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The NEW ENGLAND JOURNAL of MEDICINE

February 18, 2021

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On behalf of the entire *New England Journal of Medicine* staff, please accept my wishes for a rewarding career.

Sincerely,

Eric J. Rubin, MD, PhD

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Exploring Telemedicine Physician Practice Opportunities

Options are abundant for physicians with a good 'webside' manner and willingness to adapt, but due diligence is essential

By Bonnie Darves

Telemedicine, in the form of virtual patient visits using video platforms, has been making inroads into the broader physician practice realm for more than a decade, but when the pandemic hit, it exploded. Practically overnight, traditional practices and health systems scrambled to get technology in place to ensure that patients at risk for contracting the coronavirus — or experiencing poor outcomes if they did get COVID-19 — had some means of connecting with their physicians. Simultaneously, companies that were already in the virtual-visit business experienced exponential growth in demand for physicians to provide services.

"It's been nothing short of a seismic effect," said John Frey, founder of the National Coalition of Healthcare Recruiters (NCHR) in Washington, West Virginia. "Telemedicine was happening, but the coronavirus cracked the egg wide open." NCHR members are reporting major increases in the number of clients, existing and new, seeking physicians to fill telemedicine positions.

Lou Anne Gonzales, president of Advanced Physician Recruitment in Overland Park, Kansas, who already had a solid footing in telehealth recruiting and consults on telehealth solutions, has seen a huge increase in demand from both sides of the picture: clients who need physicians to fill newly created positions and physicians who want to explore virtual-care practice opportunities. "I'm hearing from 10 to 12 physicians a week looking for positions where they can do some telemedicine — or do virtual practice exclusively," Ms. Gonzales said. "This high level of physician interest is something I haven't seen before."

Regardless of whether physicians are seeking a full-time telemedicine position or a part-time opportunity to moonlight doing virtual visits, telehealth practice is here to stay, according to Joseph Kvedar, MD, who is president of the American Telemedicine Association and a virtual-care innovator at Partners HealthCare in Boston. "Wherever physicians practice, whether that's in a clinic or with a digital-first primary care organization, they'll be doing some telehealth now," he said.

Telemedicine: It's here to stay

A recent study by the COVID-19 Healthcare Coalition Impact Study Work Group, in which Dr. Kvedar participated, found that telehealth claims increased 50 to 100 times in several US states between July 2019 and July 2020, and grew significantly in all states. A companion survey of 1,594 physicians and health professionals last summer found that 83.6 percent had engaged in interactive video patient visits in 2020 and that nearly 40 percent averaged more than 20 virtual visits a week.

In Dr. Kvedar's view, the issue now is not whether physicians will practice telemedicine but what their practice will look like. "We're at the point now where it's a question of how physicians will use it and how they'll determine which clinical cases should be in office and which might be virtual," he said. "I think we'll see physicians joining practices where they'll have 60 percent in-person and 40 percent telehealth visits. We'll also see physicians who do 100 percent virtual practice with four or five companies — they'll be the Uber drivers of health care."

The model's appeal is obvious for physicians seeking flexibility in their lives, to care for young children or aging parents, for example. Still others will seek part-time, limited telehealth opportunities to increase their income and pay off education debt more quickly. Some might choose the model out of pure preference, after trying it out and finding it a good fit.

That's the case for Kurt Gilbert, MD, an internist in Cookeville, Tennessee. He was practicing as a hospitalist but then started seeing patients virtually when the pandemic hit. "I've always had an interest in telemedicine, and once I tried it, I really liked it. So, I'm now practicing telemedicine full time, from home," said Dr. Gilbert, who works with Doctor On Demand, the company cofounded by the TV personality Dr. Phil. "The big difference for me now is that when my shift is over, I'm done. And when I want to see my 17-month-old on my lunch break, I can. For me, it's a dream job, and the patients love it because they can choose the visit time."

Dr. Gilbert sees patients in the numerous states where he is licensed. His care ranges from acute and urgent-care issues and chronic condition management to regular follow-up care for patients with whom he has established relationships. When a situation requires emergent medical attention, Doctor on Demand's emergency support team steps in.

For Krista Grow, MD, a Kansas emergency medicine physician, telemedicine provided has proved an ideal solution to an intermediate-term family need. Her husband is doing his fellowship at the Cleveland Clinic, so the family moved to Ohio to stay together. Dr. Grow started doing some telehealth practice, about 12 hours a month, through Sycamore Independent Physicians of Alabama, and she also commutes to Kansas for ER shifts several days a month. "The [virtual-visit] care model is sort of slow-paced for me, but I find the work fulfilling. I'm often taking care of patients who can't see their physician or who have lost their job and their benefits," she said. "It's rewarding to be able to help people when they need it."

Larson Hicks, CEO of Sycamore Independent Physicians, reports a definite uptick in physicians seeking practice arrangements like Dr. Grow's, either out of personal interest or because of declining patient volumes in the wake of the pandemic. "We have some independent physicians who practice telemedicine because they want to diversify their practice portfolio or gain a new revenue stream. Others like the platforms because they can build their own panel of patients or fill in a hole in their schedule," said Mr. Hicks. His company, whose primary business is in emergency medicine locum tenens services, has placed 150 physicians in telemedicine positions in 2020. While many work in locums-type models, others are moving into more structured, permanent arrangements.

Whatever telemedicine model physicians are interested in, they'll find opportunities, said Ateev Mehrotra, MD, MPH, a Harvard health care policy researcher and hospitalist at Beth Israel Deaconess Medical Center in Boston. "If physicians want to be free spirits, they can do 100 percent telemedicine," he said. At companies like Blue Sky Neurology, physicians do virtual consults on stroke or neurological disorders. In radiology, an early telemedicine entrant, the market for all-remote positions has expanded dramatically, Dr. Mehrotra added, and psychiatry has seen major growth in all-virtual and hybrid models. "We're seeing psychiatrists whose schedules include in-person clinic one or two days a week and tele-psychiatry visits at home in the evenings, for example," he said. "Moving forward, physicians across all specialties will be engaging in more remote patient monitoring, especially for patients with chronic conditions. The innovations we're seeing will give physicians a lot more flexibility than they've had before."

Even hospitalist medicine is moving into remote care. Sound Physicians, a long-established hospitalist company, now offers tele-hospitalist positions in which home-stationed hospitalists work collaboratively with onsite hospital nurses and physicians to triage patients and create care plans. "Our tele-hospitalists might be supporting five to eight hospitals on a shift, and they have more control over how they manage the requests and alerts in

their queue than they might in the hospital," said Brian Carpenter, MD, the company's national medical director. Sound Physicians is also moving into tele-SNF (skilled nursing facility) and virtual transitional care for discharged patients, providing a new range of telemedicine physician practice opportunities.

What telemedicine organizations look for

All sources interviewed for this article agreed that practicing telemedicine requires a change of mindset and that physicians who want to do virtual practice need a few years of post-training practice experience before making the shift. Moving from in-office visits to virtual ones is a definite adjustment because video visits obviously don't allow for a traditional physical exam. Physicians who need to listen to the heart and lungs, check a patient's ears, or examine a rash must use technology. They'll also have to be extra diligent in obtaining a history in new patients and adept at establishing rapport quickly. "Not everyone can communicate effectively virtually, so that's one of the qualities we screen for, in addition to solid experience," Dr. Carpenter said. His company seeks hospitalists with at least three years of onsite practice experience, for example, as well as a strong critical care comfort level.

"Beyond practice experience, telemedicine organizations are looking for is physicians who are personable, adaptable, and willing to learn something new," Mr. Hicks said. It also helps when physicians have licenses in multiple states. That's become easier with the advent of the Interstate Medical Licensure Compact, which expedites licensing among its 30 participating states.

Tony Yuan, MD, medical director at Doctor On Demand, which employs 600 physicians and has seen a dramatic spike in demand in 2020, boils it down to what he calls good "webside" manner. "Anyone can learn the skills and pick up the technology, but we're looking for physicians who present themselves well, who are compassionate and approachable," Dr. Yuan said, "and who can adapt to the volume." Most video visits are scheduled for 15 minutes, with a short buffer between visits. Doctor on Demand physicians may take as much time as they need or extend a visit when necessary, but the basic expectation is that they'll see four patients an hour. The company provides extensive training, a robust support system, and an integrated electronic health record.

Doctor on Demand has two primary models, a 32-hour work week and a 40-hour schedule, with some flexibility to break up visit "blocks" to suit personal or family needs. The company looks for a minimum commitment of 60 hours a month. Compensation, Dr. Yuan said, is "on par" with the income physicians would receive in a traditional care model. The virtual practice model, he added, is ideal for primary care physicians, emergency medicine physicians, pediatricians, and psychiatrists. "We can't hire people fast enough, and we're hearing from physicians who tell us that they didn't even know these options existed," Dr. Yuan said.

Tyler Covey, CPA, who is CEO of the national firm MDstaffers in Rancho Cordova, California, echoes that demand-versus-supply dilemma. His company filled 900 telemedicine positions (for physicians and advance practice clinicians) in a single month and has seen the demand for behavioral health professionals and primary care clinicians "pretty much explode." The physicians that MDstaffers has placed practice in a variety of settings, from dedicated virtual clinics to call centers to their own homes.

"There's a lot of variation, but for physicians, I think the important thing is ensuring the organization is well equipped to support virtual care," Mr. Covey said. Ideally, that means having dedicated support personnel, top-notch technology, a system for ensuring patients are prepared for the visit, and a platform in which the electronic health record (EHR) is integrated. "Not all telemedicine jobs are created equally," he said.

Kurt Schussler, a managing partner of Medical Advantage Recruiters in Addison, Texas, whose company is seeing skyrocketing demand for telemedicine physicians, urges physicians to thoroughly research both the position and the organization offering it. "It's important to know how the organization is structured, how much support they'll receive, and whether the entity is financially solid," Mr. Schussler said. That due diligence includes obtaining credit reports and speaking to physicians who work for the organization to ensure that compensation is equitable, as advertised, and paid timely.

Kaiser: the 'gold standard' keeps innovating

Organizations that want to do virtual care right might look to Kaiser Permanente for expert instruction. Kaiser has been delivering telemedicine services and virtual care for more than 15 years, in a highly organized, orchestrated, and integrated manner. All physicians who practice with The

Permanente Medical Group — with 9,000 physicians, TPMG is the country's largest — are equipped with video cameras, state-of-the-art information technology, dedicated smartphones, and a system that enables physicians to quickly "accelerate" care when specialists are needed. Even with those components in place, Kaiser had to adjust to accommodate the new environment after the coronavirus hit, said Richard S. Isaacs, MD, TPMG's CEO and executive director.

"When the shelter-in-place mandate came, we had to move to a video-care-first strategy almost overnight and we quickly converted to conducting 90 percent of all exams on video," Dr. Isaacs said. "What we're seeing is that patients really love video visits, both the convenience and the personalization." By August 2020, Kaiser was conducting nearly 25,000 video visits daily in its Northern California region alone and provided four million in the first three quarters of 2020 across all eight Permanente Medical Groups.

Although Kaiser had long been using virtual visits for preventive care and some follow-up care, behavioral health, and dermatology, the pandemic spurred innovations in other clinical areas. A Kaiser pilot in tele-critical care, for example, has become part of a sophisticated hybrid-care model going forward, in which specialists perform remote monitoring and proceduralists provide direct patient care in the ICUs. "Our physicians are really enjoying this — it's as if they're part of a team like the Navy SEALS," Dr. Isaacs said.

A more recent innovation involves virtual cancer care. Kaiser oncologists recently began using primarily video visits for oncology patients, who, because of their compromised immune systems, may be especially vulnerable to COVID-19 infection and poor outcomes. Tatjana Kolevska, MD, chair of the Kaiser Permanente Northern California Oncology and Hematology Chiefs Group, spearheaded the effort to move almost all oncology care to phone or video appointments, in very short order. "We moved from 15 percent before the pandemic to 98 percent [virtual visits] within a week, and it's been very successful," she said. "We've discovered that physicians find it easier to act on issues that patients are experiencing. And the video visits make it easier for caregivers to participate."

Dr. Kolevska said that somewhat surprisingly, the majority of Kaiser oncology patients, based on survey findings, have proved amenable to having even sensitive issues such as a new diagnosis or a treatment failure discussed using virtual visits. "We've seen a significant increase in patient satisfaction overall with the video visits," said Dr. Kolevska. Kaiser is also convening multidisciplinary patient conferences and tumor boards completely virtually now, enabling oncologists and other specialists from across the organization to review and guide care.

In Dr. Kvedar's vision of the future, virtual care and telehealth will play an increasingly larger role in most physicians' lives, with mostly beneficial results, especially when physicians manage patients who can't readily get to care facilities. But telemedicine won't supplant face-to-face visits, he said, or obviate onsite physical exams. "Most of us chose this career path because we want to help people and form that bond, which might be harder in a virtual setting," he said. "At the same time, I see telemedicine and its flexible work environment as extremely liberating for physicians."

Considering a Telemedicine Job? Ask the Important Questions

There's so much going on in telemedicine today that it can be daunting to physicians trying to explore the fast-evolving marketplace and compare different practice opportunities that are wholly or predominately virtual. Because there are so many new players in the market and organizations offering positions differ widely, it's a bit of a Wild West out there. For that reason, it's very important for physicians considering telemedicine practice to obtain as much information as possible before making a commitment.

Sources interviewed for this article offered tips for navigating the telemedicine market and making informed decisions:

- "It's important to ask how patients will be prepared for virtual visits, whether there's a dedicated virtual exam room, and whether they'll have a well-trained assistant to help support them. Physicians practicing telemedicine will have the highest satisfaction if all these components are in place." — *Lou Ann Gonzales, Advanced Physician Recruitment*
- "Physicians need to know the types of patients they'll see, what the volume expectations are, and what's required in terms of schedule and call to reach the stated compensation levels." — *Kurt Schussler, Medical Advantage Recruiters*
- "Ask whether the EHR is fully integrated with the virtual-care platform, where you're permitted to work from, and what the payment models are: is it hourly, salaried, per consult, or productivity based?" — *Joseph Kvedar, MD, American Telemedicine Association*

- "Make sure any organization you consider has an acceptable standard of care and that they're compliant with CMS [Centers for Medicare and Medicaid Services] rules and state regulations." — *Tyler Covey, MDstaffers*

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Physician Compensation Still Rising in Primary Care and Fast-Growing Urgent Care Sector, but Flattening Is Expected

Compensation is holding steady or rising, but the pandemic effects and practices' declining revenues will likely have an effect going forward

By Bonnie Darves

After a stellar run of rising compensation for primary care physicians (PCPs) for several years running, the news is that compensation is still going up — between 2.6% and 4.5% depending on the survey — even if there are clouds on the horizon. Demand has prompted the steady increases, approaching 10 percent overall between 2015 and 2019, and although that demand persists for primary care physicians (PCPs), there's an elephant in the room now that's likely to flatten compensation: the pandemic and its attendant effect on practice and hospital revenues.

"The question is, how do you create resiliency in an organization and retain the ability to keep paying rising compensation when revenues are going down? Unless you're Houdini, in this [financial] environment, you're going to be paying more and bringing in less revenue to cover operations," said Fred Horton, president of American Medical Group Association Consulting (AMGA Consulting). "That's the big challenge going forward: how to honor sustainable physician compensation to the possible detriment of the organization."

Even if PCP compensation flattens, the pay increases of recent years suggest that organizations recognize the value of primary care in the overall scheme of care delivery. In the AMGA 2020 Medical Group Compensation and Productivity Survey, based on 2019 data and including data from 317 primarily large groups, median compensation across the primary care specialties of family medicine, internal medicine, and pediatrics rose 4.5%. The breakdown across the primary care specialties was as follows:

AMGA—family medicine median compensation: $269,868, up from $260,108 in 2018

AMGA—internal medicine median compensation: $288,697, up from $273,254

AMGA—pediatrics and adolescent medicine median compensation: $257,432, up from $245,043

The Medical Group Management Association's annual Provider Compensation and Production Report, which included data from more than 168,000 physicians and nonphysician providers, found an average increase of 2.6% in primary care total compensation from 2018 to 2019, to $273,437. Here's that breakdown, from MGMA's 2020 *DataDive Provider Compensation Report:*

MGMA—family medicine average total compensation: $258,947, down slightly from $268,954 in 2018

MGMA—internal medicine average total compensation: $268,658, up from $258,323 in 2018

MGMA—pediatrics (general) average total compensation: $232,409, essentially flat compared with $232,701 in 2018

Although regional compensation variations are generally less pronounced than they were five or 10 years ago, because most organizations consider national data when setting their compensation structures, the MGMA survey did find some notable differences between the Eastern region (with a median of $257,757) compared to the other regions: $273,578 in the Midwest, $276,654 in the Southern region, and $279,626 in the Western region. "Compensation for primary care providers is pretty consistent across each of the regions," said Andrew Swanson, MBA, vice president of industry insights for MGMA. "The difference between the highest paying region (Western) compared to lowest paying region (Eastern) is just over $20,000."

The Medscape 2020 *Physician Compensation Report,* based on survey responses obtained from 17,000 physicians before the pandemic, found a 2.5% average increase in primary care compensation compared to 2019, from $237,000 to $245,000. In the breakdown, family medicine average compensation was $232,000, internal medicine $251,000, and pediatrics $232,000. Interestingly, 58 percent of PCPs surveyed reported receiving incentive bonuses over the year, at an average of $26,000.

Productivity mostly flat in primary care

The trend toward rising work relative value units (W-RVUs), the primary measure of how hard physicians work, appears to be leveling off. The MGMA's most recent survey found RVUs essentially unchanged from 2018 to 2019 across all primary care specialties. Median W-RVUs sector wide were 4,847 in 2019, a negligible difference of -0.27% from the previous year. The breakdown was 4,714 median W-RVUs in family medicine with obstetrics (and 4,936 without), 4,804 in internal medicine, and 4,879 in pediatrics.

The AMGA survey's findings were similar. Median W-RVUs came in at 4,740 in family medicine, 4,861 in internal medicine, and 5,246 in pediatrics. From a regional standpoint, W-RVUs were highest in the South and East (in both regions, median W-RVUs topped 5,000 in all three primary care specialties) and lower (below 5,000) in the West and North. The exception was pediatrics, where median RVUs were the highest of all the primary care specialties in all four regions, topping out at 5,676 in the South. "The West was highest in every metric, from total cash compensation to total RVUs," Mr. Horton said. "That's not surprising, really, because the region includes some of the highest cost-of-living ZIP codes in the country and that environment also has more capitation — covered lives and risk contracts — than the other regions. In addition, in many of those organizations, [physician] positions are salaried," Mr. Horton said.

As an indicator of overall primary care physician productivity to organizations' revenues, it's worth noting, Mr. Horton pointed out, that while compensation per W-RVU was up 2.6% in 2019, compared to the prior year, collections per RVU dropped by 1.6%. "This is the biggest gap that we saw in all of the specialties, which clearly puts some pressure on organizations going forward," he said.

The MGMA's survey found essentially the same trend: For most primary care specialties, compensation increases appear to be outpacing increases in productivity. "There have been concerns about physician shortages, which could be one explanation for higher compensation rates compared to productivity," said Andrew Swanson, MBA, vice president of industry insights for MGMA.

What was surprising in AMGA's findings, is that the long-expected significant shift from paying physicians on value rather than predominately on volume still isn't gaining much traction in the marketplace. In fact, the percentage of physician compensation paid out based on value actually declined slightly in 2019, to 7.6% from 7.8% in 2018. "There's been a lot of focus on getting more value in [physician care], but that shift is occurring more slowly than we anticipated," he said.

Gauging pandemic's effect on compensation

Although the MGMA declined to predict the effects of the pandemic and associated economic conditions and the drop in health care organizations' revenues effects on PCPs' (and other physicians') compensation in the next few years, citing fluctuating economic conditions, the organization

is following the situation closely. In MGMA's 2020 Monthly Survey, which captures compensation and productivity-level information on a monthly basis, preliminary findings showed dips in compensation in April and a slow rebounding in the following months. Not unexpectedly, the drops in provider productivity in April were much more significant than the drop in compensation, MGMA data analysts reported, and rebounding of productivity has been slower as well. Overall, according to MGMA's recent COVID-19 financial impact report, practices reported an average 55 percent decline in revenue in the early months of the pandemic and many were forced to furlough medical staff.

"COVID-19 has had a dramatic impact on the health care industry with productivity halting for many medical practices. Compensation models will look different in the near future based on shifting productivity and demands on physicians and the industry overall," said Halee Fischer-Wright, MD, MGMA's president and chief executive officer.

In a July 2020 Hospital Finance Podcast on the effects of the pandemic on physician compensation, Zachary Hartshell, a principal at SullivanCotter, which conducts annual surveys on physician compensation, reported that relatively few — less than 10 percent — of organizations surveyed had actually implemented wholesale furloughs or layoffs. Instead, SullivanCotter found that organizations making adjustments to address revenue declines were instead reducing compensation, shrinking benefit plans, or opting for temporary furloughs to ride out the drop in patient volumes.

Of course, it's not all doom and gloom out there, Mr. Horton reminds physicians. The pandemic will pass, organizations will always need skilled PCPs, and physicians will still command good incomes. He noted that the starting salaries for PCPs reported in the latest AMGA survey illustrate the high demand for physicians in that sector. Compared to 2018, starting compensation for internists was up 5.7%, and for family medicine physicians, 3.7%, and pediatricians, 5.1%. Even if the pandemic puts downward pressure on PCP compensation for a while, and organizations will have to adjust accordingly, he said, PCPs should be optimistic overall about their important role in health care delivery, regardless of economic conditions.

In the interim and going forward, to enable flexibility in physician pay structures, Mr. Horton urges organizations to set a component of compensation based on organizations' financial performance, and he strongly recommends that PCPs get involved in financial decision-making where they practice. "Physicians should focus on organizations that will include them in financial decision-making, not insulate them from financial reality," he said.

When they're considering primary care practice opportunities during this uncertain time, Mr. Horton added, physicians shouldn't be afraid to ask pointed questions about the organization's financial foundation and its ability and approach to weathering potentially significant upheaval, as the country experienced this year. "Physicians might ask, for example, what happened with patient volumes and how compensation was handled during the first wave of the pandemic and what the organization's compensation committee has planned in the event of another major disruption," Mr. Horton said.

Although PCP hiring also took a downturn in the wake of the pandemic, not surprisingly, there's a general sense that the overall hiring market remains strong because of the underlying factors, according to Merritt Hawkins, one of the country's largest physician recruiting firms. "The continued impact of COVID-19 makes looking into the future a difficult proposition. However, it's clear that most of the fundamental supply and demand factors driving compensation in primary care remain in place," said Tom Florence, an executive vice president at Merritt Hawkins. He cites the aging US population and high prevalence of chronic disease, as well as the growing need for preventive care that's been sidelined temporarily during the pandemic. "Sooner or later, a backlog of sick patients will need to be addressed. In the short term, COVID-19 reduced demand for primary care doctors and therefore inhibited salary offers, but the underlying factors that drive demand for primary care physicians remain intact," he said. "I think that primary care physicians can be optimistic that practice offers will remain abundant and compensation levels will hold."

Urgent care's boom spurs substantial compensation increases

One of the bright spots on the compensation horizon in recent years has been urgent care, a relatively new specialty that's seen a big increase in earnings as the model's prevalence grows. As health systems have newly implemented or expanded their urgent care presence and a slew of newcomer standalone organizations have entered the urgent care market, the specialty has become a darling of sorts in the health care sector. And that is increasing demand for those physicians and, in turn, higher compensation.

In the 2020 MGMA survey, urgent care physicians were No. 2 in terms of their compensation increase year over year, with a jump from a median of $259,661 in 2018 to $277,393 in 2019, a 6.83% increase. It's worth noting the urgent care physicians worked hard to get the pay hike, with an 8.26% in W-RVUs compared to the previous year. According to MGMA data analysts, the compensation and productivity increases, 15.44% from 2015 to 2019 (compensation) and 12.44% (W-RVUs) might be attributed primarily to market dynamics in recent years. "We've seen sizable increases in both physician compensation and productivity in urgent care, which could be indicative of its wider use," Mr. Swanson said.

The AMGA's survey found even higher compensation levels in urgent care. Median compensation came in at $295,605 in the 2020 survey, up from $283,787 in the 2019 survey — a substantial increase that occurred without an increase in W-RVUs, which remained flat at 4,895 in 2019. Since 2017, median urgent care compensation has increased by nearly $30,000, far more than for many other nonsurgical specialties.

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CLINICAL PRACTICE

Caren G. Solomon, M.D., M.P.H., *Editor*

Severe Covid-19

David A. Berlin, M.D., Roy M. Gulick, M.D., M.P.H., and Fernando J. Martinez, M.D.

This Journal *feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the authors' clinical recommendations.*

A 50-year-old, previously healthy man presents to the emergency department with 2 days of worsening dyspnea. He had fever, cough, and fatigue during the week before presentation. He appears acutely ill. The body temperature is 39.5°C (103°F), heart rate 110 beats per minute, respiratory rate 24 breaths per minute, and blood pressure 130/60 mm Hg. The oxygen saturation is 87% while the patient is breathing ambient air. The white-cell count is 7300 per microliter with lymphopenia. Chest radiography shows patchy bilateral opacities in the lung parenchyma. A reverse-transcriptase–polymerase-chain-reaction assay detects the presence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RNA in a nasopharyngeal swab. How would you evaluate and manage this case?

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THE CLINICAL PROBLEM

The most common initial symptoms of coronavirus disease 2019 (Covid-19) are cough, fever, fatigue, headache, myalgias, and diarrhea.[1] Severe illness usually begins approximately 1 week after the onset of symptoms. Dyspnea is the most common symptom of severe disease and is often accompanied by hypoxemia[2,3] (Fig. 1). Progressive respiratory failure develops in many patients with severe Covid-19 soon after the onset of dyspnea and hypoxemia. These patients commonly meet the criteria for the acute respiratory distress syndrome (ARDS), which is defined as the acute onset of bilateral infiltrates, severe hypoxemia, and lung edema that is not fully explained by cardiac failure or fluid overload.[4] The majority of patients with severe Covid-19 have lymphopenia,[5] and some have thromboembolic complications[6] as well as disorders of the central or peripheral nervous system.[7] Severe Covid-19 may also lead to acute cardiac, kidney, and liver injury, in addition to cardiac arrhythmias, rhabdomyolysis, coagulopathy, and shock.[8,9] These organ failures may be associated with clinical and laboratory signs of inflammation, including high fevers, thrombocytopenia, hyperferritinemia, and elevations in C-reactive protein and interleukin-6.[10]

The diagnosis of Covid-19 can be established on the basis of a suggestive clinical history and the detection of SARS-CoV-2 RNA in respiratory secretions. Chest radiography should be performed and commonly shows bilateral consolidations or ground-glass opacities[11] (Fig. 2).

For epidemiologic purposes, severe Covid-19 in adults is defined as dyspnea, a respiratory rate of 30 or more breaths per minute, a blood oxygen saturation of 93% or less, a ratio of the partial pressure of arterial oxygen to the fraction of inspired oxygen (Pao_2:Fio_2) of less than 300 mm Hg, or infiltrates in more than 50%

An audio version of this article is available at NEJM.org

KEY CLINICAL POINTS

EVALUATION AND MANAGEMENT OF SEVERE COVID-19

- Patients with severe coronavirus disease 2019 (Covid-19) may become critically ill with acute respiratory distress syndrome that typically begins approximately 1 week after the onset of symptoms.
- Deciding when a patient with severe Covid-19 should receive endotracheal intubation is an essential component of care.
- After intubation, patients should receive lung-protective ventilation with plateau pressure less than or equal to 30 cm of water and with tidal volumes based on the patient's height.
- Prone positioning is a potential treatment strategy for refractory hypoxemia.
- Thrombosis and renal failure are well-recognized complications of severe Covid-19.
- Dexamethasone has been shown to reduce mortality among hospitalized patients with Covid-19 who require oxygen, particularly those receiving mechanical ventilation.
- Remdesivir was recently approved by the Food and Drug Administration for the treatment of Covid-19 in hospitalized patients, on the basis of randomized trials showing that the drug reduces time to clinical recovery; however, more data are needed to inform its role in treating severe Covid-19.

of the lung field.[12] In a large cohort of symptomatic patients with Covid-19 described early in the pandemic, 81% had mild disease, 14% had severe disease, and 5% became critically ill with organ failure; the mortality in the critically ill group was 49%.[12]

Healthy persons of any age may become critically ill with Covid-19. However, age is the most important risk factor for death or critical illness, and the risk increases with each additional decade.[13] People with chronic health conditions such as cardiovascular disease, diabetes mellitus, immunosuppression, and obesity are more likely to become critically ill from Covid-19. Severe disease is more common among men than among women. The risk is also increased among certain racial and ethnic groups such as Black and Hispanic persons in the United States.[14] The social determinants of health probably have a strong influence on the risk of severe disease.[13] A hallmark of the Covid-19 pandemic is the sudden appearance of an unprecedented number of critically ill patients in a small geographic area.[12] This can overwhelm local health care resources, resulting in shortages of trained staff, ventilators, renal-replacement therapy, and intensive care unit beds.

STRATEGIES

INITIAL STEPS

Patients with severe Covid-19 should be hospitalized for careful monitoring. Given the high risk of nosocomial spread,[3] strict infection-control procedures are needed at all times. If able, the patient should wear a surgical mask to limit the dispersion of infectious droplets.[15] Clinicians should don appropriate personal protective equipment (PPE) as defined by their local infection-prevention program, using particular caution when performing procedures that may increase the generation or dispersion of infectious aerosols. These include endotracheal intubation, extubation, bronchoscopy, airway suctioning, nebulization of medication, the use of high-flow nasal cannulae, noninvasive ventilation, and manual ventilation with a bag-mask device.[16] Current guidelines recommend that clinicians wear gowns, gloves, N95 masks, and eye protection at the least and place patients in negative-pressure rooms whenever possible during aerosol-generating procedures.[17]

Patients with severe Covid-19 have a substantial risk of prolonged critical illness and death. Therefore, at the earliest opportunity, clinicians should partner with patients by reviewing advanced directives, identifying surrogate medical decision makers, and establishing appropriate goals of care. Because infection-control measures during the pandemic may prevent families from visiting seriously ill patients, care teams should develop plans to communicate with patients' families and surrogate decision makers.

BASICS OF RESPIRATORY CARE

Patients should be monitored carefully by direct observation and pulse oximetry. Oxygen should be supplemented by the use of a nasal cannula or Venturi mask to keep the oxygen saturation of hemoglobin between 90 and 96%.[17] Deciding whether or not to intubate is a critical aspect of caring for seriously ill patients with Covid-19. Clinicians must weigh the risks of premature

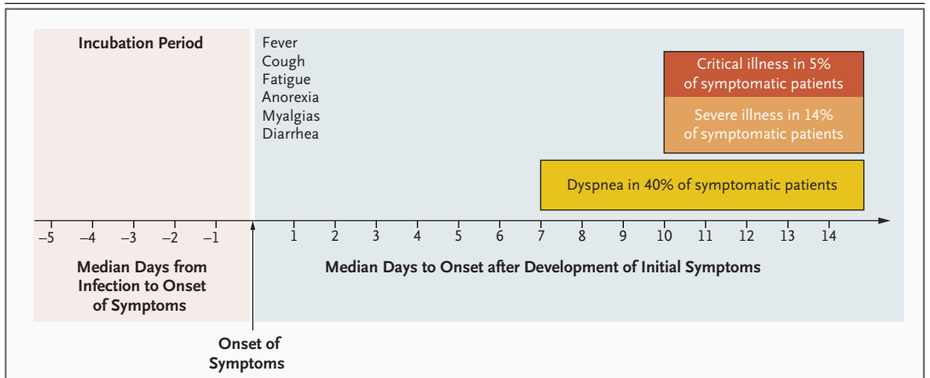

Figure 1. Timeline of Symptoms of Severe Coronavirus Disease 2019 (Covid-19).

The left border of the colored boxes shows the median time to onset of symptoms and complications. There is wide variation in the duration of symptoms and complications. Adapted from Zhou et al.[2] and the Centers for Disease Control and Prevention.[1]

intubation against the risk of sudden respiratory arrest with a chaotic emergency intubation, which exposes staff to a greater risk of infection. Signs of excessive effort in breathing, hypoxemia that is refractory to oxygen supplementation, and encephalopathy herald impending respiratory arrest and the need for urgent endotracheal intubation and mechanical ventilation. There is no single number or algorithm that determines the need for intubation, and clinicians must consider a variety of factors (Fig. 3A).

If the patient does not require intubation but remains hypoxemic, a high-flow nasal cannula can improve oxygenation and may prevent intubation in selected patients.[17,18] The use of noninvasive positive-pressure ventilation should probably be restricted to patients with Covid-19 who have respiratory insufficiency due to chronic obstructive pulmonary disease, cardiogenic pulmonary edema, or obstructive sleep apnea rather than ARDS. Patients treated with a high-flow nasal cannula or noninvasive ventilation require careful monitoring for deterioration that would indicate the need for invasive mechanical ventilation.[18]

Having awake patients turn to the prone position while they breathe high concentrations of supplemental oxygen may improve oxygenation in patients with severe Covid-19. This approach is supported by data from prospective cohorts describing its use in nonintubated patients with severe hypoxemia.[19] However, whether prone positioning can prevent intubation in patients with severe Covid-19 is unclear. Because it is difficult to provide rescue ventilation to patients who are prone, this position should be avoided in patients whose condition is rapidly deteriorating.

ENDOTRACHEAL INTUBATION

A skilled operator should perform endotracheal intubation in patients with severe Covid-19. The use of unfamiliar PPE, the risk of infection to staff, and the presence of severe hypoxemia in patients all increase the difficulty of intubation. If possible, intubation should be performed after preoxygenation and rapid-sequence induction of sedation and neuromuscular blockade. An antiviral filter should be placed in line with the airway circuit at all times. Video laryngoscopy may allow the operator to have a good view of the airway from a greater distance.[20] However, operators should choose the technique that is most likely to be successful on the first attempt. Continuous-wave capnography is the best method to confirm tracheal intubation.[20] Patients with severe Covid-19 often become hypotensive soon after intubation owing to positive-pressure ventilation and systemic vasodilation from sedatives.[20] Therefore, intravenous fluids and vasopressors should be immediately available at the time of intubation, and careful hemodynamic monitoring is essential.[20]

VENTILATOR MANAGEMENT

It is unclear whether Covid-19 is associated with a distinct form of ARDS that would benefit from

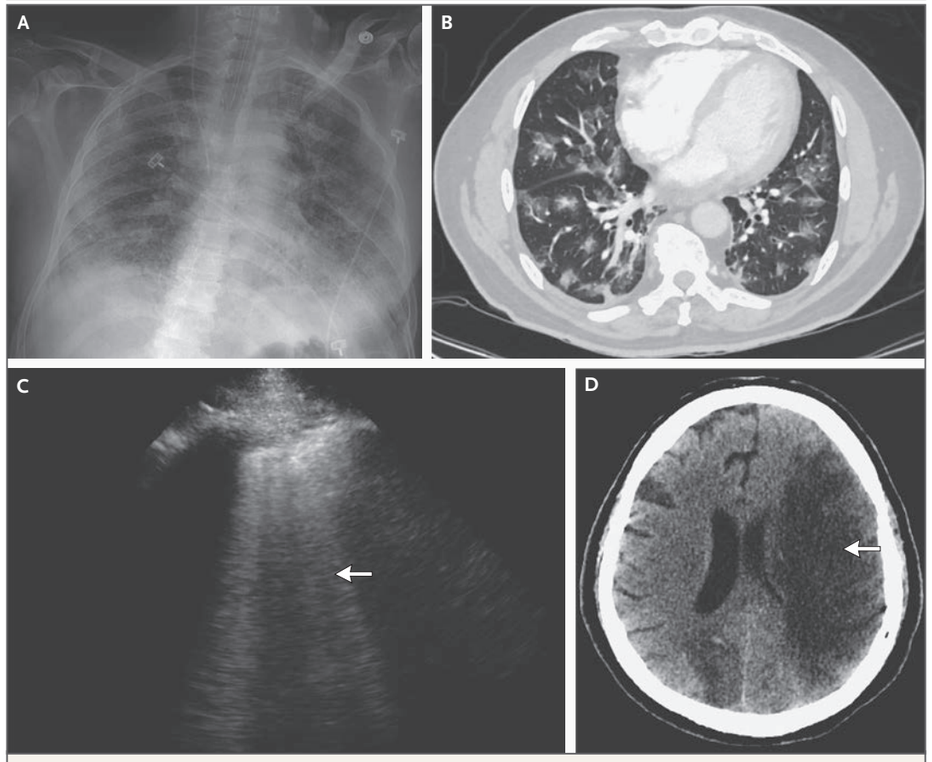

Figure 2. Radiographic and Ultrasonographic Findings of Severe Covid-19.

Chest radiography (Panel A) shows bilateral ground-glass opacities and consolidations. Computed tomography (CT) of the chest (Panel B) shows bilateral ground-glass opacities. Thoracic ultrasonography (Panel C) shows B lines (arrow); this image is courtesy of Dr. Christopher Parkhurst. CT of the head (Panel D) shows left-greater-than-right cerebral infarcts (arrow).

a new strategy of mechanical ventilation. However, most autopsies performed on patients with severe Covid-19 reveal the presence of diffuse alveolar damage, which is the hallmark of ARDS.[21] Moreover, respiratory-system compliance and gas exchange in patients with respiratory failure from severe Covid-19 are similar to those in populations enrolled in previous therapeutic trials for ARDS.[22] Therefore, clinicians should follow the treatment paradigm developed during the past two decades for ARDS (Fig. 3B).[17,18] This strategy aims to prevent ventilator-induced lung injury by avoiding alveolar overdistention, hyperoxia, and cyclical alveolar collapse.

To prevent alveolar overdistention, clinicians should limit both the tidal volume delivered by the ventilator and the maximum pressure in the alveoli at the end of inspiration. To do this, clinicians should set the ventilator to deliver a tidal volume of 6 ml per kilogram of predicted body weight; this approach is termed "lung-protective ventilation." A tidal volume up to 8 ml per kilogram of predicted body weight is allowed if the patient becomes distressed and attempts to take larger tidal volumes. A few times each day, clinicians should initiate a half-second end-inspiratory pause, which allows the pressure in the airway circuit to equilibrate between the patient and the ventilator. The pressure in the airway circuit at the end of the pause — "the plateau pressure" — approximates the alveolar pressure (relative

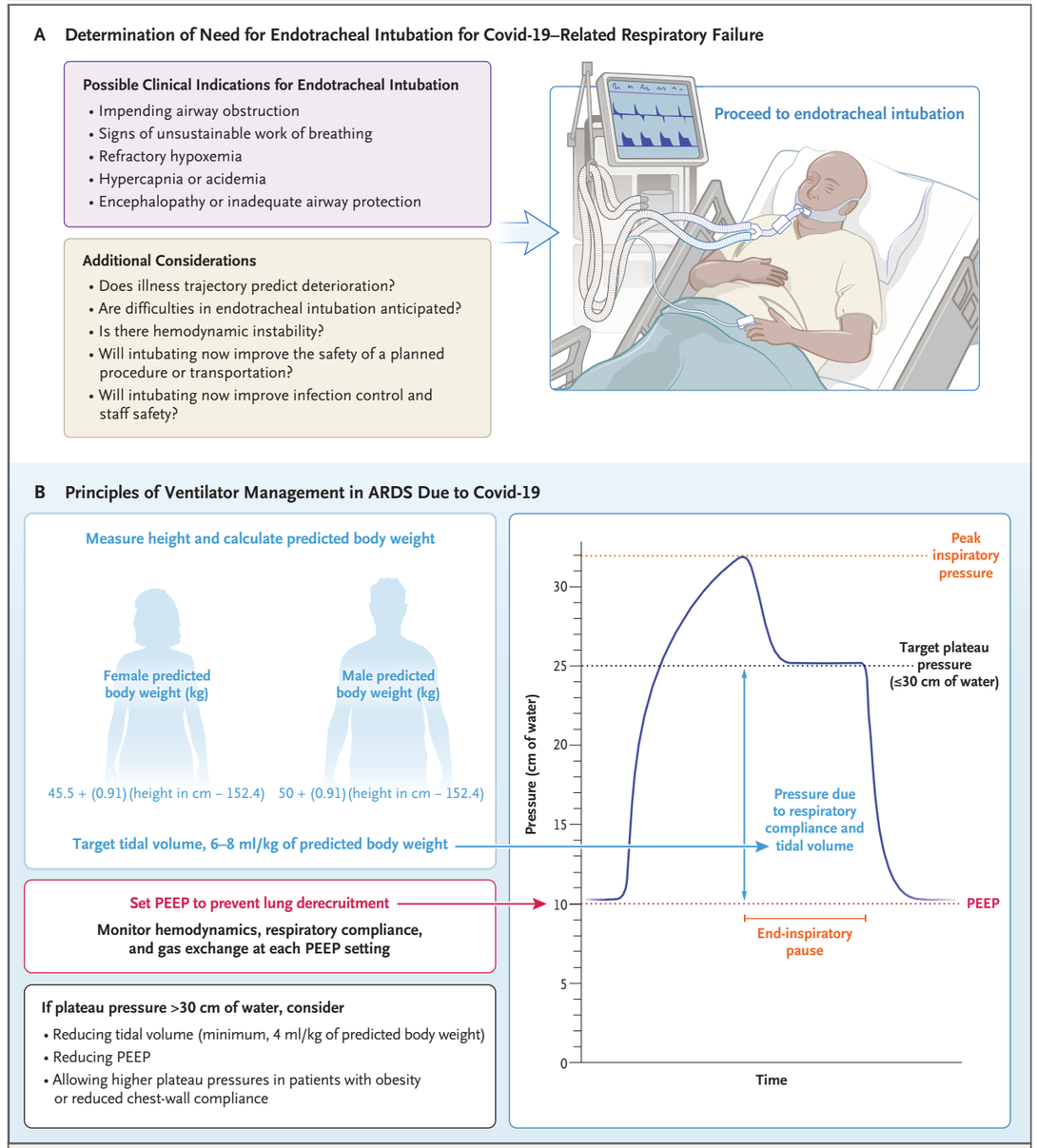

Figure 3. Invasive Mechanical Ventilation for Covid-19–Related Respiratory Failure.

As shown in Panel A, a life-threatening problem in the purple box or a combination of less severe problems in the purple and tan boxes determines the need for endotracheal intubation. In Panel B, "lung derecruitment" refers to the collapse of alveoli. All pressures are measured in the ventilator circuit and referenced to atmospheric pressure. ARDS denotes acute respiratory distress syndrome, and PEEP positive end-expiratory pressure.

to atmospheric pressure). To prevent alveolar overdistention, the plateau pressure should not exceed 30 cm of water.[23] A higher plateau pressure without the development of ventilator-induced lung injury may be possible in patients with central obesity or noncompliant chest walls.

For patients with Covid-19–related ARDS, setting sufficient positive end-expiratory pressure (PEEP) on the ventilator may prevent alveolar collapse and facilitate the recruitment of unstable lung regions. As a result, PEEP can improve respiratory-system compliance and allow for a reduction in the F_{IO_2}. However, PEEP can reduce venous return to the heart and cause hemodynamic instability. Moreover, excessive PEEP can lead to alveolar overdistention and reduce respiratory-system compliance. No particular method of determining the appropriate level of PEEP has been shown to be superior to other methods.[17]

Sedatives and analgesics should be targeted to prevent pain, distress, and dyspnea. They can also be used to blunt the patient's respiratory drive, which improves patient synchrony with mechanical ventilation. Sedation is especially important in febrile patients with high metabolic rates who are treated with lung-protective ventilation. Neuromuscular blocking agents can be used in deeply sedated patients who continue to use their accessory muscles of ventilation and have refractory hypoxemia.[17] These agents can reduce the work of breathing, which reduces oxygen consumption and carbon dioxide production.[24] Moreover, sedatives and neuromuscular blocking agents may help reduce the risk of lung injury that may occur when patients generate strong spontaneous respiratory efforts.

REFRACTORY HYPOXEMIA

Clinicians should consider prone positioning during mechanical ventilation in patients with refractory hypoxemia (P_{aO_2}:F_{IO_2} of <150 mm Hg during respiration and F_{IO_2} of 0.6 despite appropriate PEEP). In randomized trials involving intubated patients with ARDS (not associated with Covid-19), placing the patient in the prone position for 16 hours per day has improved oxygenation and reduced mortality.[18,25] However, prone positioning of patients requires a team of at least three trained clinicians, all of whom require full PPE.[17] Inhaled pulmonary vasodilators (e.g., inhaled nitric oxide) can also improve oxygenation in refractory respiratory failure, although they do not improve survival in ARDS not associated with Covid-19.[17] Extracorporeal membrane oxygenation (ECMO) is a potential rescue strategy in patients with refractory respiratory failure. Clinicians should carefully balance possible benefits with risks (e.g., bleeding) as well as the resources available during the pandemic.[26]

THERAPY

A large, randomized clinical trial involving more than 6400 hospitalized patients with Covid-19 showed that dexamethasone significantly reduced 30-day mortality (17% reduction); benefit was limited to patients who required oxygen supplementation and appeared greater in patients receiving mechanical ventilation.[27] Consequently, dexamethasone (or potentially other glucocorticoids) is now considered the standard of care for patients with severe Covid-19.

Data from a randomized, placebo-controlled trial involving more than 1000 patients with severe Covid-19 showed that the antiviral agent remdesivir reduced time to clinical recovery; the benefit appeared greatest in patients who were receiving supplemental oxygen but were not intubated.[28] The 29-day mortality in that trial was 11.4% with remdesivir and 15.2% with placebo (hazard ratio for death, 0.73; 95% confidence interval, 0.52 to 1.03). These data support the Food and Drug Administration (FDA) approval of remdesivir for the treatment of hospitalized patients with Covid-19 in October 2020. Recent preliminary results of a large, multinational, open-label, randomized trial did not show a reduction in in-hospital mortality with use of remdesivir.[29] The combination of dexamethasone and remdesivir is increasingly used clinically, but its benefit has not been shown in randomized clinical trials. Tocilizumab, an interleukin-6 inhibitor, did not significantly reduce disease progression[30] or death in small randomized trials involving patients with severe Covid-19.[31,32]

SUPPORTIVE CARE

Patients with Covid-19 often present with volume depletion and receive isotonic-fluid resuscitation. Volume repletion helps maintain blood pressure and cardiac output during intubation and positive-pressure ventilation. After the first few days of mechanical ventilation, the goal should be to avoid hypervolemia.[33] Fever and tachypnea in patients with severe Covid-19 often increase insensible water loss, and careful attention must be paid to water balance. If the patient is hypotensive, the dose of vasopressor can be adjusted to maintain a mean arterial pressure of 60 to 65 mm Hg.[17] Norepinephrine is the preferred vasopressor. The presence of unexplained hemodynamic instability should prompt consideration of myocardial ischemia, myocarditis, or pulmonary embolism.

In case series, approximately 5% of patients with severe Covid-19 have received renal-replacement therapy[34]; the pathophysiology of the renal failure is currently unclear but is probably multifactorial. Because blood clotting in the circuit is common in patients with severe Covid-19,[6] the efficacy of continuous renal-replacement therapy is uncertain.

Abnormalities of the clotting cascade, such as thrombocytopenia and elevation of D-dimer levels, are common in patients with severe Covid-19 and are associated with increased mortality.[3] If there are no contraindications, patients should receive standard thromboprophylaxis (e.g., subcutaneous low-molecular-weight heparin).[35] Some case series of patients with severe Covid-19 have shown clinically significant thrombosis despite the use of thromboprophylaxis.[6] However, the benefits and risks of the routine use of more intense prophylactic anticoagulation in patients are unknown.[35]

Patients hospitalized with severe Covid-19 are often treated empirically with antibiotics.[3,9] However, bacterial coinfection is rare when immunocompetent patients first present to the hospital.[36] Antibiotics can be discontinued after a short course if signs of bacterial coinfection, such as leukocytosis and focal pulmonary infiltrates, are absent.[18] Although Covid-19 itself can cause prolonged fever,[2] clinicians should be vigilant for nosocomial infections.

Performing cardiopulmonary resuscitation in patients with Covid-19 may expose health care workers to infectious droplets and aerosols. Therefore, all the members of the resuscitation team should wear appropriate PPE before performing rescue ventilation, chest compressions, or defibrillation.[37]

Patients with Covid-19 who are receiving mechanical ventilation should receive appropriate nutrition and care to prevent constipation and injury to the skin and corneas. If the condition of a patient has stabilized, clinicians should attempt to withhold continuous sedation each day.[38] Daily awakening may be challenging because an increase in the work of breathing and the loss of synchrony with mechanical ventilation may result in distress and hypoxemia.

During the Covid-19 pandemic, an overwhelming surge of patients presenting to a hospital may temporarily require the rationing of health care resources. Local guidelines and medical ethics consultation can help clinicians navigate these difficult decisions with patients and their families.

AREAS OF UNCERTAINTY

Despite FDA approval of remdesivir for hospitalized patients with Covid-19, more data are needed to inform the role of this drug in severe Covid-19. Numerous randomized trials of many other candidate therapies, including antivirals, antibodies, and immunomodulating agents, are ongoing (Table 1).

Despite observational studies suggesting benefit of interleukin-6 inhibitors,[53,54] small, randomized clinical trials failed to show consistent benefit.[30-32] Other immunomodulating agents currently being evaluated for severe Covid-19 include passive immunotherapy with convalescent plasma, monoclonal antibodies, immunoglobulins, and interleukin-1 pathway inhibitors.[55] Pending final results of randomized trials, the risks and benefits of these approaches are also unknown. Candidate therapies for Covid-19 warrant evaluation separately in patients with established severe disease and in those with milder illness to determine whether they reduce the risk of progression to severe disease.

GUIDELINES

The recommendations in this article are largely concordant with the guidelines for severe Covid-19 from the American Thoracic Society, the Infectious Diseases Society of America, the National Institutes of Health, and the Surviving Sepsis Campaign.[17,18,56,57]

CONCLUSIONS AND RECOMMENDATIONS

For the patient described in the vignette, an important aspect of care is careful monitoring of

Table 1. Selected Candidate Therapies for Coronavirus Disease 2019 (Covid-19).*

Class	Availability	Rationale	Clinical Data
Antiviral agents			
Hydroxychloroquine	FDA-approved for lupus, malaria, rheumatoid arthritis; FDA emergency-use authorization for certain hospitalized patients with Covid-19 was revoked	In vitro activity against SARS-CoV-2[39]	Randomized, controlled trials showed no benefit in hospitalized patients[40,41]
Lopinavir–ritonavir	FDA-approved for HIV infection	In vitro activity against SARS-CoV-2[42]	Randomized, controlled trials showed no benefit in hospitalized patients[43,44]
Remdesivir	FDA-approved for hospitalized patients with Covid-19	In vitro activity against SARS-CoV-2[42,45]	Randomized, placebo-controlled trials showed faster time to recovery with remdesivir in hospitalized patients[28,46]; preliminary results from a large, multinational, open-label randomized trial showed no mortality benefit[29]
Antibodies			
Convalescent plasma	Investigational; FDA emergency-use authorization for hospitalized patients with Covid-19	Use in other viral illnesses, including H1N1 influenza, SARS, and MERS	Small, uncontrolled cohort studies suggested benefit[47,48]; small randomized, controlled trials did not suggest benefit[49,50]; large uncontrolled study showed preliminary safety[51]; additional randomized, controlled trials in progress
Monoclonal antibodies	Investigational; FDA emergency-use authorization for nonhospitalized patients with Covid-19	Use in other viral illnesses, including Ebola and HIV	One randomized clinical trial showed that a single dose of bamlanivimab (LY-CoV555) reduced viral load in outpatients with Covid-19[52]; role in inpatients unclear
Immune-based agents			
BTK inhibitors (acalabrutinib, ibrutinib, rilzabrutinib)	FDA-approved for some hematologic cancers	Immunomodulation-targeting cytokines	Clinical trials in progress
Dexamethasone (and other glucocorticoids)	FDA-approved for multiple indications	Broad immunomodulation	Large randomized, controlled trial showed mortality benefit with dexamethasone in hospitalized patients requiring oxygen[27]
Interleukin-1 inhibitors (anakinra, canakinumab)	FDA-approved for some autoimmune diseases	Immunomodulation; activity in macrophage activation syndrome	Clinical trials in progress
Interleukin-6 inhibitors (sarilumab, siltuximab, tocilizumab)	FDA-approved for some autoimmune diseases and cytokine release syndrome (tocilizumab)	Immunomodulation; activity in cytokine release syndrome	Small randomized, controlled trials have not shown benefit[30-32]; additional clinical trials in progress
JAK inhibitors (baricitinib, ruxolitinib)	FDA-approved for rheumatoid arthritis (baricitinib) and myelofibrosis and polycythemia vera (ruxolitinib); FDA emergency-use authorization for baricitinib in combination with remdesivir for hospitalized patients with Covid-19 requiring oxygen	Broad immunomodulation	Clinical trials in progress

* Selected references are provided for rationale and clinical data. ARDS denotes acute respiratory distress syndrome, BTK Bruton's tyrosine kinase, FDA Food and Drug Administration, HIV human immunodeficiency virus, IND investigational new drug, JAK Janus kinase, MERS Middle East respiratory syndrome, SARS severe acute respiratory syndrome, and SARS-CoV-2 severe acute respiratory syndrome coronavirus 2.

his respiratory status to determine whether endotracheal intubation is appropriate. If mechanical ventilation is initiated, the clinician should adhere to a lung-protective ventilation strategy by limiting the plateau pressure and tidal volumes. Deep sedation with neuromuscular blocking agents and prone positioning should be considered if refractory hypoxemia develops. Prophylactic anticoagulants should be administered to prevent thrombosis. Dexamethasone should be started, because data from a randomized clinical trial show a reduction in mortality. Although more data are needed to inform benefits of treatment with both remdesivir and dexamethasone, we would also give remdesivir given its antiviral mechanism of action and data from randomized clinical trials showing that it shortens time to clinical recovery. Rigorous adherence to infection-control practices is essential at all times. Given the high risk of complications from severe Covid-19, clinicians should work with patients and families to establish appropriate goals of care at the earliest possible time.

Given the uncertainties regarding effective treatment, clinicians should discuss available clinical trials with patients. In addition, clinicians should discuss the value of autopsies with the families of patients who do not survive.

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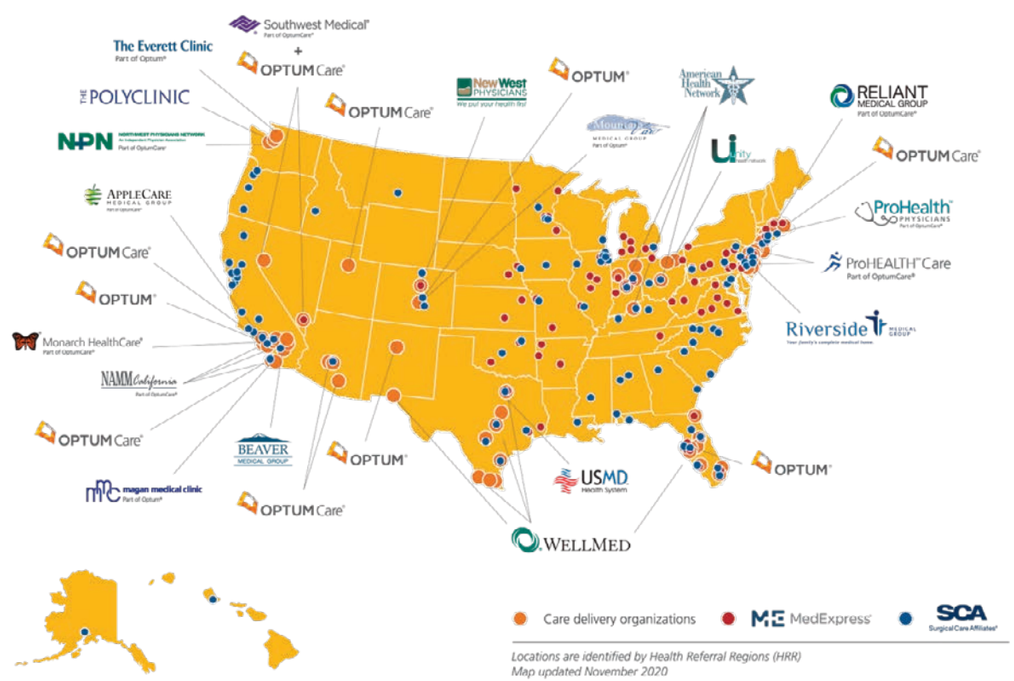

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How to Advertise

All orders, cancellations, and changes must be received in writing. E-mail your advertisement to us at ads@nejmcareercenter.org, or fax it to 1-781-895-1045 or 1-781-893-5003. We will contact you to confirm your order. Our closing date is typically the Friday 20 days prior to publication date; however, please consult the rate card online at **nejmcareercenter.org** or contact the Classified Advertising Department at 1-800-635-6991. Be sure to tell us the classification heading you would like your ad to appear under (see listings above). If no classification is offered, we will determine the most appropriate classification. Cancellations must be made 20 days prior to publication date. Send all advertisements to the address listed below.

Contact Information

Classified Advertising
The New England Journal of Medicine
860 Winter Street, Waltham, MA 02451-1412

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How to Calculate the Cost of Your Ad

We define a word as one or more letters bound by spaces. Following are some typical examples:

Bradley S. Smith III, MD.....	= 5 words
Send CV	= 2 words
December 10, 2007	= 3 words
617-555-1234	= 1 word
Obstetrician/Gynecologist ...	= 1 word
A	= 1 word
Dalton, MD 01622	= 3 words

As a further example, here is a typical ad and how the pricing for each insertion is calculated:

MEDICAL DIRECTOR — A dynamic, growth-oriented home health care company is looking for a full-time Medical Director in greater New York. Ideal candidate should be board certified in internal medicine with subspecialties in oncology or gastroenterology. Willing to visit patients at home. Good verbal and written skills required. Attractive salary and benefits. Send CV to: E-mail address.

This advertisement is 56 words. At $9.95 per word, it equals $557.20. This ad would be placed under the Chiefs/Directors/ Department Heads classification.

Classified Ads Online

Advertisers may choose to have their classified line and display advertisements placed on NEJM CareerCenter for a fee. The web fee for line ads is $120.00 per issue per advertisement and $200.00 per issue per advertisement for display ads. The ads will run online two weeks prior to their appearance in print and one week after. For online-only recruitment advertising, please visit nejmcareercenter.org for more information, or call 1-800-635-6991.

Policy on Recruitment Ads

All advertisements for employment must be non-discriminatory and comply with all applicable laws and regulations. Ads that discriminate against applicants based on sex, age, race, religion, marital status or physical handicap will not be accepted. Although the *New England Journal of Medicine* believes the classified advertisements published within these pages to be from reputable sources, NEJM does not investigate the offers made and assumes no responsibility concerning them. NEJM strives for complete accuracy when entering classified advertisements; however, NEJM cannot accept responsibility for typographical errors should they occur.

Classified Ad Deadlines

Issue	Closing Date
March 25	March 5
April 1	March 12
April 8	March 19
April 15	March 26

Anesthesiology

PHYSICIAN: ANESTHESIOLOGIST (MULTIPLE OPENINGS) — Full-time position working for Narragansett Bay Anesthesia, LLC. Providing services at Roger Williams Medical Center in Providence, RI; Kent County Memorial Hospital in Warwick, RI; and Our Lady of Fatima Hospital in North Providence, RI. May also provide services at West River Endoscopy in Providence, RI; Blackstone Valley Surgicare in Johnston, RI; Ortho RI in Warwick, RI; and East Bay Surgery Center in Swansea, MA. Requirements include BE in Anesthesiology. Send resume to: Vijay Sudheendra, MD, President, 690 Canton Street, Suite 325, Westwood, MA 02090 or by e-mail to: vsudheendr@mac.com

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Gastroenterology

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Hospitalist

HOSPITALISTS (MULTIPLE POSITIONS) — New England Inpatient Specialists LLC (Multiple positions for day and night shifts are required at: Lowell, MA; Winchester, MA; Newburyport, MA): Under the supervision of the medical director, the Hospitalist will provide coverage to an acute care hospital; examine, diagnose, and treat patients, prescribe medication, and utilize medical equipment as needed. Minimum Requirements: MD or foreign equivalent, eligible for MA Medical Licensure, and BC/BE in Internal Medicine. To apply, send CV and cover letter to: jhanson@neisp.com w/ ref to job code AGAM21.

HOSPITALIST POSITION — Position available in tertiary care center in Metro Detroit. H1-B Visa accepted. E-mail CV to: Iulniculescu@yahoo.com

Infectious Disease

INFECTIOUS DISEASE — BC/BE Internist specializing in Infectious Disease to establish a practice and/or associate with an established, busy, expanding practice in northwest Indiana. Sphere of practice is approximately 30 minutes from downtown Chicago. Guaranteed excellent starting salary with progressive growth leading to partnership. Enclose CV to: Infectious Disease Specialists, PC, PO Box 597, Schererville, IN 46375 or e-mail to: idscredentialing@gmail.com

Internal Medicine (see also FM and Primary Care)

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Graduate Training/ Residency Programs (see also Related Specialties)

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Human Resource Specialist via email
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- **Gastroenterology**
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- **Neurology**
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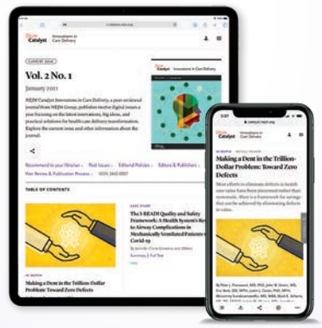

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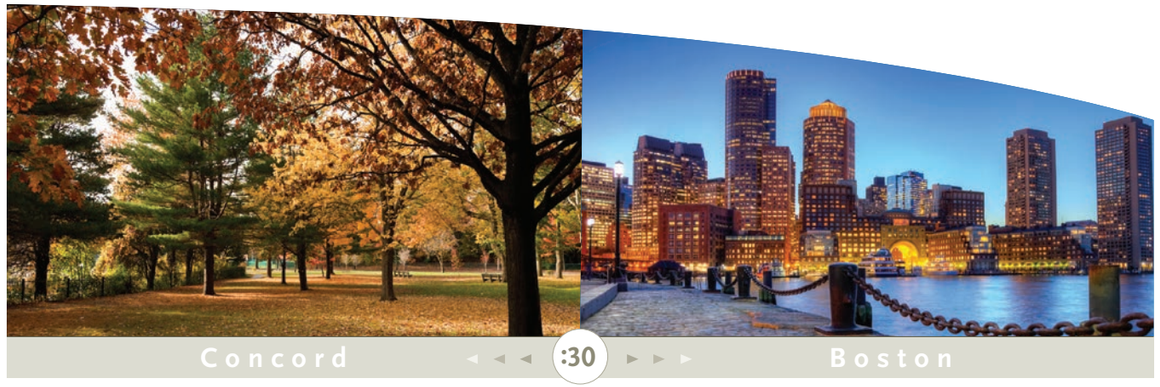

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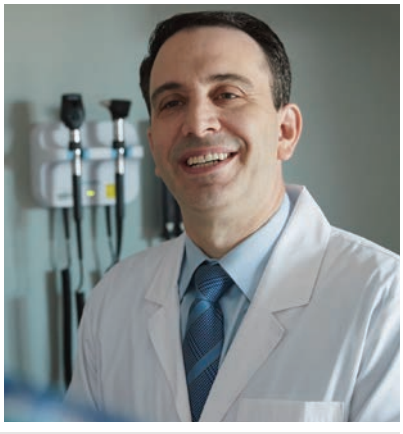
OPTUM®

The team you're on can shape the impact you have.



Help us bring new ideas and greater levels of performance to your community.

At Optum Care, we put the physician at the center of care and reward them for spending more time with each patient. We're at the forefront of value-based care and are building our physician-led, evidence-based practice model by integrating care teams and giving them the support, tools and resources needed to keep patients healthy.

Already the nation's largest employer of physicians, Optum is committed to overall population health. Our deep analytical capabilities and health information system technology enable better decision-making at every point along the care continuum.

The future of medicine at Optum, the fastest-growing part of the UnitedHealth Group family of businesses, will be built through a combination of innovative thinking and deep compassion. Join us in defining that future and start doing **your life's best work.**[SM]

Explore opportunities across specialties nationwide: optum.co/nejm

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