

Putting Information on Our Side:

A Guide for Hospitals Battling COVID-19

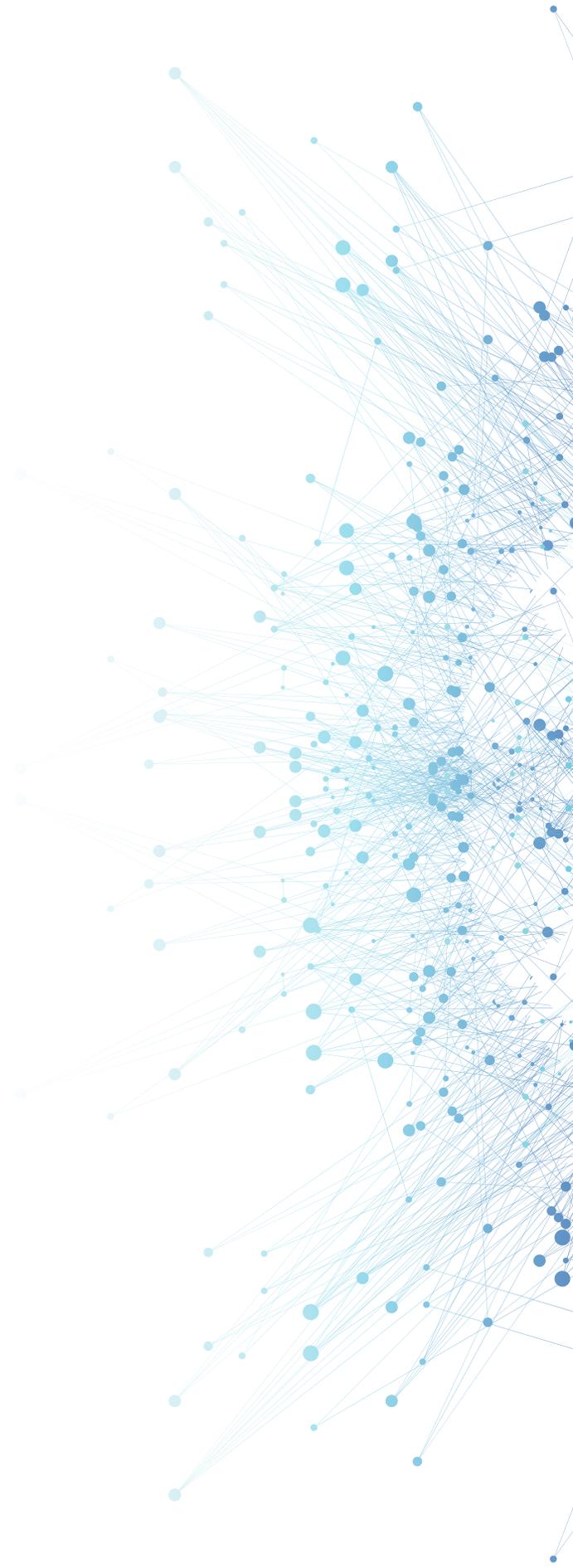
Putting Information on Our Side:

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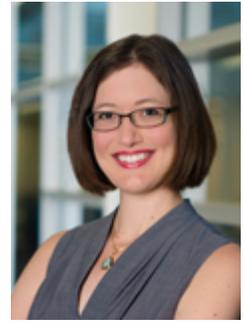
From Medical Informatics Corp. (MIC)

Reducing provider exposure and rapidly expanding ICU bed capacity during the COVID-19 Pandemic, a helpful guide for:

- CEOs and other C-suite hospital executives, including CIOs, CMOs, CNOs, CMIOs and CNIOs
- Medical Directors of all Critical Care Units - ICU, NICU, PICU, Neurology, Neonatology, and Anesthesiology
- Nurse Managers of Critical Care Units
- Telemetry Nurse Managers
- Quality Managers
- Alarm Management Committee Lead
- Directors of Biomed
- IT Managers
- Informaticists



Message from the CEO



There is still so much that medicine doesn't yet know about the deadly new coronavirus, COVID-19, but there are two things known for sure. First, patient conditions are presenting far differently from anything providers have seen before, often not responding to traditional courses of treatment. Second, healthcare providers are on the front lines, running toward the line of fire, sacrificing their health — all to save as many lives as possible. As we all band together to solve for this pandemic, it's time to look for creative ways to protect healthcare workers without sacrificing quality of care.

We've been working directly with critical care teams over the past 10 years and know far too well that when it comes to critical care, mere seconds make a difference — it's in that narrow slice of time when the most critical decisions often have to be made. This is especially true during this pandemic.

We have always been committed to helping support these teams by giving them the data they need to save lives. We are even more committed to this effort now, during the pandemic, when it is more important than ever that technology steps up to provide these brave men and women with possibilities that haven't yet existed, but do now.

It's time to put technology and information to work. It's time to band together so we can help save lives — lives of patients and the healthcare workers trying to save them.

We wrote this guide as a resource to help you navigate some of the key issues you may want to consider when trying to protect providers from risk and continue to deliver high-quality care. My team, our partners, and I are all personally working to help during these challenging times.

We are so grateful to all of you for your sacrifice during this time. Please do not hesitate to reach out if there is anything we can do to help.

Sincerely,

Emma Fauss
CEO, MIC

Components of This Guide:

- I. Clinical Distancing: Protecting Providers During this Pandemic
- II. Remote Monitoring & Device Integration
- III. Software-based Virtual ICUs Enable Rapid Scaling
- IV. Augmenting Decision-making with Complete Retrospective Data & Patient-specific Analytics
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Clinical Distancing: Protecting Providers During This Pandemic

By now, you are familiar with the term “social distancing,” in which Americans are doing what they can to limit the spread of COVID-19 by staying at least six feet apart from each other in public, and staying home whenever possible. It’s an important way that everyone can help reduce the patient load on the healthcare system at once to “flatten the curve” by limiting transmission and, thus, the number of severe cases that require hospitalization and overwhelm the system.

Healthcare providers, too, are trying to keep from catching the virus while also treating those who may have it. From remote monitoring and telehealth services to PPE, drive-through testing, and other procedures, the new phrase we have coined for these proactive measures to help protect clinicians from risk is “clinical distancing.”

It’s important to consider that beyond beds, ventilators, and prescription therapies, the most valuable asset that healthcare has to offer patients is the experience and dedication of its trained clinicians. The men and women who have spent years saving patients from death are among those who are most crucial now.

In the smart and responsible usage of resources, it’s incumbent upon hospitals and healthcare systems to

find ways to use clinical distancing to protect their staff. Whenever possible, virtual ICUs, virtual rounding, and other telemedicine solutions should be employed to expose as few staff members as possible to this highly contagious virus. Considerable thought should be given to who interfaces with all patients – those with and without symptoms of COVID-19 – where, when and how.

As an industry, and as healthcare systems, hospitals, and senior leaders, we need to use technology smartly to protect our providers from also becoming ill or spreading the virus to their own families.

Keep in mind:

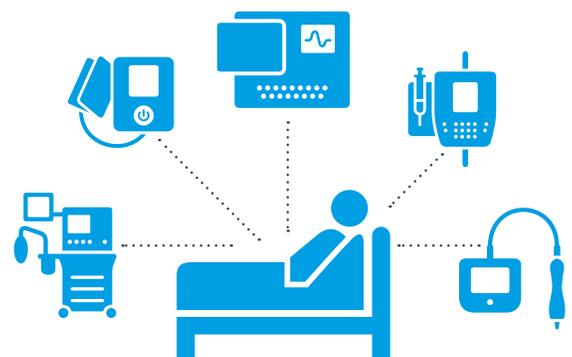
- “Clinical distancing” is a new term relative to social distancing with the intent of helping to keep providers and other healthcare workers protected from this highly contagious disease.
- Smart utilization of resources will help define success for hospitals.
- It is imperative to use technology to put distance between people and providers whenever possible without sacrificing quality of care

Remote Monitoring & Device Integration

The first step to achieving both clinical distancing and a higher level of patient-centered care is remote monitoring and device integration. They are the cornerstones for managing patients in this pandemic, and creating a new standard of care founded on software-based monitoring, patient-centered AI and machine learning at scale in the future.

Consider this: In a critical care environment, one patient can generate more than 800,000 samples of data every hour, just from bedside monitoring devices. Combined with information from the EMR, labs, medications, imaging, data lakes and more, we have an incredible volume of data that can be utilized to understand the patient's condition. The challenge is gaining remote access to the real-time waveform data from a patient's bedside devices, along with the beat-to-beat historical data for a patient's entire length of stay.

Traditionally, many bedside devices are locked down in their respective silos, each a stumbling block for integrating the information into a complete patient picture. Also, most of these devices, including ventilators, don't store data, nor do they make it accessible for remote access or analytics. This situation is compounded further during COVID-19, a pandemic that has hospitals scrambling for access to the cardiac monitors, ventilators and other devices needed to monitor patients. Some desperate clinicians are bolting together devices from many disparate vendors in a beleaguered attempt to get the data they so desperately need.



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In a critical care environment, one patient can generate more than **800,000** samples of data every hour, just from bedside monitoring devices.

Today, through MIC's FDA-cleared Sickbay™ platform, not only is that formerly disparate data available, it's also synthesized and accessed in real-time and retrospectively on any web-enabled device. This allows for unprecedented, scalable visibility for clinicians into their patients' conditions. Whether clinicians are in a command center or virtual ICU, in their office or home – or perhaps in quarantine themselves – access to real-time

and retrospective patient data gives them the opportunity to virtually round, make recommendations to the hands-on team, and provide treatment from wherever they happen to be.

“Clinical distancing” can preserve and stretch resources at scale and allow our healers to heal as many patients as possible during this pandemic.

Keep in mind:

- Remote monitoring and device integration are the foundation of clinical distancing.
- Physicians and nurses need remote access to real-time waveform data and beat-to-beat historical data for an entire length of stay from all connected devices at the bedside.
- Data should be integrated into multiple remote workflows to enable flexible access across units, facilities and devices.
- Remote data should include an integrated view of all bedside data.
- Accessibility to the data is essential for care teams to virtually round and monitor their patients' conditions from anywhere in a way that is HIPAA-compliant, accessible and timely.

Software-Based Virtual ICUs and Remote Monitoring Enable Rapid Scaling

COVID-19 has presented the U.S. with the challenging reality that we will likely need tens of thousands, if not hundreds of thousands, more critical care beds than we have. Besides the continuous monitoring of patients, what gives critical care beds an advantage over regular hospital beds is the level of attention and capability offered to these patients by skilled physicians and nurses who specialize in treating the sickest of the sick. As healthcare struggles with treating the largest cohort of critical care patients it has ever had at once, virtual ICUs, or “vICUs”, virtual rounding, and remote monitoring solutions are at the forefront of conversations.

With patient census doubling nearly every day, the key to leveraging a vICU and virtual rounding technology is choosing a solution that can rapidly scale bed and provider capacity to care areas that weren’t designed with this intent in mind. Many vICU and remote monitoring solutions are hardware-based, vendor-specific, often locked down to a specific unit, and therefore aren’t able to scale as fast as is needed. As we race to bring up beds in unused units such as day surgery areas, EDs, and even off-site locations like converted hotels, tents, and other buildings, software-based solutions allow hospitals to rapidly turn any bed into a critical care bed without adding extra equipment in already-crowded rooms.

As we race to bring up beds in unused units such as day surgery areas, EDs, and even off-site locations like converted hotels, tents, and other buildings, software-based vICU solutions allow hospitals to rapidly turn any bed into a critical care bed without adding extra equipment in already-crowded rooms.

At current sites that have Sickbay, MIC is able to turn on additional beds in minutes. At new sites, any unit can be turned into a vICU within weeks and remote access to all collected data can be enabled on any PC, tablet or phone so that other providers can support care teams on the front lines. And then, once installed, these hospitals have the same benefit of adding in beds as needed with a one-click change in the database.

This is the second step in battling this pandemic: solving the bed shortage issue by rapidly transforming any bed into a monitored ICU bed. Next is the challenge around the lack of medical professionals experienced in healing critical care patients. These valuable resources are in even shorter supply as staff is stretched to its limits, and sometimes constrained by their own illness or that of a family member, or are in quarantine due to exposure.

A software-based solution allows their skills to be most efficiently used. Imagine this: One experienced critical care physician reviewing 100 patients on a single screen, monitoring beds across device vendors, floors, units

– even across facilities within the same system. Similarly, one experienced critical care nurse can manage up to 50 patients on a single screen and virtually round, while other nursing and clinical support staff at the bedside interact with patients to carry out the care. Or even imagine providers coming out of retirement, critical care or respiratory professionals, keeping their trained eyes on patients from their own home, office or quarantine. A software-based solution not only allows for efficiency in the utilization of on-site providers, but also allows hospitals to expand their care teams to those with critical experience and insight without bringing them onto the floor or even anywhere near the hospital.

Keep in mind:

- Software-based vICUs and remote monitoring solutions allow hospitals to turn any bed into a critical-care bed to enable virtual rounding of patients outside units or the hospital itself from any location.
- Hospitals need the ability to expand and contract the number and type of beds they monitor for critically ill patients; a software-based solution enables that.
- Sickbay is able to turn any unit into a vICU within weeks and, once enabled, add additional beds in minutes as capacity needs expand.
- Sickbay is able to unify patients across units, vendors, and facilities into a single view, allowing remote care providers the ability to monitor patients specific to their specialty.
- The utilization and protection of resources such as experienced critical care physicians and nurses is an important aspect of a vICU and remote care. Sickbay offers flexible virtual rounding options so hospitals can expand care teams to include retired professionals or quarantined staff, without bringing them on-site.

Augmenting Decision-making with Complete Retrospective Data & Patient-specific Analytics

Hospitals and health care systems are carefully analyzing how to augment clinical decision-making and expedite intervention in a world with a shortage of trained critical care professionals. The fact that many COVID patients aren't responding to normal courses of treatment – especially ventilated patients – is reframing the approach to decision-making in healthcare worldwide.

The availability of full retrospective data from Sickbay is also the the foundation for the development of hospital created risk scores based on actual real-time, patient-specific data.

Sickbay's remote views include the only fully retrospective web-based application of beat-to-beat historical patient data for an entire length of stay – across all connected devices such as monitors and vents, along with alarms and alarm limits. Other patient data such as labs, medications and observations from the EMR can also be added to the retrospective view. This view is essential in helping clinicians determine root cause analysis and expedite intervention because they can remotely see days, weeks – even months – of patient data

and automate the building of trends specific to that person. With one click, clinicians can even share those trends with on-site or remote caregivers or specialists to further enhance clinical decision support and augment staff at the bedside.

But how do we get ahead of risk? The availability of full retrospective data from Sickbay is also the foundation for the hospital's creation of risk scores based on actual, real-time, patient-specific data. Because, physicians and nurses are learning more about the effects of COVID-19 on patients every minute MIC is currently working with users on other ways that we may be able to help augment decision making. For example, one of the greatest challenges they are reporting is that patients aren't presenting the same and aren't responding to traditional treatments, especially those patients with acute respiratory distress syndrome who require some form of respiratory or ventilation support. As we continue to work with these hospitals and healthcare systems who now have access to all the data they need to inform those decisions, and as new risk calculators and analytics are created by them, MIC will work to integrate those into the Sickbay platform as well.

Within a vICU or other web-based remote monitoring workflow, Sickbay is able to display user generated risk calculators. These scores can be based on real-time data for patients categorized however the care teams believe creates the most value for them.

Other patient-specific analytics that can expedite decision-making and intervention can also be created from the retrospective data, especially for patients at risk for needing supplemental oxygen or ventilation. And then, this data can be leveraged to create patient trajectory views that can support getting patients on and off vents faster.

Keep in mind:

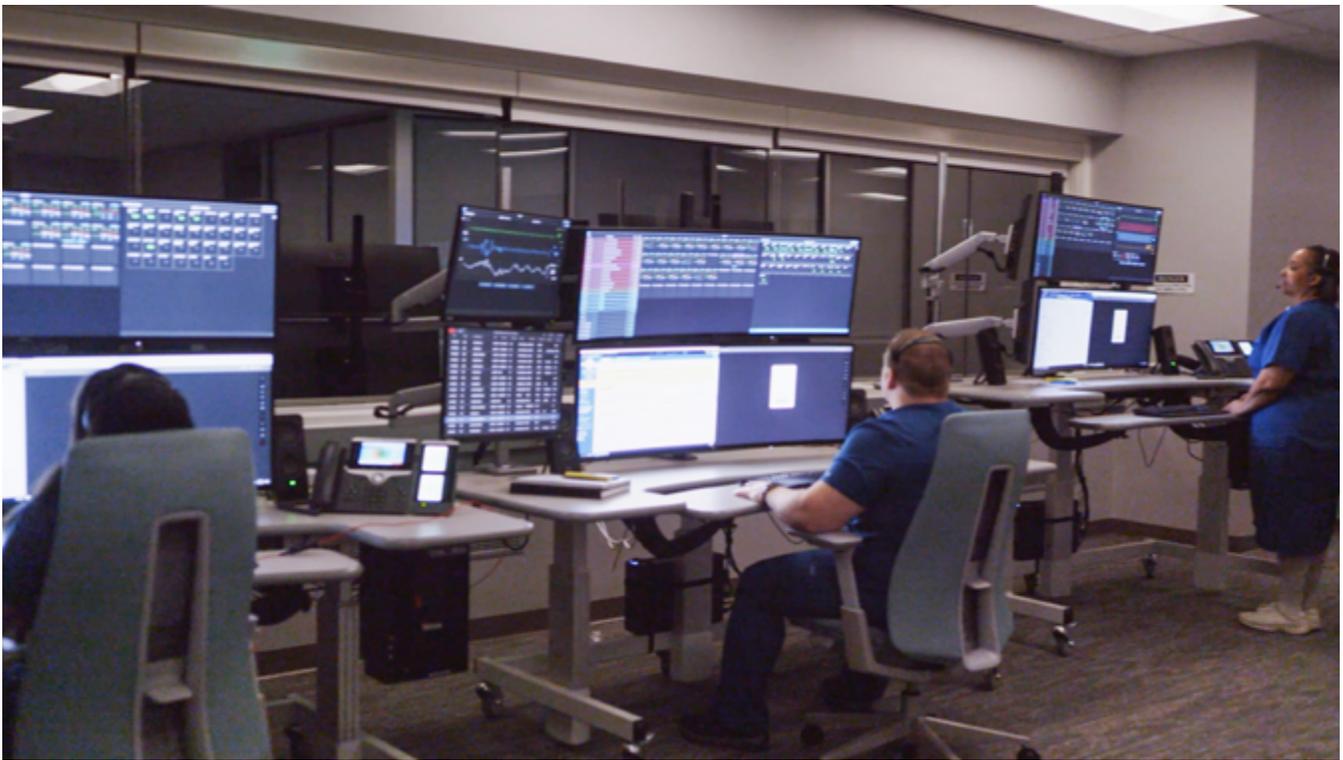
- Analytics offered by real-time monitoring expedites virtual rounding, allows for hospital created risk calculators, scoring and enhances clinical decision support to augment decision making.
- Sickbay presents the only fully retrospective, web-based application of beat-to-beat historical patient data for an entire length of stay--across all connected devices such as monitors and vents--and the ability to add in other patient data such as labs, medications and observations from the EMR.
- The availability of full retrospective data from Sickbay is the foundation for users to create risk calculators based on actual real-time, patient-specific data.
- Patient-specific analytics can help augment decision-making and help with optimizing usage of resources like ventilators.

MIC in Action: Protecting Providers, Scaling Beds on the Fly & Saving Lives

Hospitals and healthcare systems across the country are looking for answers to help protect their providers and provide excellent care to save lives, especially in the midst of this unprecedented pandemic. Here, we share a story from Houston Methodist who as already leveraged the capabilities outlined above to help protect their providers, enable virtual rounding, and expedite intervention of COVID patients:

Houston Methodist Hospital

At the flagship hospital for the Houston Methodist system, Sickbay was used to create a virtual ICU. The MIC team is working with the hospital to expand its vICU risk and add patient-centered reporting and analytics with a particular focus on getting patients on vent management.



[Watch video of the Houston Methodist vICU in action.](#)

Read more about how Houston Methodist leveraged the vICU to support COVID-19 Becker's Health IT interview. In the article Chief Innovation Officer and VP of Innovation describe how they have been leveraging the vICU to help with the pandemic:

Since Sickbay was “already in place in a more limited fashion” at Houston Methodist, we were able to quickly expand the solution to “turn on beds for COVID-19 patients so our providers could see patients via virtual visits and not risk exposure in ICU rooms”. The technology is “now being utilized by the masses to support the COVID-19 patient surge” and ready to scale as needed.

From vICU's to Flexible Virtual Rounding

Houston Methodist and many of MIC's other clients are also rapidly expanding provider access and implementing policies that instruct providers to do virtual rounding.

Because Sickbay is web-based we've seen these institutions bring in large screens into auditoriums and conference rooms, add screens onto workstations in wheels outside of units, or simply set up PC's in offices and homes to conduct virtual rounding and collaborate anytime, anywhere.



Next Steps: Put Technology to Work for You

Implementing solutions today that can reduce provider exposure, expedite intervention, and allow hospitals to rapidly expand bed capacity will make the difference as we battle the virus known as COVID-19. It will also create a new standard of care for everyday flexible and scalable monitoring and patient-centered analytics down the road—and for other public health needs that may develop in the future.

Demand the data. It's the only way to get through this crisis today, and to function at top efficiency in a new world of healthcare tomorrow.

[Schedule an appointment](#) with one of our dedicated team leads to discuss your facility's needs today.

This guide is brought to you by:



Medical Informatics Corp. (MIC), developers of Sickbay

Medical Informatics Corp. (MIC) is setting a new standard of care founded on software-based patient monitoring, real-time predictive analytics, and patient-centered healthcare. The company's FDA-cleared Sickbay™ clinical surveillance and analytics platform unlocks and processes complete patient data – specifically the 800,000 samples per hour of waveform monitoring data coming off of critical care beds – and delivers it in real-time to clinicians at the bedside. MIC helps hospitals and healthcare systems manage care, automate documentation, recover lost revenue, and ultimately improve care by using data to drive results. MIC's Sickbay platform enables the ability to transform any hospital bed into an ICU bed, create virtual ICUs and command centers that can be stood up anywhere, at any time, and develop and deploy patient-centered analytics at scale. Founded by engineers and researchers whose work with clinicians at the bedside led to groundbreaking discoveries, MIC is based in Houston, Texas, and works alongside hospitals and healthcare systems across the country to create a new standard of care driven by unprecedented access to patient data. More information is available at www.michealthcare.com and sickbay.michealthcare.com.



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