamin D supplementation seems to protect against respiratory tract infections with the greatest benefits being found with once daily dosing.

As noted previously, vitamin D insufficiency is highly prevalent in severe COVID-19 patients.<sup>3</sup> This provides sound scientific reasoning for vitamin D supplementation in COVID patients. Patients who have had their vitamin D levels measured in the year before COVID-19 testing, the relative risk of testing positive for COVID-19 was 1.77 times greater for those who were deficient in vitamin D compared to those who were sufficient.<sup>41</sup> Both 25-hydroxyvitamin D<sub>3</sub> and 1,25 dihydroxyvitamin D<sub>3</sub> inhibit proinflammatory cytokine release in human monocytes.<sup>34</sup> However, this only seems to occur when vitamin D levels are adequate. Indeed, it was discovered that 15 ng/ml of 25-hydroxyvitamin D<sub>3</sub> (indicating insufficient serum vitamin D levels in humans) was not able to suppress LPS-induced p38 phosphorylation, whereas significant inhibition of LPS-induced p38 phosphorylation was achieved with 30 ng/ml or higher. Importantly, maximum inhibition was achieved with vitamin D levels of 50 ng/ml of 25(OH)D<sub>3</sub>. Similarly, a dose-dependent inhibition of LPS-induced p38 activation was observed in human monocytes when the cells were pretreated with active vitamin D. The maximum inhibitory effect was achieved when the cells were preincubated

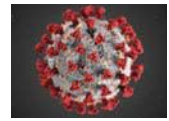
with 0.4 ng/ml of 1,25 dihydroxyvitamin D<sub>3</sub>.<sup>34</sup> Lipopolysaccharide, can induce inflammatory and procoagulant responses<sup>42</sup> likely through the activation of Toll-like receptor 4 (TLR4).<sup>43</sup> The binding of LPS to TLR4 on monocytes triggers the activation of mitogen-activated protein kinase (MAP kinase), ERK, JNK, p38 and nuclear factor-kappa-B, and regulates proinflammatory cytokine production leading to unresolved inflammation.<sup>34</sup> Mitogen-activated protein kinase phosphatases (MKP) can inactivate MAP kinases and Mitogen-activated protein kinase dual-specificity phosphatase-1 (MKP-1) attenuates p38 activation, which is up-regulated by vitamin D. Furthermore, active vitamin D, which requires magnesium, is needed to boost the expression of antimicrobial cathelicidin peptides, which have numerous antiviral effects.<sup>44</sup> Thus, both vitamin D and magnesium deficiency likely contribute to persistent inflammation independently, and work together, as magnesium is needed to activate vitamin D. Table 1 summarizes the reasons why magnesium and vitamin D deficiency may lead to immune dysfunction, cytokine storm and disseminated intravascular coagulation in COVID-19 patients.

## Conclusion

Magnesium and vitamin D supplementation should be considered in the general population with special consideration during the COVID-19 pandemic.

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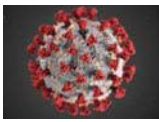


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## Disclosure

JJD is Director of Scientific Affairs at Advanced Ingredients for Dietary Products. JHO is an owner of a nutraceutical company.

MM



# COVID-19 Convalescent Plasma: From Donation to Treatment – A Systematic Review & Single Center Experience

by Michela M. Fabricius, BS & Dima Dandachi, MD



The rapid establishment of a COVID-19 convalescent plasma program has thus far been successful.



**Michela M. Fabricius, BS**, (above), is a Medical Student and Dima Dandachi, MD, MPH, is Assistant Professor of Clinical Medicine, Medical Director, Outpatient Parenteral Antimicrobial Therapy (OPAT) and Vascular Access, and Medical Director, HIV/AIDS Program; both are at the University of Missouri-Columbia, Columbia, Missouri.

## Abstract

**Convalescent plasma is an old treatment for a new disease. The coronavirus disease 2019 (COVID-19) pandemic caused the analysis of convalescent plasma to reemerge as a possible treatment. First, a systematic review summarizes the available research examining the use of convalescent plasma for the treatment of patients with COVID-19. Second, we describe our experience in establishing a single-center convalescent plasma donation program.**

## Introduction

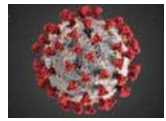
In 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was identified amidst an outbreak of respiratory symptoms in Wuhan, China.<sup>1,2</sup> This disease spread rapidly into an epidemic during the early winter of 2020. It wasn't until March 11, 2020, that the World Health Organization (WHO) declared that corona virus disease 2019 (COVID-19) was now a pandemic.<sup>3</sup>

As of January 11, 2021, the Johns Hopkins Coronavirus Resource Center website reports there are about 90,475,499 total cases with 1,938,349 deaths in 191 countries/regions reporting.<sup>4</sup>

Furthermore, as of January 11, 2021, the CDC reports that the United States has had more than 22 million confirmed cases of COVID-19 and 373,167 deaths.<sup>5</sup>

Public health measures such as traffic restriction, social distancing measures, home isolation, centralized quarantine, and improvement of medical resources have been shown to disrupt the spread of this disease.<sup>6</sup> Yet, to date, neither specific treatments nor a vaccine are readily available and strategy is largely supportive.<sup>2,7-8</sup> However, by the time this article is published, vaccinations will most likely be available for health care workers and nursing home residents as recommended by the Advisory Committee on Immunization Practices at their December 1, 2020, meeting.<sup>9</sup>

The potential of convalescent plasma (CP), a form of passive immunity, as a treatment for emerging diseases is not new. Use of this as treatment can be traced back into the early 1900s with the Spanish flu.<sup>10</sup> In 2015, a systematic review and meta-analysis revealed significant reduction in the odds of mortality following treatment with convalescent plasma for SARS-CoV-1, H1N1, H5N1, and H1N1.<sup>11</sup> Similarly, the WHO



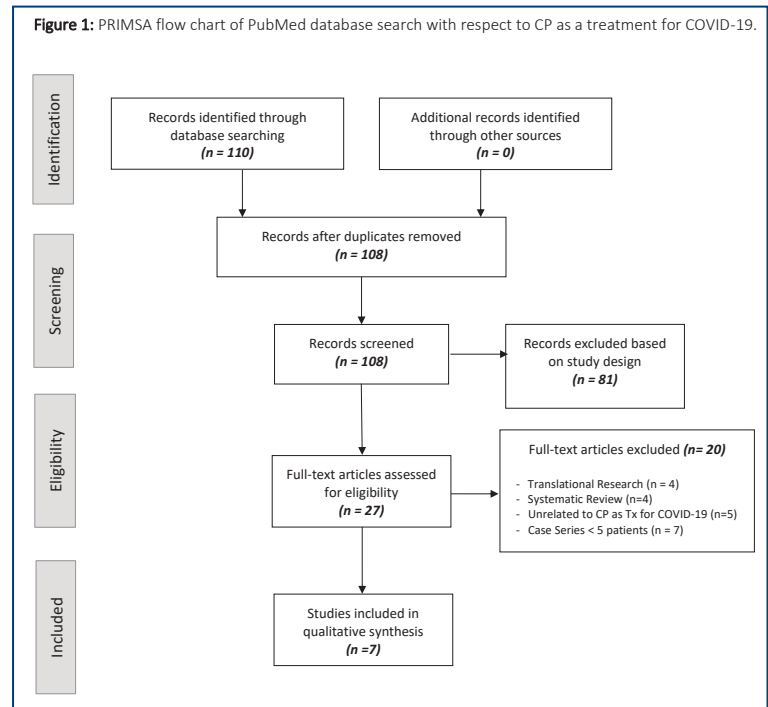
prioritized the evaluation of convalescent plasma for the recent Ebola epidemic.<sup>12</sup> However, a more recent systematic review and meta-analysis indicated little efficacy of convalescent plasma in the treatment of SARS-CoV-1 or influenza.<sup>13</sup> The need for large-scale evaluation of convalescent plasma is imperative.

Translational studies show that the spike (S) protein of SARS-CoV-2 mediates the virus's entry into cells. It does so via binding to the ACE-2 receptor with its receptor binding domain (RBD).<sup>2,14</sup> This S protein has been shown to be the major inducer in the development of neutralizing antibodies.<sup>15</sup> Thus, effective convalescent plasma would contain these neutralizing antibodies. Once given to a patient, several mechanisms have been proposed as to the way in which these antibodies would treat COVID-19: direct neutralization of the virus, control of cytokine storm, complement activation and immunomodulation of a hypercoagulable state.<sup>16</sup>

The contents of this article are two-fold. First, our systematic review summarizes the available research examining the use of convalescent plasma for the treatment of patients with COVID-19. To our knowledge, this literature review is the most up-to-date evaluation that includes recently online published study designs aside from only case reports/series. Second, we describe our experience in establishing a single-center convalescent plasma donation program.

## Methods

In mid-June, PubMed, a major database, was searched using the terms "COVID-19 convalescent plasma." This elicited 110 results of which two were duplicates. The methods sections were screened with respect to study design. Study designs included were as follows: case report, case series, cross-sectional, case-control, systematic review, meta-analysis, and both single and double armed randomized clinical trials (RCT). This yielded 27 articles. Assessment of the articles was premised with the following exclusions: (1) any translational science research; (2) systematic reviews; (3) studies that were unrelated to CP as treatment for COVID-19 specifically; and



(4) case series consisting of < 5 patients. After these exclusions, seven articles were qualitatively included (Figure 1).

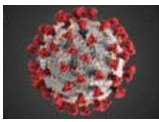
## Results

Of the seven studies included for qualitative synthesis, four were case series, one was a retrospective observational study, one was a RCT and one was a prospective cohort study.<sup>1-2,7-8,17-19</sup> Extracted details regarding sample size, patient age, time from symptom onset to CP transfusion, the amount of CP transfused, titers and patient outcomes are presented (Table 1). Combination of the seven studies encompasses a total of 5,104 patients given CP transfusion for the treatment of COVID-19.

## Discussion

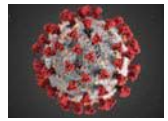
### Study Designs & Limitations

Six of the seven studies that were examined were observational, and five of these were case series (Table 1). Our search did include one RCT, however, the authors noted that their study had an early termination with a small sample size, and likely was underpowered. Early termination was due to the COVID-19 epidemic being contained in Wuhan, China, with no new cases reported for seven consecutive days after March 24, 2020.<sup>8</sup>



**Table 1:** Summary of studies utilizing CP as a treatment for COVID-19.

Study & Design	Sample size (n) & Sex	Age (years)	Time from Symptom Onset to CP transfusion (days)	Amount of CP Transfused (mL) + donor NAb titer	Patient Outcomes
<b>Shen et al.<sup>1</sup></b> <i>Case Series</i>	5 (2 female)	36-65	14-24	200-250 (2x) 400 total  1:40	- 3 patients discharged from hospital & 2 changed to stable condition; 3/5 patients weaned from mechanical ventilation within 2 weeks of treatment - ARDS resolved in 4 patients after 12d - Body temperature normalized within 3d in 4/5 patients - Viral load decreased and became negative within 12 days after transfusion - SARS-CoV-2 specific antibody & NABs increased following transfusion (range, 40-60 before and 80-329 day 7)
<b>Ye et al.<sup>2</sup></b> <i>Case Series</i>	6 (3 female)	28-75	32-49 (#5 asymptomatic)	200 (1-3x) 200-600 total  -	- All 6 patients recovered & discharged - 5 patients with chest radiologic abnormalities showed improvement of GGOs & consolidation - 3 reported symptom improvement or relief following CP - No adverse events observed during plasma transfusion & 3 days post
<b>Duan et al.<sup>7</sup></b> <i>Case Series</i>	10 (4 female)	52.5 (median) IQR, 45-59.5	16.5 (median) IQR, 11-19.3	200 (1x) 200 total  1:160	- All symptoms in the 10 patients, especially fever, cough, SOB, and chest pain disappeared or improved in 1 to 3d - 2/3 patients weaned from mechanical ventilation - All patients showed different degrees of absorption of pulmonary lesions - Lymphocytopenia improved in 7/10 patients - Baseline characteristics of patients between CP patients and a randomly selected, matched historical control group showed clinical outcomes were significantly different (P<.001) - No serious adverse reactions or safety events after CP transfusion
<b>Salazar et al.<sup>17</sup></b> <i>Case Series</i>	25 (14 female)	51 (median) IQR, 42.5-60	10 (median) IQR, 7.5-12.5	300 (1-2x) 300-600 total  -	- 76% showed improvement after 14d & 11 discharged, based on 1-point improvement scale - CRP decreased from 14.66 mg/dL at day 0 to 2.9 mg/dL and 0.45 mg/dL at days 7 & 14 post transfusion - No adverse events as a result of plasma transfusion were observed; Though 3 patients developed a VTE 4-8d after transfusion
<b>Zeng et al.<sup>18</sup></b> <i>Retrospective Observational Study</i>	19  6 treatment (1 female)  15 control (4 female)  Control: standard treatment	Treatment Group: 61.5 (median) IQR, 31.5-77.8  Control Group: 73 (median) IQR, 60-79	21.5 (median) IQR, 17.8-23  Onset of symptoms described as viral shedding	300 (median) IQR, 200-600  -	- There was no significant difference in mortality (5/6 patient in treatment group & 14/15 patients control group; P=.50) - All 5 patients in the treatment group (100%) and 3/14 of the control group (21.4%) had undetectable SARS-CoV-2 before death (P=.005) - The survival period was longer in the treatment group than in the control group (P=0.03)
<b>Li et al.<sup>8</sup></b> <i>RCT</i>	103  52 treatment (27 female)  51 control (18 female)  Control: standard treatment	70 (median) IQR, 62-78	30 (median) IQR, 20-30	4-13 mL/kg  NAb titer 1:80 ≈ S-RBD-specific IgG 1:1280	- No significant difference in time to clinical improvement within 28 days (difference, 8.8% [95% CI, -10.4% to 28.0%]; HR, 1.40 [95% CI, 0.79-2.49]; P=.26) - No significant difference in 28-day mortality (15.7% CP group vs 24.0% control; OR, 0.65 [95% CI, 0.29-1.46]; P=.30) - No significant difference in time from randomization to death (HR, 0.74 [95% CI, 0.30-1.82]; P=.52) - No significant difference in time from randomization to discharge (51.0% CP group vs 36.0% control discharged by 28d; HR, 1.61 [95% CI, 0.88-2.93]; P=.12) - At 24, 48, 72h, rates of negative SARS-CoV-2 viral PCR in CP group were all significantly higher than in control (44.7% vs 15.0%, P=.003 at 24h; 68.1 vs 32.5%, P=.001 at 48h; 87.2% vs 37.5%, P<.001 at 72h) - 2 patients with adverse events within hours of transfusion.
<b>Joyner et al.<sup>19</sup></b> <i>Prospective Cohort</i>	5,000  -	62 (median) Range, 18-97	-	200-500  -	- 81% of patients had severe or life-threatening COVID-19 and 19% were judged to have high risk of progressing to severe or life-threatening - <1% (36) of transfusions had serious adverse events reported; of these 0.3% (15) were deaths - Seven-day mortality rate was estimated to be 14.9% using the product limit estimator (95% CI, 13.8-16.0%) - The mortality rate among those admitted to ICU was 16.7% (456 of 3,316 patients in ICU) (95% CI, 15.3-18.1%) - The mortality rate of those not admitted to ICU was 11.2% (146 of 1,682 hospitalized patients) (95% CI, 9.5-12.9%)



Furthermore, the retrospective observational study notes that COVID-19 had been nearly finished outside of Wuhan when CP had finally become available.<sup>18</sup> Herein lie two opposing forces: the need for rapid containment with public measures as compared to the greater length of time and number of patients needed to establish a well-developed RCT. This is likely why there is a lack of RCTs regarding CP, though additional clinical trials are currently underway.<sup>19</sup>

### *Age and Gender*

Reported medians were all greater than 50 years of age (Table 1). These findings are consistent with the epidemiologic data published indicating that younger people are less likely to be affected.<sup>6,20-21</sup> Of note, the CP patients in all studies were critically, severely or life-threateningly ill due to COVID-19. Increased age is associated with increased comorbidities which may worsen prognosis. In our review, of the studies that reported gender, 43.5% of patients were female (Table 1). It is unclear in these studies whether or not there was a significant difference in outcome with respect to gender. Yet, a study of 32,583 confirmed COVID-19 cases in China revealed that females had a higher rate of confirmed cases than males. But, that critically ill patients were more likely to be male and the crude fatality rate was higher among men (2.8% vs 1.7%).<sup>6</sup>

### *Time from Symptom Onset*

All four case series showed improvement in symptoms despite differing amounts of time between symptom onset and the first transfusion of CP. Three had a median between 10-20 days while one case series transfused all six of their patients after 30 days. All reported positive outcomes in symptom improvement or recovery (Table 1). The study by Zeng et al. depicted that while CP treatment contributed to the discontinuation of SARS-CoV-2 shedding and longer survival in patients with COVID-19, it did not reduce mortality in critically ill patients with end stage COVID-19.<sup>18</sup> The median time from viral shedding to CP transfusion in this study was 21.5 days. For SARS-CoV-1, viremia typically peaks in the first week after infection and patients

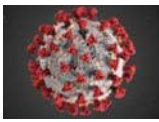
build their immune response by day 10-14. It was also found that for SARS-CoV-1, a higher day-22 discharge rate was observed in patients given CP before day 14 of illness (58.3% vs 15.6%;  $P < .001$ ).<sup>22</sup> In essence, CP may be most effective if given earlier in the disease which could be why the Zeng et al. study did not show a reduction in mortality. Furthermore, in the RCT by Li et al., CP was given at least 14 days after disease onset. This study also showed no significant difference in 28-day mortality but did show significant antiviral activity.<sup>8</sup> Further studies are needed to determine the timing in which CP should be administered for SARS-CoV-2, especially with respect to mortality.

### *Amount of CP Transfused*

The amount of CP transfused to COVID-19 patients ranged from a total of 200 – 600 mL. This was typically at doses of 200-300 mL given one to three times (Table 1). Interestingly, Li et al. was the only study to give a plasma dosage based on patient weight.<sup>8</sup> Weight-based dosing would make more sense in that it would be a better mechanism in ensuring that patients are given at least the minimal dose of neutralizing antibodies. The variability of amount of CP across studies further adds to the degree of incoherence in being able to define and develop an accurate protocol for its use.

### *Patient Outcomes*

All case series showed improvement in clinical outcomes and symptoms after CP ( $n=46$ ). They also reported no adverse events. Zeng et al. showed that there was no significant difference in mortality but that the survival period was longer in the treatment group than in the control group ( $P=0.03$ ).<sup>18</sup> Li et al. revealed that the rate of viral shedding for CP patients was significantly different than in control patients (44.7% vs 15.0%,  $P=.003$  at 24h; 68.1 vs 32.5%,  $P=.001$  at 48h; 87.2% vs 37.5%,  $P<.001$  at 72h).<sup>8</sup> Though, mortality and clinical improvement revealed no significant difference between groups. Joyner et al. revealed that the seven-day mortality for 5,000 patients was found to be 14.9% (95% CI, 13.8-16.0%) and that <1% of transfusions had serious adverse events reported.<sup>19</sup> Overall, there is evidence that CP for COVID-19 may improve clinical symptoms



and viral shedding. More research needs to be done on mortality especially in that for patients with end stage COVID-19, CP may be unable to avert a poor outcome.<sup>18</sup>

### *Antibody Titers of Donors*

Not every study reported the measured antibody titers for donor plasma (Table 1). Li et al. found that levels of 1:1280 S-RBD-specific IgG positively correlated with a titer of 1:80 for neutralizing antibodies ( $r=0.622$ ,  $P=0.03$ ).<sup>8</sup> Shen et al. used a NAb titer of  $> 40$  and Duan et al. used a NAb titer of  $> 1:160$ .<sup>2,7</sup> The measurement of specific neutralizing antibodies is preferential over singularly measuring SARS-CoV-2 antibodies. This is because neutralizing antibodies are the actual antibodies involved in neutralizing the virus, so it is imperative that plasma contain these.<sup>23</sup> The specific level of NAb that both donors and transfused patients should have remains unclear.

### *Review of Donor Process*

On March 24, 2020, in major news, the United States Food and Drug Administration (FDA) announced that they would facilitate access to convalescent plasma for the treatment of COVID-19.<sup>24</sup> The three main pathways by which clinicians can access COVID-19 convalescent plasma (CCP) are summarized below:<sup>25</sup>

1. Clinical Trials – Through the Investigational New Drug (IND) regulatory pathway, investigators wishing to study CCP would submit requests to the FDA. This would allow them to participate in clinical trials for CCP.
2. Expanded Access Program (EAP) – The EAP allowed institutions to register themselves under Mayo Clinic's Institutional Review Boards (IRB). Here they expanded access for institutions to give CP to those with severe or life-threatening COVID-19, or those at high risk of progression to severe or life-threatening disease. They also provided standardized guidelines regarding the donor eligibility process and patient infusion procedures.
3. Single Patient Emergency IND (eIND) – Also referred to as “compassionate use,” this pathway allows clinicians to administer CCP to their patients with serious or immediately life-threatening infection. This pathway is particularly important for those patients or areas who may not have access to participate in either a clinical trial or the EAP.

## **University of Missouri Establishes COVID-19 Convalescent Plasma Program**

In early April 2020 the University of Missouri-Columbia enrolled in the EAP and within a span of weeks, we implemented a COVID-19 convalescent plasma program. The aim of this section is to summarize our establishment process as well as provide context with respect to the challenges or successes we faced.

### *Community Engagement & Recruitment*

The recruitment of donors for the COVID-19 convalescent plasma program involved multiple approaches. Primarily, the creation of a webpage within the healthcare system website, described the donation process and the eligibility requirements (<https://www.muhealth.org/conditions-treatments/coronavirus/plasma>). Most importantly, this webpage included the donor form by which community members could submit a brief interest form with their information. This step was crucial as it provided a singular mechanism by which volunteers could relay their contact information for further screening. Another CCP program at New York Blood Center enterprises (NYBCe) created a similar webpage and submission form.<sup>26</sup> Other forms of media, including local news and broadcasting stations, were utilized in efforts to increase community awareness of the CCP Program. Furthermore, news spread via word of mouth either from clinicians or from patients and donors themselves. A method to increase our donor pool which we did not utilize, was actively seeking out COVID-19 positive lists from public health agencies. However, this method could potentially pose an ethical dilemma regarding privacy.

### *Screening*

Forty-nine individuals in and around the community were referred to us. Of these, forty-four completed the donor form from the health system website. Five were referred via word of mouth. All forty-nine individuals were then contacted within 72 hours via phone call from a health professional to be asked a list of screening questions. Individuals were asked to confirm their contact information, whether or not they had had a positive COVID-19 laboratory test, the first day in which they experienced symptom recovery, if they had had a follow-up negative COVID-19 laboratory test, their willingness



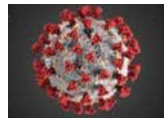


Table 2. Donor Information

A: Demographics of Approved Donors										
	A+	A-	B+	B-	AB+	AB-	O+	O-	Unknown	Total
Female	4	0	0	0	0	0	2	1	6	13
Male	2	1	1	0	2	0	1	0	6	13
<b>Total</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>12</b>	<b>26</b>

B: Reasons for Disqualification of Potential Donors	
Negative COVID-19 serology test	10
Never exhibited symptoms	2
Aspirin Intake in the last 48 hours	3
Intake of Blood Thinners	0
Recent blood donation or transfusion	1
Travel history	1
Lost Communication	4
Pregnancy	1
<b>Total</b>	<b>22</b>

to get retested, and their blood type. Other standard plasma donation screening questions were also asked. Having numerous screening questions in our CCP program seemed necessary to us so as to not overwhelm donation centers. By adding this additional step, we further eliminated the burden that blood collection centers could face.<sup>27</sup>

### Qualification

Donors had to meet the following requirements as specified by the American Red Cross (ARC):<sup>28</sup>

1. A confirmatory COVID-19 laboratory test either through nasopharyngeal RT-PCR or antibody serology of IgG anti-SARS-CoV-2
2. Symptom relief of at least 14 days with a negative RT-PCR test after 14 days or symptom relief of greater than 28 days

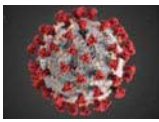
Our area had, at first, faced a delay in the availability of testing to community members. For those individuals who had had COVID-19-like symptoms, but had not been tested due to a lack of previously available testing, serology tests were ordered. However, those who needed serology tests were delayed two weeks because such a test had not yet been available. This hindered the quickness and ability to test eight individuals. Those who did not meet the aforementioned requirements were deferred.

Over roughly two months, 26 individuals met screening requirements and were referred to the ARC

website (53%). Of the qualified donors, the most common self-indicated blood type was A+ (23%), however most did not know their blood type (46%) (Table 2). There were equal amounts of individuals who were male and female and there were no transgender volunteers. Twenty-eight individuals (47%) did not meet qualification guidelines for a variety of listed reasons (Table 2). Noticeably, 45% of those who did not qualify, were disqualified due to a negative COVID-19 serology test. Interestingly, when these volunteers were notified of their negative serology test results, many displayed some level of frustration in the result. It is unclear as to why this may be.

### American Red Cross Partnership

The blood collection center utilized was the American Red Cross. Early on, their partnership with the FDA in being a major blood collection service allowed for a national, cohesive effort.<sup>25</sup> In phone call surveys of the 26 who had been referred to the ARC, only six individuals said that they had already donated plasma. The overall success rate of persons donating for our CCP program so far is 12% (6/49). At first the ARC was asking clinicians to submit paper forms indicating the donor's qualifications as well as to provide physical documentation of test results. This policy quickly changed which made it easier to refer donors through the ARC's COVID-19 webpage, with



no documentation as proof. However, it has not been communicated back to us when one of our donors made an appointment, donated, or if they have neutralizing antibodies or not.

## Conclusion

The rapid establishment of a COVID-19 convalescent plasma program proved to be successful. The coordinated efforts of government agencies, research institutions and blood donation services on a national level was instrumental. This allowed for easier access to plasma as well as regulated the guidelines for its distribution and use. Through these guidelines, our institution was able to direct and screen volunteers as potential donors. While this coordinated, national effort synchronized plasma donation programs, much of the local follow-through of donors was lost after an individual was referred for blood donation. However, national coordination will likely be imperative for any future need of convalescent plasma.

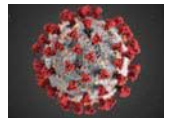
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## Disclosure

None reported.

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# Lessons from Contact Tracing in Mid-Missouri

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**Controlling the spread of COVID-19 is extremely labor intensive and requires funding, active community and health care provider engagement, and public recognition and acceptance of the importance of quarantine and isolation.**



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## Abstract

**The public health community has used contact tracing to address pandemics since the eighteenth century. With the emergence of COVID-19, these classical skills are the primary defense for communities to limit morbidity and mortality during the pandemic. Here we describe the methods, strengths, and challenges of contact tracing.**

## Introduction

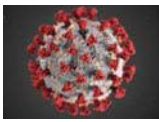
On December 31, 2019, the World Health Organization (WHO) was notified of an emerging pneumonia-like illness of unknown etiology within the city of Wuhan, China.<sup>1</sup> Identification of SARS-CoV-2 as the causative agent of this illness, termed COVID-19, followed soon after the outbreak. Despite the rapid development of an international crisis management team, a global preparedness plan to increase production and distribution of personal protective equipment (PPE), and extensive travel restrictions, COVID-19 rapidly spread across the world, leaving twin public health and economic crises in its wake.

COVID-19 has placed an incredible amount of stress upon the public health, research, and biomedical communities. Despite both science and medicine advancing at an unprecedented pace much remains unknown about

this virus. This year COVID-19 migrated from the northeast, to the Sun Belt, and now has set solidly into the midwest. In Missouri the prevalence was low until mid-summer, but now we face a dramatic increase in cases, especially among younger people. With no natural immunity, and with widespread vaccinations and herd immunity in its earliest stages, case burden will likely continue to increase. Public health officials also anticipate sustained community transmission of COVID-19 this winter and spring, especially as adherence to public health recommendations wanes amid “caution fatigue.” As with the 1918 Spanish flu pandemic, we have primarily relied on nonpharmaceutical interventions to limit the spread of this novel coronavirus, including social and physical distancing, an emphasis on handwashing, situational awareness, and contact tracing with both isolation of COVID-19 positive patients and quarantine of their close contacts.

## What is Contact Tracing? Why Does It Matter?

Soon after COVID-19 emerged, the WHO recommended public health agencies engage in contact tracing and quarantining of exposed individuals to slow the progression of the virus. Public health professionals use contact tracing as a means to follow and establish control of



outbreaks. This practice was first developed by John Haygarth to prevent the spread of smallpox during the eighteenth century.<sup>2-4</sup> Since its inception, public health officials have utilized contact tracing for infection control during nearly every major epidemic and pandemic, including STIs, HIV/AIDS, tuberculosis, and smallpox. In 2020, contact tracing has been critical for effectively isolating and limiting the spread of COVID-19 in many countries.

There are three major components of contact tracing:<sup>2,5</sup>

1. Identification of a primary case through symptoms, subsequent testing, and mandatory reporting to the health department. The primary case is considered a “person under investigation” (PUI) and needs to be isolated throughout the infectious period.
2. Outreach to any individuals that the PUI came in close contact with, during the predicted infectious period of the illness.
3. Quarantine of these contacts with monitoring for symptom development over the incubation period of the disease.

If the contact tests positive, that individual becomes a new primary case, and contact tracers repeat the process for the subsequent case. When adequately staffed, this system efficiently prevents the spread of disease by limiting contact between exposed and non-exposed individuals. Contact tracing is a well-vetted technique that has effectively limited the spread of COVID-19 in countries such as Taiwan, South Korea, and New Zealand, even in the absence of a vaccine; those countries have enjoyed widespread public support of strong public health measures to combat COVID-19, partly because of their unfortunate experiences with the 2002-2004 SARS and 2012 MERS outbreaks.

### **Effectively Using Contact Tracing to Limit Community Transmission of COVID-19**

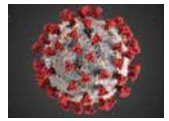
Contact tracing has become a household catchphrase during the pandemic. However, many people still have questions about what is considered a “close contact.” The CDC recommends contact tracing to identify close contacts of an individual with a laboratory-confirmed or suspected COVID-19 infection. These guidelines further define a “close contact” as any individual within six feet of a PUI for at least 15 minutes in a 24-hour period during the time that the PUI was infectious. From a public health

perspective, this infectious period starts two days before the onset of symptoms (or two days before a positive test, if the PUI is asymptomatic) and ends once the PUI enters isolation.<sup>5-6</sup>

There have also been conflicting recommendations regarding testing procedures for close contacts. As of August 31, 2020, the CDC has recommended that in jurisdictions with testing capacity, symptomatic, and asymptomatic close contacts to patients with confirmed and probable COVID-19 should be evaluated and monitored. Implementation of this recommendation is often dependent on availability of local resources, especially with different testing modalities now available (including PCR, antigen testing and at-home testing, each of which have different test performance characteristics).

Quarantine and isolation are two other terms that are sometimes misunderstood or used interchangeably but mean different things. Quarantine is recommended for exposed contacts, while isolation is to prevent spread from confirmed cases. CDC has recommended that close contacts to confirmed or suspected COVID-19 cases self-quarantine for a full 14 days after the last potential exposure to the PUI. In some cases, such as for asymptomatic individuals, quarantine duration may be reduced to 10 days, or seven days following a negative COVID-19 test; however, ending quarantine early requires close symptom-monitoring, mask-wearing at all times around others, and avoiding contact with high-risk individuals for the full 14 days.<sup>7</sup> The most precautionous approach is still full quarantine for 14 days. Any close contact who develops symptoms of COVID-19 should isolate immediately and get tested. Any close contact who tests positive for COVID-19, whether asymptomatic or symptomatic, should then be managed as a primary case and isolate for 10 days minimum.

Interviewing COVID-19 cases and contact tracing is extremely labor-intensive for local health departments. Since the arrival of COVID-19, local health department employees and volunteers have worked diligently to keep up with case investigations and contact tracing protocols to limit viral spread within their communities.<sup>8</sup> In Boone County, Missouri, the goal of the Columbia-Boone County Department of Public Health and Human Services (PHHS) has been for a staff member to interview every PUI within 48 hours to gather CDC-required case information. The staff member instructs the PUI on isolation procedures and gathers the names of all identifiable close contacts. PHHS contact tracers



then notify these individuals that they have been identified as close contacts to a case of COVID-19, and they are instructed to quarantine for 14 days from the time of their last exposure. Guidelines for quarantining and symptoms of COVID-19 are reviewed with each contact. Recently, PHHS announced that they need to curtail contact tracing due to the overwhelming burden of cases and are now providing detailed guidelines to instruct cases to manage their own close contact notifications.<sup>9</sup>

PHHS also specifically recommends that close contacts wait until at least five days post-exposure before undergoing COVID-19 testing. This recommendation was partly based on local availability of PPE and testing, as well as on studies that suggest that false negative rates drop substantially five to nine days after exposure.<sup>10</sup> Testing too early consumes limited testing resources, and risks giving individuals a false sense of security (when they get a negative result while still presymptomatic).

For PUIs in isolation, the timing is different. Individuals who test positive are instructed to isolate until they meet the criteria for being non-infectious (ten days after testing positive for asymptomatic individuals; ten days after symptom onset for symptomatic individuals, provided that symptoms have improved and the individual is afebrile for 24 hours without the use of antipyretics).<sup>11</sup> If a previously asymptomatic patient becomes symptomatic, the clock “restarts” for the ten days of isolation, based on date of symptom onset.

### Pitfalls of Contact Tracing

When colleges and universities opened this fall, thousands of students returned to college towns from around the nation and even abroad, predictably increasing the risk of exposure to local communities. Contact tracing has been focused on preventing campus transmission from spreading to high-risk populations and congregate living conditions (such as nursing homes or prisons). However, campus-based contact tracing becomes very challenging if students gather in large social groups and are unable to identify close contacts. Following an early surge in cases, our policies, contact tracing and isolation and quarantine protocols successfully maintained a flattened curve throughout the 2020 Fall Semester.<sup>12</sup>

Local communities also face increased risks in grade schools and daycare facilities. There is a necessary balance between the educational imperatives of in-person schooling (including socialization and educational needs of our children) and the public health

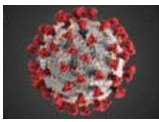
interest of minimizing the spread of communicable diseases. The optimal balance for each community requires careful weighing of risks and benefits.

A rapid increase in cases can overwhelm a community’s ability to conduct effective contact tracing in a timely manner; lags in notifications and subsequent delays in quarantine of contacts may also result in additional spread. In Boone County, as of January 8, 2021, we have more than 19,000 cases (869 active, 29 hospitalized, 60 deaths), with a total of 108 hospitalized COVID-positive patients in our three hospital systems, because of patients from our neighboring counties. Our positivity rate has increased dramatically, from 2-3% in early June, to over 30% since Thanksgiving.<sup>6,8,13</sup> In Boone County, PHHS and the University of Missouri (MU) have tried to ensure that we have adequate resources to effectively respond to increased cases. As of the date of this submission, MU remains able to maintain standard case investigation and contact tracing, while PHHS is now overwhelmed and will rely on cases to manage their own contacts. While this is suboptimal, it is occurring nationally amid the predictable surge in cases this winter. Contact tracing involves many questions and considerations of various scenarios from cases and contacts alike. Health care providers need to be prepared to respond, stay up-to-date with the latest guidelines, and coordinate with county health departments as much as possible.

With the rising number of cases nationally, individuals often see their physicians before being contacted by local health departments. Under these circumstances, providers should inform patients that the health department will contact them with specific recommendations. Meanwhile, the major messages for newly-positive COVID-19 patients are (1) go to the emergency department for any severe symptoms, (2) isolate (i.e. do not share bathrooms or contact surfaces; have someone bring you food if you are in a household with others; do not travel anywhere, including to the grocery store) for at least 10 days after symptom onset (or after a positive test), and (3) list and notify close contacts, defined as those who have been within six feet of a COVID-positive patient for at least 15 minutes during their infectious period (starting two days prior to symptom onset, or two days prior to testing positive if asymptomatic).

### Concerns with Contact Tracing Efforts in Relation to Reopening of Schools and Universities in Spring 2021

Emphasizing the role of young people in spreading COVID-19 has also led to unfortunate and inappropriate



stigma. We are now in a time of widespread community transmission, and half of COVID-positive patients are uncertain how they acquired the virus.

Stigmatization may result in students and young adults resisting testing or minimizing symptoms to themselves and others. Local authorities need to maintain a caring attitude with students and young adults, while also maintaining a consistent message and clear boundaries for social distancing and masking.

Respecting privacy is another critical concern. Resistance to reporting symptoms can result in missing and inaccurate data, as well as missed opportunities to prevent transmission. In some areas, phone applications have decreased the human resource burden and inaccuracy of contact tracing. Such applications track potential exposure and automatically notify individuals at risk; while these applications show some promise, there are concerns about privacy and effective implementation of such technologies.<sup>13-17</sup>

## Conclusion

This pandemic has led to unprecedented challenges for our often-neglected public health system. While health departments across the nation have committed thousands of person-hours to PUI investigations and contact tracing, many are overwhelmed by the current rise in cases. Controlling the spread of COVID-19 is extremely labor intensive and requires funding, active community and health care provider engagement, and public recognition and acceptance of the importance of quarantine and isolation. Without these elements, the morbidity and mortality rates for COVID-19 will continue to rise.

Frequently-evolving guidelines are also a challenge to communicate, especially when patients, friends, and family members come to us for answers. As we all grapple with caution fatigue and COVID fatigue, it is incumbent on all of us to follow public health recommendations including the avoidance of large gatherings, regular hand-washing, and maintaining at least six feet of distance from everyone outside of our households, whether or not we are wearing a mask. Nonpharmaceutical interventions, including good cough and hand hygiene, staying home while sick, social and physical distancing, mask-wearing in public, and contact tracing with isolation of positive patients and quarantine of close contacts is still our best bet until we have widespread availability and acceptance of effective vaccines.

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## Disclosure

None reported.

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