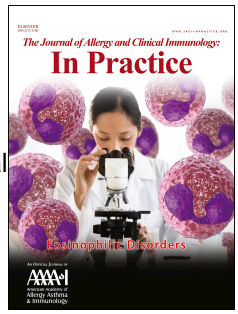

Clinician Wellness During the COVID-19 Pandemic: Extraordinary Times and Unusual Challenges for the Allergist/Immunologist

Priya Bansal, MD, Theresa A. Bingemann, MD, Matthew Greenhawt, MD, MBA, MSc, Giselle Mosnaim, MD, MS, Anil Nanda, MD, John Oppenheimer, MD, Hemant Sharma, MD, David Stukus, MD, Marcus Shaker, MD, MSc

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Priya Bansal, MD[1]; Theresa A. Bingemann, MD[2]: Matthew Greenhawt, MD, MBA, MSc[3]; Giselle Mosnaim MD, MS[4]; Anil Nanda, MD[5,6] ; John Oppenheimer, MD[7]; Hemant Sharma, MD[8]; David Stukus, MD[9]; Marcus Shaker, MD, MSc[10]

[1]Asthma and Allergy Wellness Center, St. Charles, IL. No disclosures

[2]University of Rochester Division of Allergy, Immunology and Rheumatology, Rochester, NY

[3]Section of Allergy/Immunology, Children's Hospital Colorado, Department of Pediatrics, University of Colorado School of Medicine

[4]Division of Pulmonary, Allergy and Critical Care, Department of Medicine, NorthShore University HealthSystem, Evanston, Illinois.

[5]Asthma and Allergy Center, Lewisville and Flower Mound, Texas

[6]Division of Allergy and Immunology, University of Texas Southwestern Medical Center, Dallas, Texas. No disclosures.

[7]UMDMJ Rutgers University School of Medicine. Parameters.

[8]Children's National Hospital, George Washington University School of Medicine and Health Sciences, Washington, DC.

[9]Nationwide Children's Hospital, THE Ohio State University School of Medicine, Columbus, OH

[10]Geisel School of Medicine and Dartmouth-Hitchcock Medical Center, Lebanon NH.

Corresponding Author:
Marcus Shaker, MD, MSc
Associate Professor of Pediatrics; Associate Professor of Pediatrics, Medicine, and of Community and Family Medicine
Dartmouth-Hitchcock Medical Center, Section of Allergy and Immunology
Dartmouth Geisel School of Medicine
1 Medical Center Dr.
Lebanon, NH 03756
Phone (603) 653-9885 Fax (603) 650-0907

Abbreviations: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2); coronavirus disease 2019 (COVID-19); World Health Organization (WHO); case fatality rate (CFR); Centers for Disease Control and Prevention (CDC); personal protective equipment (PPE);

intensive care unit (ICU); emergency department (ED); American Academy of Allergy Asthma and Immunology (AAAAI); American College of Allergy Asthma and Immunology (ACAAI); Canadian Society of Allergy and Clinical Immunology (CSACI); American Medical Association (AMA); tuberculosis (TB); Strength-Focused and Meaning-Oriented Approach to Resilience and Transformation (SMART)

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P. Bansal has served on the advisory boards for Genentech, Regeneron, Kaleo, AstraZeneca, ALK, Shire, Takeda, Pharming, CSL Behring, and Teva; has served as a speaker for AstraZeneca, Regeneron, ALK, Takeda, Shire, CSL Behring, Takeda, and Pharming; and has served as an independent consultant for ALK, AstraZeneca, and Exhale. M. Greenhawt is supported by grant #5K08HS024599-02 from the Agency for Healthcare Research and Quality; is an expert panel and coordinating committee member of the NIAID-sponsored Guidelines for Peanut Allergy Prevention; has served as a consultant for the Canadian Transportation Agency, Thermo Fisher, Intrommune, and Aimmune Therapeutics; is a member of physician/medical advisory boards for Aimmune Therapeutics, DBV Technologies, Sanofi/Genzyme, Genentech, Glaxo Smith Kline, Merck, Nutricia, Kaleo Pharmaceutical, Nestle, Acquestive, Allergy Therapeutics, Allergenis, Aravax, and Monsanto; is a member of the scientific advisory council for the National Peanut Board; has received honorarium for lectures from Thermo Fisher, Aimmune Therapeutics, DBV Technologies, Before Brands, multiple state allergy societies, the American College of Allergy Asthma and Immunology, the European Academy of Allergy and Clinical Immunology; is an associate editor for the Annals of Allergy, Asthma, and Immunology; and is a member of the Joint Taskforce on Allergy Practice Parameters. G. Mosnaim has received research grant support from AstraZeneca and GlaxoSmithKline; currently receives research grant support from Propeller Health; owned stock in Electrocore; and served as a consultant and/or member of a scientific advisory board for GlaxoSmithKline, Sanofi-Regeneron, Teva, Novartis, AstraZeneca, Boehringer Ingelheim and Propeller Health. J. Oppenheimer has served as a consultant for AstraZeneca, GlaxoSmithKline, Sanofi, and Novartis; is a consultant for GlaxoSmithKline, AstraZeneca, and Sanofi; is Associate Editor for Annals of Allergy Asthma Immunology and AllergyWatch; is Section Editor of Current Opinion of Allergy; receives royalties from Up to Date; is Board Liaison ABIM for ABAI; is a member of the Joint Taskforce on Allergy Practice Parameters. D. Stukus is a consultant for DBV Therapeutics, Before Brands, and Abbott Nutrition. M. Shaker has a brother who is CEO of Altrix Medical; is a member of the Joint Task force on Practice Parameters; and serves on the editorial boards of the Journal of Allergy and Clinical Immunology: *In Practice*, Annals of Allergy, Asthma, and Immunology, and the Journal of Food Allergy. The other authors declare they have no relevant conflicts of interest.

Abstract: The global spread of COVID-19 has caused sudden and dramatic societal changes. The allergy/immunology community has quickly responded by mobilizing practice adjustments and embracing new paradigms of care to protect patients and staff from SARS-CoV-2 exposure. Social distancing is key to slowing contagion but adds to complexity of care and increases isolation and anxiety. Uncertainty exists across a new COVID-19 reality and clinician wellbeing may be an underappreciated priority. Wellness incorporates mental, physical and spiritual health to protect against burnout, which impairs both coping and caregiving abilities. Understanding the stressors that COVID-19 is placing on clinicians can assist in recognizing what is needed to return to a point of wellness. Clinicians can leverage easily accessible tools, including the Strength-Focused and Meaning-Oriented Approach to Resilience and Transformation (SMART) approach, wellness apps, mindfulness, and gratitude. Realizing early warning signs of anxiety, depression, substance abuse, and post-traumatic stress disorder is important to access safe and confidential resources. Implementing wellness strategies can improve flexibility, resilience, and outlook. Historical parallels demonstrate that perseverance is as inevitable as pandemics and that we need not navigate this unprecedented time alone.

Keywords: wellness; physician wellness; SARS-CoV-2; COVID-19; pandemic; social distancing; burnout; depression; grief; mindfulness

INTRODUCTION

Despite global awareness of SARS-CoV-2 since December 2019, COVID-19 has become a global pandemic which caught the world unprepared in the early months of 2020.(1) It is now clear SARS-CoV-2 is highly contagious, capable of causing severe pneumonia, acute respiratory distress syndrome, and death, particularly in vulnerable populations such as older adults and those with chronic medical conditions, such as cardiovascular disease, diabetes, respiratory disease, hypertension, and malignancy.(2, 3) Strategies are being implemented to "flatten the curve" of the pandemic to preserve capacity and not outpace the availability of precious healthcare resources. The current supply of personal protective equipment (PPE), intensive care unit (ICU) beds, and ventilators may not be able to keep up with projected demands.(2, 4) This nightmare scenario has been experienced internationally, with countries such as Italy and Spain overwhelmed, and looming concerns that this may occur in certain parts of the US.(5) For example, the percentage of symptomatic patients with COVID-19 requiring ICU care has been between 9-11%(6) Demonstrating the rapidity of spread, the first recognized case of the pandemic in Italy appears to have been a young man admitted in the Lombardy region with atypical pneumonia on February 20, 2020 and healthcare resources were overwhelmed within a few weeks.(5) The timeline of the Italian experience illustrates a major reason for COVID-19 induced anxiety around the world. (Figure 1)(5)

Attempts to mitigate the impact of COVID-19 have disrupted core aspects of society. Social distancing is central to efforts to control the pandemic.(4) However, to be effective, social distancing must be rapidly and universally adopted across a society, which sadly has occurred to varying degrees across the globe. Risk perception is likely a significant lever on the degree to which populations embrace a social distancing approach.(7)

During a pandemic, both medical experts and governmental authorities require a high degree of accurate knowledge and trust to execute effective policies.(8) Tragically, there has been a vacuum of unified societal knowledge and trust throughout this pandemic. For example, a recent cross-sectional survey of the general public in the United States (US) and United Kingdom (UK) found that, of 2,986 US and 2,988 UK adults, 23.9% and 18.4% respectively believed SARS-CoV-2 to be a bioterrorist weapon.(8) When asked between February 23 and March 2, 2020, 61% of US and 72% of UK respondents thought the number of people who would die of COVID-19 in their respective country would be less than 500 persons.(8)

In response to the medical community, local government, and concerned citizen frustrations with currently available policies and demands for detailed accurate information, our knowledge of COVID-19 is rapidly expanding.(9) Unfortunately, the spread of the virus also continues to rapidly increase, with the Johns Hopkins Coronavirus Resource Center listing 607,965 total confirmed cases and 28,124 deaths as of March 27, 2020.(10) The case fatality rate (CFR) of COVID-19 is being scrutinized.(11) Early data from China estimated the CFR to be 2.3% of symptomatic patients presenting for medical evaluation with rates as high as 15% in vulnerable elderly populations.(3, 4) In patients with critical illness, CFR has been reported to be as high as 49%.(3) While CFR rates may actually be much lower when mild and asymptomatic cases are considered, the Italian CFR rate is 7.2%.(5) (Figure 1). Much of this data is hindered by lack of knowledge regarding the total number of cases. Healthcare worker fatalities were noted early and continue to rise in the United States.(3, 4) In an early report from China, 3.8% of cases occurred in healthcare workers, 14.8% of these were classified as severe, with a CFR of 0.3%.(3, 4) In Italy, more than 50 physicians have died of COVID-19 as of March 27, 2020.(12)

Despite this rising tide of illness, there is room for hope. While the pace of change demanded in our response to COVID-19 is disorienting, it is important to note that, globally,

145,625 patients with confirmed cases have recovered as of March 29, 2020.(10) There is a growing awareness of the need to protect healthcare workers from SARS-CoV-2 infection.(13) However, in addition to an urgent need to prevent infections related to patient care, there is also a growing need to address broader aspects of wellness among healthcare workers.

The COVID-19 pandemic has created sudden stressors across many domains of our lives that become apparent when viewed through different lenses, including the theory of knowledge ("you don't know what you don't know", information vs misinformation), appreciation of system capacity (both health and economic), understanding warranted and unwarranted variation, and human psychology.(14) To survive COVID-19 and its aftermath requires care directed toward our patients as well as ourselves and our families. While tending to personal wellness is always important, it has become even more crucial during these extraordinary times. Understanding risks and consequences of burnout magnified by COVID-19; identifying historical parallels of the pandemic while appreciating new challenges of social media; leveraging new technologies to care for patients, staff, colleagues, and ourselves while managing responsibilities at home; and utilizing wellness resources at the AAAAI, ACAAI, CSACI, and state physician health programs as needed can help each of us navigate uncharted waters together, even while practicing social distancing.

CLINICIAN WELLNESS

Clinician wellness involves a number of factors including stress and burnout.(15) These factors can impact negatively on patient care and lead to increased medical errors, malpractice risk, and early retirement.(15). Greater clinician stress may lead to higher rates of drug and alcohol addiction, divorce, and suicide.(15) Clinicians are more likely to have burnout symptoms than the general US workforce and are more likely to be dissatisfied with work-life balance.(16)

Even before this pandemic, burnout rates among US physicians overall were estimated around 46%.(16) Female physicians have higher rates of burnout.(17) A recent survey revealed a burnout rate of 35% among US allergy and immunology physicians in the US.(18)

Higher rates of burnout may be associated with certain clinician attributes, including belief in service and sense of duty, perfectionism, and personal internalization of patient outcomes.(19) Day-to-day office-based stressors include clerical burden (e.g. electronic medical record documentation), excessive non-clinical and clinical workloads, and practice inefficiencies.(15, 20) While medical practice demands may contribute to burnout most significantly, personal and family stressors may add additional pressures.(15) The current COVID-19 pandemic has disrupted the healthcare system worldwide. A prolonged response to the pandemic will lead to additional stress for clinicians and their support staff and further permeate throughout the healthcare system.(21) Consequences of burnout are shown in Figure 2.

COVID-19 CHALLENGES TO WELLNESS

In the setting of a global pandemic it is normal to be frightened for one's own personal safety (and potential mortality), particularly with data emerging about airborne and fomite transmission, exposure risk from asymptomatic carriers, limited testing, and well-publicized issues regarding conflicting advice about what level of personal protective equipment (PPE) is necessary or available. Finding evidenced-based PPE recommendations is difficult; however, over a 2 week span, the CDC downgraded the COVID-19 risk from airborne to droplet (outside of an aerosol generating procedure).(2) Changing recommendations have been a cause of anxiety for clinicians, compounded by employment termination concerns in some instances for wearing precautionary PPE.

In a crisis, physicians may feel their medical oaths tested when confronted with ethical dilemmas which are intrinsic in rationed care due to equipment shortage or institutional policy of universal DNR status for COVID-19 positive patients. As the psychological stressors are evolving day by day, non-ICU/ED physicians may be re-deployed to less familiar (and critical) clinical areas. Questions regarding the ethics of providing care outside of one's scope of practice, and the associated liability, are evolving. The AMA released an update to their code of medical ethics on March 20, 2020, specifically addressing these issues in Opinion 8.3 and Opinions 11.1.2 and 11.1.3.(22) These may help provide an ethical backdrop on how to approach such situations, though this still may not do much to leverage preserving one's own wellness and ability to persevere in such circumstances. In New York state, Governor Cuomo has introduced legislation limiting any malpractice liability to physicians practicing outside of their scope, except in cases of gross negligence (which remains nebulously defined).(23) However, outside of New York, such liability protection is unclear and may cause justifiable concern.

Many hospitals and healthcare systems are recognizing the stress and strain on their clinicians. Some have made counselors available and have been offering free access to online tools for meditation and relaxation. A plethora of such online tools exist, and sometimes a quick breather may serve as a way to recharge and regain some wellness, at least momentarily, when under stress. Multiple businesses have recognized the heroic efforts of the medical community and are offering free services—sometimes just a free coffee and donut may be enough to show that one's efforts are being appreciated. The real concern is that in stressful times, there is a temptation to self-medicate or resort to less productive and more self-harmful solutions—drugs and alcohol in particular, which may increase the risk for suicide and domestic violence. Physicians at baseline work high-stress jobs and are already prone towards issues,

including marital problems, and substance abuse, that may become magnified in this particular crisis.

CHANGE, LOSS, GUILT, AND GRIEVING

Change is difficult, and during COVID-19 change has been rapid and associated with both uncertainty and with varying degrees of loss. Guilt and grieving are also major considerations for our wellness. Elizabeth Kubler Ross defined 5 stages of grieving: denial, anger, bargaining, sadness, and acceptance.(24) More recently, these stages have been updated to disbelief, yearning, anger, depression, and acceptance, with the depression peaking at approximately 6 months post-loss, and acceptance not until 24 months post-loss.(25) (Figure 3) Some of these stages may be more identifiable, though loss in the midst of this crisis may be harder to define, and may vary considerably based on personal experiences. When the disease was abroad, there may have been denial/disbelief as to the severity and yearning for limited effects on our society. As testing kits and PPE have been deficient, anger at the government and administration is being felt. Physicians may find themselves bargaining for any way out as they are called to make life or death decisions.

Undoubtedly, how we practice allergy has already changed, and in addition to health risks physicians face the looming reality of economic loss and associated anxiety. As COVID-19 becomes pervasive around us, there is a need to appreciate the potential for our own countertransference in considering our own personal and familial needs vs. the needs of our patients and colleagues. This may be more difficult for some than others. Naturally, we will all likely experience some degree of guilt and grieving for a number of potential reasons. However, as we may all cycle through these aforementioned stages, there is the final stage of acceptance as

we find our way forward. Remind yourself this is a normal, healthy part of wellness, and things will hopefully change for the better.

A HISTORICAL PERSPECTIVE

Historically, one can draw an analogy to tuberculosis (TB). In the 19th century, tuberculosis was responsible for one in seven deaths. Like COVID-19, TB mortality also significantly impacted physicians. It was not until 1882 that Dr. Edward L. Trudeau discovered the tuberculosis bacterium that caused the disease, and in 1896, when he opened the first sanatorium at Saranac Lake, NY, patients sat outdoors on the wide sun porches to take the "fresh air cure" and receive state-of-the art management of that era.(26) Unfortunately fresh air did not cure TB, and it was not until simple public health social distancing that TB declined sharply in the 1920s and 1930s. The societal struggle with TB demonstrates several parallels with the COVID-19 pandemic. Foremost is the clear and present danger posed by an infectious agent for which curative therapy is currently unavailable and for which only symptomatic management can be provided. This creates challenges to both health and wellness, because fear, anxiety, and frustration can threaten to overtake a rational approach to managing the situation of the moment.

A second parallel with TB is the temptation to embrace unproven therapies. For example, in the early 1880s interventions used to treat TB included "collapse therapies", in which physicians performed an elective pneumothorax, with the rationale for this procedure being to deprive the aerobic Mycobacteria of oxygen, in an attempt to kill them.(27) This procedure involved injecting oxygen or nitrogen into the chest cavity with increasing pressure until the lung collapsed. However, this collapse was not permanent, and it required repeating the procedure every few weeks. It has been estimated that more than 100,000 patients underwent this procedure in the 25 years after this technique was developed, despite that fact that there were

no rigorous studies conducted at the time to confirm its effectiveness.(28) It was not until 1943 that Albert Schatz discovered streptomycin, which initially proved successful as TB monotherapy, but, over time, combination therapy was required.(29) Similarly, trials are actively ongoing to treat COVID-19, including new antivirals, the use of hydroxychloroquine with azithromycin, anti-IL6 agents, and the development of vaccines to name just a few.(4)

We can learn from our past and realize that, even in the darkest times, there will be a bright future someday. As physicians our calling is to care for those in need. Ultimately, validation of effective treatments will lead to greater physician empowerment. In the meantime, wellness tools and strategies can help to manage our fears and anxiety while we practice medicine with the tools we have in the moment.

SOCIAL MEDIA DURING A GLOBAL PANDEMIC: THE GOOD, THE BAD, AND THE UGLY

With billions of active users across various social media platforms such as Facebook, Twitter, and Instagram, the manner in which we communicate and receive information has fundamentally changed. We have unprecedented instant access to information on a scale the world has never seen before.(30) Prior to the introduction of Facebook in 2006, including during the early stages of the internet, we relied upon a limited number of vetted resources for information, namely major media outlets or the daily newspaper. In 2020, however, we live in the age of “FakeNews,” and internet users need savviness and knowledge to identify factual information and ignore misinformation.(31) The opinions of celebrities, accounts with large numbers of followers, and online influencers are artificially equated with those of actual medical experts. This constant stream of information (and misinformation) can be overwhelming for anyone, let alone clinicians already facing stressful challenges in their professional and personal

lives. Prior to COVID-19, internet addiction was already recognized as a growing problem contributing to social anxiety, attention deficit hyperactivity disorder, and other aspects of wellness, which may only intensify during these trying times that are constantly reminding us of the stakes we face.(32) During a global pandemic, social media utilization can be beneficial for updates of important information related to current precautions and best practices and provide connections to needed resources. It can also help to connect physicians with loved ones across the globe who are having similar fears and are socially distanced. More information on managing social media during the pandemic is included in the e-supplement.

DEPRESSION, SUBSTANCE ABUSE, AND SUICIDE

There is a relative paucity of data and unknown prevalence regarding physician depression.(15). Systematic reviews of medical students and residents showed depression prevalence at 27% and 29% respectively.(15, 33, 34) A 2020 Medscape survey of approximately 15,000 physicians revealed a rate of depression of 15-18%.(35) Unfortunately, clinicians likely have incentive to conceal symptoms of depression for fear of putting hospital privileges or medical licenses in peril.(15) Thus, the prevalence is likely to be underestimated.(15) There are no known data regarding depression rates in allergists/ immunologists.

Suicide rates for physicians are estimated to be higher than the general public, and higher in female vs. male physicians. (15, 36) Physicians are more likely to succeed in suicide attempts than nonphysicians.(36) The 2020 Medscape survey revealed 21-22% of physicians had suicidal ideations and 1-2% had attempted suicide.(35) Risk factors for suicide include depression, being single, not having children, substance abuse, access to drugs, and associated stress and burnout.(36, 37) This has unfortunately also affected our field of allergy and immunology.(15)

While the exact prevalence of alcohol and drug addiction among clinicians is not known(15), physicians are not immune to substance abuse or exempt from personal tragedy of the current opioid epidemic.(15) Unfortunately, stigma remains among clinicians reporting depression, substance abuse, addiction, and those attempting suicide.(15)

With the increasing stresses and uncertainty regarding COVID-19, the clinician may be at an even greater risk. In fact, more than 70% of healthcare workers in China during this current pandemic reported psychological distress including insomnia, anxiety, and depression.(38) Addressing these issues with a mental health care professional may be needed, and it is important to understand warning signs of depression, anxiety, post-traumatic stress disorder, alcoholism, and substance abuse. Besides detection, understanding how to access safe and confidential resources to get help is key. In fact, most states have resources for clinicians seeking help through self-referral for depression, alcoholism, and/or substance abuse, and accessing these resources is confidential and does not need to interfere with licensure or medical practice. A listing of state physician health programs is available at https://www.fsphp.org/state-programs.

PROMOTING WELLNESS WHILE MAINTAING OUPATIENT PRACTICE DURING COVID-19

COVID-19 is adding to non-pandemic stresses of allergy and immunology physicians in practice, regardless of the clinical setting. For example, allergic conditions and COVID-19 symptoms have some overlap.(39) Lack of information regarding COVID-19 testing also can increase anxiety of both clinician and patient. Allergy and immunology services such as biologic therapy and immunoglobulin replacement therapy are medically necessary and keep patients out of the emergency department and hospital, potentially saving resources for the care of the COVID-19 patient.(40) However, recent guidance has suggested approaches such as telehealth

when service reductions are required.(4) Appropriate triage during the pandemic allows for effective social distancing; however, economic realities of service adjustments are inescapable, and the consequences of managing reduced revenue will create challenges to staff retention and maintaining a practice. Federal stimulus legislation may provide some relief of economic pressures during the pandemic. Advice to improve resilience during this time is outlined in Table 2 (41-44). More information on wellness at work and cost-effectiveness of physician wellness is included in the e-supplement**.**

WORKING AT HOME WITH CHILDREN

During the pandemic, school closures add a layer of complexity to finding a work-life balance. In addition, there are different family units, including single physician parent households, with a variety of custody arrangements. Parents of older children are coping with a unique set of stressors trying to help them navigate an uncertain landscape. High-schoolers currently applying to college are concerned because standardized college admissions tests and advanced placement exams are being cancelled, and they are unsure as to how this will affect their college admissions process. Many college students are anxious about whether their summer internships will be canceled, whether graduate degree programs will understand and accept that many colleges and universities are only providing pass/fail grades this semester, and how they will complete courses that depend on face to face interactions, which range from the performing arts to chemistry labs. Many seniors are grieving the loss of graduation ceremonies or are worried that their post-college full-time job offers will be rescinded. Across the spectrum of pediatrics, children with special needs require increased supervision, and parents may need to work in shifts to provide one-on-one attention. All of these factors translate to added stress on clinicians and patients alike.

Working from home while supervising clinical and/or research activities is challenging and requires new workflows. In this setting, clinicians must balance electronic medical record (EMR) communication and respond to urgent and routine messages. First, it is important to establish frequent, consistent video and/or phone communication with staff and assign bite-sized tasks. Breaking larger assignments into smaller concrete blocks can prevent overwhelming colleagues, increase empowerment, and nurture a sense of accomplishment and satisfaction. Second, it is important to realize that everyone is adjusting to new pandemic realities. Additional advice on working with kids at home is depicted in Table 3.(45-47)

COPING AND WELLNESS TOOLS

Now more than ever, healthcare providers need to practice self-care. Coping with rapidly changing recommendations can become overwhelming, while stress and anxiety can become insidious bedfellows escalating a cycle of tension both at home and work. Paradoxically, at a time when social distance is strongly encouraged, we can all find ourselves more interwoven with one another in a common struggle to persevere against an unimaginable global challenge. While we face the defining moment of our time, resilience, compassion and serenity may be great assets.

Many of us are filled with a mix of complicated emotions at this time. Strategies that have worked for us in the past, like getting together in person with friends, family or colleagues, are not available while practicing social distancing. This loss of personal connectivity leads to further struggles for many. At this time, we need to look for ways to connect virtually and ensure we are attending to clinician wellness. This pandemic is unlike anything most have experienced before. But we are able to learn from those that came before us that faced September 11, 2001, Hurricane Katrina, SARS and H1N1 flu epidemics.

The Strength-Focused and Meaning-Oriented Approach to Resilience and Transformation (SMART), which is typically employed by social workers after a crisis to help survivors develop resilience to get through and transform and grow in the process, can be used today in our present crisis.(48) The framework utilizes mind, body and spirit approaches to foster awareness, develop strength, and discover meaning. It addresses this through “emphasizing growth through pain” by focusing on what personal strengths may develop through the experience. It “teaches the mind-body-spirit connection” in recognizing that by taking care of our physical needs we can boost our mood and mental strength. Furthermore,” developing an appreciation of nature”, we are encouraged to appreciate the small things in life, appreciate our own life and those of loved ones around us. By “facilitating cognitive re-appraisal” we can develop new perspectives and remember resilient experiences during other crisis and past successes. “Nourishing social support” allows us to improve and enhance our development and resilience while simultaneously having a sense of acceptance and connectedness while learning to recognize and appreciate the support offered from those around us. The final tenet of this approach includes “promoting the compassionate helper principle” in which we learn from traumatic experiences by extending compassion to ourselves and others.

Even in the best of times, healthcare professionals often do not seek assistance when they are experiencing stress, burnout, depression and suicidality due to concerns regarding confidentiality, cost, time, licensing and career concerns and stigma. Prospos et al selected and evaluated several web-based resources according to the American Psychiatric Association “app evaluation framework” (49) to be used as a starting point to address depression, stress, and suicidal ideation, noting that ideal interventions would be effective, “convenient, accessible, affordable, and confidential” and ideally would be used in conjunction with direct professional care.(50) The resources chosen would address the treatment approaches utilized to address

burnout among healthcare professionals: meditation, breath work, relaxation techniques, mindfulness training, cognitive behavioral therapy, and suicide prevention. The applications they recommended include Breath2Relax, Headspace, MoodGYM, Stress Gym, Stay Alive and Virtual Hope Box. Of note, the only one that has been assessed for efficacy in healthcare professionals was MoodGYM, which was shown to reduce suicidal ideation among medical interns.(51) Mindfulness-based therapy platforms can allow for a sense of community, connectedness and a platform to share successes and promote resilience.(52) Additional wellness resources are outlined in Table 4.

At this time of social distancing it is important to maintain a schedule and your morning routine even if you do not have to leave the house. Enjoy nature while maintaining social distances. Take the time to connect with others virtually if you are feeling lonely via phone, email, and video platforms.(53) When feeling overwhelmed by the number of people in the house, take some time for yourself in another room or go outside. Use the resources mentioned in this article to get support digitally. If this does not suffice, please reach out for professional help. Supports may be in place from local universities, the AMA, and state and local professional societies. Limiting your news and social media consumption that you find upsetting may also reduce stress. Avoid using alcohol and other drugs to deal with your emotions – instead, utilize the skills that have enabled you to get through difficult situations in the past.(54) Practicing compassion with yourself and others is also helpful.(55) Initiating a gratitude practice has been shown to improve a sense of connection, quality and amount of sleep and has improved well-being.(56) This can be achieved through a gratitude journal in which you write daily entries about someone or something you are grateful for or listing three good things daily, which has been shown to reduce symptoms of depression and improve well-being.(57) Engaging in a religious or spirituality practice has been associated with improved coping, strategies of

acceptance, and less burnout in internal medicine and pediatric interns.(58) Lastly, allowing time to debrief, meditate, or discuss challenging situations and grief can be helpful to prevent burnout.(59)

Governmental and health care agencies, institutions, and professional societies can help by sharing and continually updating information and resources. Communication that is concise, clear, transparent, timely, and thoughtful will help build a sense of control in health care providers.(13) Data from the A/H1N1 pandemic revealed that sufficiency of information was associated with reduced worry.(60) Freeing providers from administrative tasks will allow peak performance for longer periods of time. Leadership should encourage all providers to strive to live the tenets of physician wellness.(13)

CONCLUSION

"World War V" is clearly upon us, with all the attendant anxieties and disruptions one might imagine when fighting an invisible enemy on home turf.(61) We are faced with a new reality that has changed our culture, implicit assumptions, and basic underpinnings of our daily work. Mandated "stay-at-home" orders and self-quarantine social norms seem to have arrived overnight in some areas of the country, but a patchwork of inconsistency adds to a dizzying assessment of risk - and if we as medical experts find ourselves occasionally off balance, it is certain that our patients likely feel the same.

Clinician wellness can be an overlooked and marginalized aspect of our lives. In the daily hustle, self-care may often be a last priority as we continue to practice in a field of self-sacrifice and service to others. But if we don't realize it in the beginning, we will certainly realize it in the end that without self-care we will have nothing left to offer to anyone. The caregiver must take care of him/herself if they want to do a good job taking care of others.

COVID-19 has arrived, and life is different. As we realize that we are in a seminal moment, that future generations may refer to “pre-COVID” and “post-COVID”(61), we must also pause to reflect, to breathe, and to care for ourselves and our loved ones. This COVID-19 pandemic will pass, and although SARS-CoV-2 may see a slow burn with seasonal encores in the next several years, the practice of allergy and immunology will continue to provide critical services, even as our infrastructure is temporarily reorganized during social distancing. As a specialty, allergy and immunology will continue to lead, and as our community comes together, we will persevere. Take care of yourself.

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605 **Tables**

606 Table 1. Tips to maximize the benefits of social media as a medical professional.

Mindfulness	• Turn off all social media notifications - do not let your device dictate your life • Schedule time each day to interact with social media at a time when you are engaged and not distracted • Recognize when you are forming an emotional response and take time away when necessary • Develop habits to reinforce not interacting with electronics first thing in the morning or prior to sleep
Productivity	• Follow professional organizations to receive up to date vetted information • Follow journals of interest for the latest publications • Follow leaders and mentors in the field.
Reaching a target audience	• Provide valuable content • Use common hashtags when posting information • Incorporate links to longer format articles or online resources • Use pictures, videos, gifs to increase engagement • Comment on posts from other accounts • Repost interesting or important information from other accounts • Answer questions when posed
Professionalism	• Maintain patient privacy at all times • Never provide individual medical advice; can direct towards general information or recommend contacting one's personal physician • Avoid cursing, strong political statements, or religious affirmations • Think twice before posting - once you hit send, it can never be completely deleted • Your opinions DO reflect your employer, even if stated otherwise; be aware of existing social media policies at your workplace
Balancing Clinician Wellness During COVID-19	• Engage in non-professional related online endeavors, i.e. podcasts pertaining to areas of interest • Find social groups of similar interests to your own and engage or simply follow • Seek out groups and friends with positive, uplifting messaging • Implement social media to share resources, such as PPE access. • Use social media to promote kindness to others and connect with those that are socially distanced.

607

608 **Table 2. Tips for Allergy and Immunology Practice Resilience During the COVID-19**

609 **Pandemic**

Utilize Telehealth
Postpone Non-Essential Patient Visits and Procedures
Create a Practice Task Force for Addressing and Implementing Changes
Train Staff On Implemented Changes
Collaborate With Other Allergy and Immunology Colleagues
Review Practice Finances and Plan for Income Changes
Over-communicate with Patients

610

Table 3. Suggested strategies for being productive at home with children of different ages.

- Have a daily schedule and stick to it. Kids do better when they know what to expect.
- Post this schedule where everyone can see it. You can use pictures instead of words for younger children.
- If you have another adult at home, one method would be to alternate work and childcare hours for each of you.
- Older children can do their school work if they have it while you are "seeing" patients. Older children could also supervise younger children and help with educational activities.
- If you do not have help at home, another approach would be to work when the children are sleeping or safely engaged in a quiet activity. Schedule meetings if possible during nap time.
- For younger kids, bringing new or special toys can help keep them engaged for longer periods of time. Movies are another enjoyable option.
- Allow kids to socialize remotely with friends and family via face time, skype, etc.
- For older children, set daily goals and reward them. Allow them to play outside with siblings while maintaining social distancing.
- Have children do chores and help out around the house.
- Use the mute button during conference calls and have a silent do not disturb signal for when you are on important calls. You can also post a sign that signals that you are working.
- Being proactive and spending quality time with kids, during which you provide undivided attention, will also give you more uninterrupted time to work.
- Schedule times to get physical activity for you and the children, ideally together.

634 Table 4: Physician Wellness resources

Online Resources	
AAAAI Physician Wellness Toolkit	https://www.aaaai.org/practice-resources/running-your-practice/practice-management-resources/wellness
AMA steps forward	https://edhub.ama-assn.org/steps-forward
Stanford WellMD	https://wellmd.stanford.edu
Institute for healthcare improvement	www.ihi.org
Alliance for Academic Internal Medicine (AAIM) - Collaborative for Healing and Renewal in Medicine(CHARM)	https://www.im.org/resources/wellness-resiliency/charm
Meditation and Mindfulness Apps	
Art of Living - Online Happiness Program for Healthcare Workers (no charge during COVID-19)	https://www.aolf.me/covid19
Headspace	https://www.headspace.com/covid-19
Ten percent happier	https://www.tenpercent.com/coronavirussanityguide

635

Figure Legends

Figure 1: The Coronavirus Pandemic in Italy. Reproduced from JAMA. Published online March 17, 2020. Doi:10.1001/jama.2020.4344.

Figure 2: Health state transition and outcomes of burnout. A listing of state physician health programs is available at https://www.fsphp.org/state-programs.

Figure 3 Stages of Grief.

Elizabeth Kubler Ross defined 5 stages of grieving: denial, anger, bargaining, sadness, and acceptance. More recently, these stages have been updated to disbelief, yearning, anger, depression, and acceptance, with the depression peaking at approximately 6 months post-loss and acceptance not until 24 months post-loss. Reproduced from Maciejewski PK, Zhang B, Block SD, Prigerson HG. An empirical examination of the stage theory of grief. JAMA. 2007;297(7):716-23.

Coronavirus Disease 2019 (COVID-19) in Italy

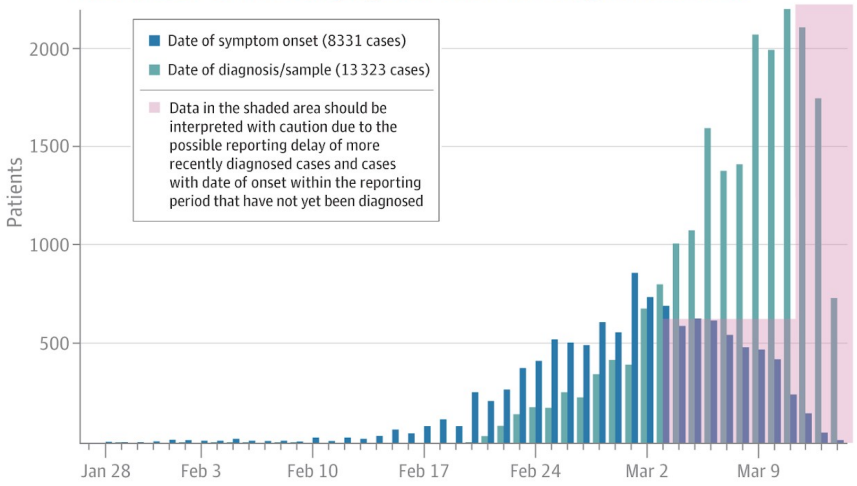
Data as of March 15, 2020

22 512
cases of COVID-19

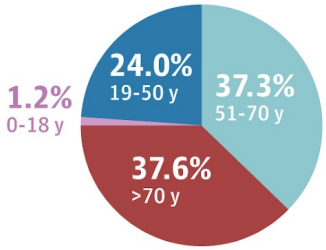
2026
cases of COVID-19 among health care workers

1625
deaths

Timeline of COVID-19 symptom onset and diagnosis in 2020

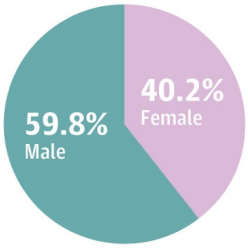


Cases by age range

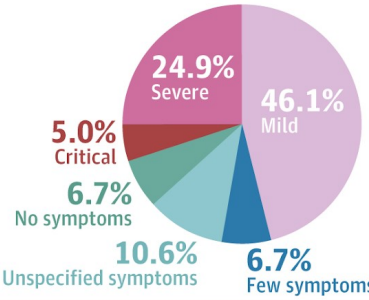


Median age, 64 y

Cases by sex

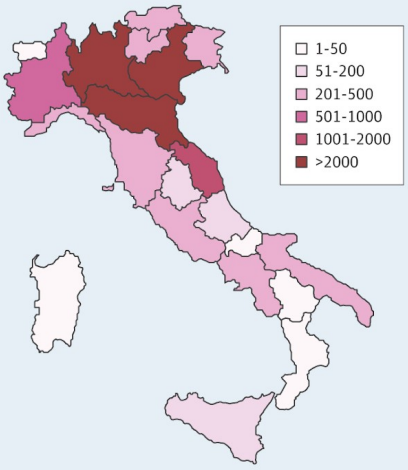


Cases by severity



Age, y	Deaths, No. (% of total)	Case-fatality rate, %
0-9	0	0
10-19	0	0
20-29	0	0
30-39	4 (0.25)	0.3
40-49	10 (0.62)	0.4
50-59	43 (2.65)	1.0
60-69	139 (8.55)	3.5
70-79	578 (35.57)	12.5
80-89	694 (42.71)	19.7
≥90	156 (9.6)	22.7
Not reported	1 (0.06)	0.6
Total	**1625 (100)**	**7.2**

Cases by region/province of diagnosis

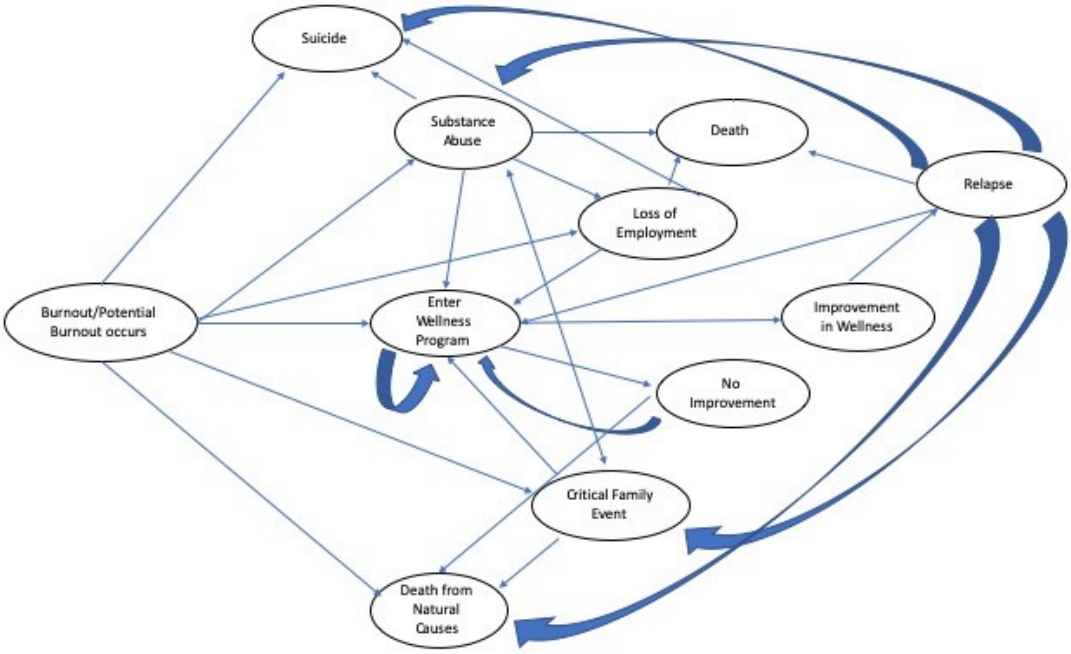


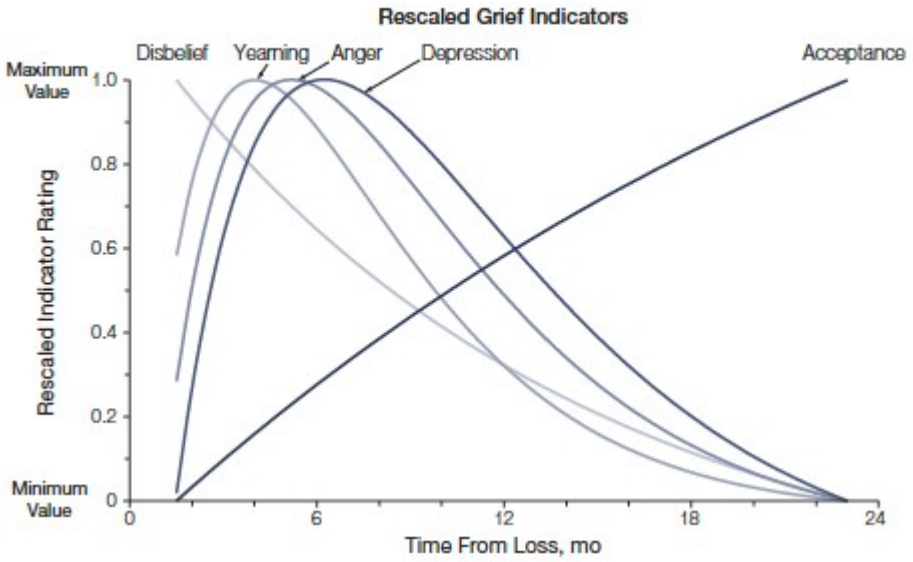
Authors: Edward Livingston, MD; Karen Bucher, MA, CMI

Sources: Adapted from the COVID-19 Task Force of the Department of Infectious Diseases and the IT Service Istituto Superiore di Sanità. https://www.iss.it/infografiche

Please cite as: *JAMA*. Published online March 17, 2020. doi:10.1001/jama.2020.4344

JAMA Network


Suicide
Substance Abuse
Death
Relapse
Loss of Employment
Burnout/Potential Burnout occurs
Enter Wellness Program
Improvement in Wellness
No Improvement
Critical Family Event
Death from Natural Causes



E-SUPPLEMENT

PANDEMIC SOCIAL MEDIA AND THE ALLERGIST/IMMUNOLOGIST

During these stressful times, medical professionals can utilize social media to benefit themselves as well as their patients. In addition to the Centers for Disease Control, trusted medical organizations such as the AAAAI, NIAID, and the World Health Organization can be accessed for resources to help clinicians prepare but can also be utilized to curate and share information with others as well. Clinicians should embrace the trusted relationships they have developed with their own patients as well as the desire of the general public and media to hear from experts.(E1) Those already active on social media can serve as a valuable resource to provide perspective, general information, and address misinformation. One example of conflicting reports from mainstream media that have circulated on social media during the COVID-19 pandemic involves confusion regarding risk of using corticosteroids during active infection, a topic that is pertinent to patients with asthma. In this example, professionals can use their role on social media to provide anticipatory guidance to patients with asthma by reinforcing the need to maintain inhaled corticosteroid controller medications in order to try and prevent exacerbations, and highlighting the importance of understanding when and how to start treatment should symptoms occur. In an online world filled with misinformation and fear mongering, clinicians can use their social media presence to promote preparedness, encourage positive behavior change, and spread accurate information instead of panic.(E2) Medical professionals who are not active on social media can still utilize these platforms to better understand the common questions or points of confusion being discussed. This can aid anticipatory guidance with individual patients who may not raise these concerns on their own during clinical encounters, or provide resources on practice websites addressing frequently asked questions.

It is also important for clinicians to recognize how their use of social media may impact their well-being. There are simple, yet effective, strategies that merit review for all medical professionals who use social media in order to maximize benefit and mitigate risk, Table 1. In addition, clinicians can seek out social media groups that provide professional and emotional support.(E3, E4) There are countless examples of online groups that provide comfort and collegiality, which can be extremely important for those in community-based outpatient practices who may have limited interactions with colleagues and those that may have temporarily closed their practices due to current social distancing guidelines. The Physicians Moms Group on Facebook is one of the more prominent examples, where over 70,000 women share personal and professional stories with one another in a closed forum. Now more than ever, it is important for all of us to be mindful of our social media habits, recognize when our online interactions encroach upon our well-being, and utilize social media in a positive manner.

WELLNESS AT WORK

Telehealth can minimize risk and promote safety, and newly developed AAAAI resources exist to help the clinician get started.(E5-7) Creating a practice task force to assess recommendations from local, state, and federal governments, as well as medical societies can be helpful at the onset.(8) Obtaining personal protective equipment is essential, although challenging in the current rationed environment. In addition, collaborating with other local allergists and immunologists can facilitate idea exchange and highlight the reality that, even at a social distance, we are not alone.(E8) Engaging the healthcare team at the beginning of a workday will help to prevent many stressful situations and also help to lay a scaffold to quickly resolve problems that do arise.(E9) At this time, social distancing is critical to mitigating COVID-19, as is routine and increased office and equipment cleaning.(E10)

From the business standpoint, cross-training employees and preparing for increased absenteeism is necessary.(E10) Reviewing practice finances including cash flow and having a plan for decreased income due to potentially less numbers of patients and procedures is necessary, and it is hoped that recent federal legislation will provide some respite.(E10)Specifically, the Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020, passed in the Senate with bipartisan support on March 25, 2020, may provide more than 2 trillion in total relief and $350 billion in support for small businesses.(E11) It is important to remember that some allergists and immunologists may temporarily suspend in-office operations or provide care almost exclusively by telehealth, depending on a variety of individual factors, including personal and professional. Preparing for this possibility is advisable.(E8)

Regarding patient care, overcommunication is preferred.(8) Postponing nonessential appointments or procedures is recommended and necessary for social distancing to be effective; however, patient-specific decisions should still be determined by the individual clinician clinical judgement.(E8, E12) Patients may be more or less concerned about the COVID-19 pandemic than their clinicians, and may be receiving information (and misinformation) from a variety of sources. Reinforcing the concept of social distancing as well as the importance of adequate sleep, exercise (with social distance in mind), and diet is sound advice. Discussing the ways in which the practice is adapting care in the COVID-19 pandemic era includes active communication methods such as HIPAA secure text messaging and email software; social media updates via platforms such as Facebook, Twitter and Instagram;, consistently updating the practice website;, and placing well-marked educational signage. These interventions can help alleviate patient concerns. Of note, avoidance of stigmatizing groups of people due to suspected or actual infection is fundamental.(E13, E14)

COST-EFFECTIVENESS OF CLINICIAN WELLNESS

The effect of clinician wellness and wellness programs may be life-changing and life-saving. Unfortunately, even outside of a pandemic the risk of burnout and consequences of ignoring aspects of wellness are underappreciated and often undervalued. While cost-effectiveness analyses can be a useful analytical tool to understand whether financial trade-offs are worth gains in quality-of-life, the health and economic consequences of ignoring personal wellness in the practice of medicine have not been well studied.

In the Medscape 2019 physician compensation report, primary care providers earned an average of $237K per year and average annual specialist compensation was $341K.(E15) In this report of 19,328 respondents across 30+ specialties, annual compensation for allergy and immunology was $274K. While physicians spent an average of 37-40 hours in patient care, 36% of respondents spent 20 hours or more on paperwork and administration per week.(E15) This represents a dramatic increase from 2012, where 53% of physicians spent about 1-4 hours on paperwork.(E15) While a majority felt rewarded by either patient relationships, problem solving, or making the world a better place, 2% of physicians reported nothing about their job was rewarding.(E15) Seventy-three percent of Allergy and Immunology physicians would choose medicine again, with 82% of those preferring to remain in their chosen field of practice.(E15)

To illustrate the potential cost-effectiveness of clinician wellness, we constructed a simple Markov model evaluating a cohort of physicians earning the mean salary for allergy and immunology, working 40 hours per week in direct patient care with 10 hours per week spent on administrative tasks.(E16) While the health state utility of wellness is unknown, we explored plausible disutility (e.g., negative health detriment from an action) ranges of 1-5% compared to an idealized practice of work-life balance over a 30 year model horizon, starting practice at 30

years of age. Future costs and utilities were uniformly discounted at 3% per annum with all-cause age-adjusted mortality incorporated into the model and 1-year cycle length.(E17, E18)

When considering medical practice, cost effective care is defined as care costing less than $100,000/QALY, with a quality-adjusted life-year (QALY) measured by the relative trade-off between a perfect year of wellness vs challenges associated with burnout resulting from inattention to personal wellness.(E16) In this wellness model, while a 1% equal reduction in health state utility and compensation demonstrated cost-effectiveness of wellness of $269,440 per QALY, a 10% disutilty with 5% compensation reduction cost $137,469 per quality-adjusted life-year QALY, while a 15% health disutility with 5% compensation reduction cost $91,646 per QALY. At a 20% relative disutility of wellness, a 5% reduction in compensation cost $68,735 per QALY. Findings from the physician cost-effectiveness wellness model confirmed that attention to wellness can be a cost-effective prospect, even if requiring a reduction in compensation.

COVID-19 ALLERGY SOCIETY SUPPORTS

The North American Allergy and Immunology professional societies - the American Academy of Allergy, Asthma and Immunology (AAAAI), the American College of Allergy, Asthma and Immunology (ACAAI) and the Canadian Society of Allergy and Clinical Immunology (CSACI) - are providing real-time resources to help on-the-ground clinicians navigate the COVID-19 pandemic. While challenges to allergists/immunologists vary contextually by private, hospital, or academic practice, societal leadership and collegial support is crucial. These organizations are uniquely positioned to provide resources for contingency planning, advocacy, education, and research priorities during these challenging times. Recently the AAAAI, ACAAI and CSACI endorsed a framework for COVID-19 contingency planning in

the allergy and immunology clinics in addition to distributing and/or promoting videos, podcasts, social media outreach, and, community forums, and virtual journal club.(E19) Through leveraging global health expertise these allergy societies have taken action, such as mobilizing a COVID-19 Task Force charged with real-time monitoring of a fluid and ever-changing pandemic and initiating rapid response communication of critical information. During this time, coordinated messaging from North American allergy and immunology societies can play a pivotal role in advocacy at the federal and state levels to address issues such as expanding coverage for telehealth services nationwide and the mitigating the financial impact of the pandemic on private practices.(E20-22)

HOW NEW STRATEGIES AND NOVEL PARADIGMS OF CARE DELIVERY CAN HELP

Allergy/Immunology clinic contingency planning can allow for compliance with local and state regulations being increasingly required to defer non-essential medical services during shelter-in-place mandates.(19) Through this pandemic the ability to persevere will both require and nourish resilience - a key wellness tool.

The rapid adoption of telehealth is a critical component of COVID-19 care. Without a doubt, the advent of telehealth in the past few years will be a saving grace, and the rapid incorporation of this service into daily practice will no doubt be a lasting legacy of COVID-19. While it is not always a perfect surrogate for an in-office visit, when viewing the current situation as temporary, it may allow most care to resume without too much interruption outside of certain parts of the physical exam and certain procedures. Many regulations regarding telehealth have been relaxed during the pandemic, allowing for practice across state lines without having to have a license in that state, with use of less HIPPA compliant vehicles for communication, and ensuring that video visits can be reimbursed at the same level as an in-office

visit for the same issue. (E6, E7, E23) Telehealth services can also provide access to aspects of care unavailable with in-person visits, such as creating the avenue for virtual home-visits and, despite social distancing, providing a different view into patient and family needs in the more personal context of their own home. Telehealth may also create conversations with multiple family members to better inform practice - individuals who can inform care and help to promote adherence in ways that may not happen with conventional visits.(E7)

An added telehealth benefit may also be improved overall productivity from individual clinicians as well.(E24) Following the pandemic, the ability to conserve some of the more relaxed telehealth standards could be of significant benefit to expanding the reach of a practice into lesser served areas as well.(E25) This crisis will certainly foster creativity in rethinking the way that we deliver care and provide an opportunity to do things better for our patients. There are a few practical examples of this. Economic models have been previously published that have noted the safety of home biologic agent administration(E26), lack of necessity to activate EMS and seek emergency care after using epinephrine if the patient stabilizes(E27), and the necessity for screening even high-risk infants for early peanut introduction under the NIAID guidelines(E28, E29) A better understanding of what services prove essential, where patient-preferences may leverage shared decision making (E30), and what aspects of care can be reduced or shifted from an in-office to a telehealth or at-home platform will maximize health and economic outcomes of care during the pandemic. These approaches will allow our specialty to better focus on increasing the value of the care we provide and expand the access to that care.

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