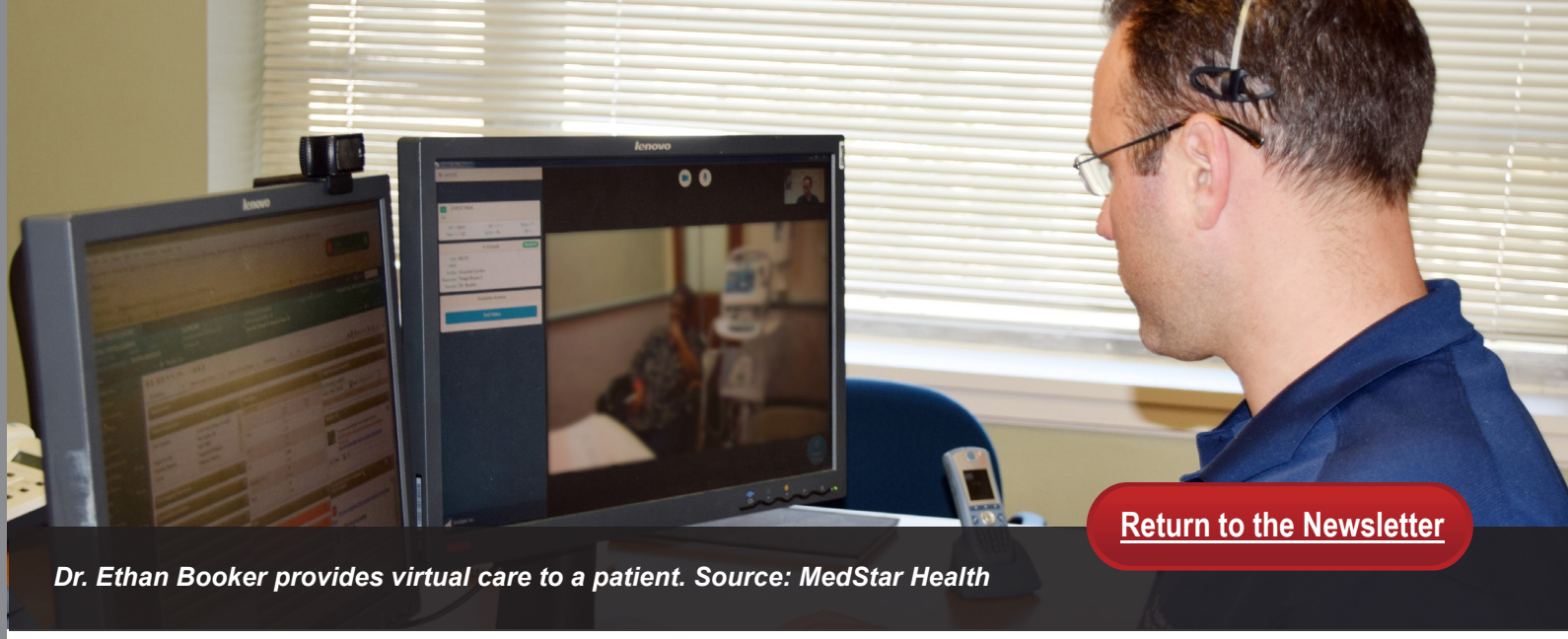

Dr. Ethan Booker provides virtual care to a patient. Source: MedStar Health

Return to the Newsletter

The Evolution of Telehealth at MedStar Health

MedStar Health is a not-for-profit health system comprised of 10 hospitals (including nine emergency departments) and 300 care sites (e.g., urgent care locations, primary care providers, heart and vascular care providers, and stroke rehabilitation services). As one of the largest hospitals in the U.S., MedStar Washington Hospital Center (located in the heart of the District of Columbia) has been using telehealth services since implementing a telestroke model in 2010. ASPR TRACIE met with Ethan Booker, MD, FACEP, chief medical officer for Telehealth at MedStar Health, vice president of the Care Innovation Lab within the MedStar Institute for Innovation, and an emergency physician, to learn how their telehealth services have evolved over the years to meet the diverse needs of the community the system serves.

John Hick, ASPR TRACIE Senior Editor (JH)

How did MedStar Health's telehealth program begin?

Ethan Booker, MD, FACEP (EB)

In 2010, we started a telestroke model, which allowed all MedStar Health emergency departments to quickly connect with stroke specialists at our two comprehensive stroke centers, MedStar Georgetown University Hospital and MedStar Washington Hospital Center. In line with national experience, we improved standard stroke metrics, including timely brain imaging, appropriate patient selection, and timeliness of thrombolytic therapy.

In 2015, to improve emergency department (ED) efficiency, we implemented the MedStar Health Emergency Department TeleTriage Program (referred to as teletriage) at MedStar Washington Hospital Center. Until this time, our EDs followed an in-person provider-in-triage (PIT) model, where patients would be seen by a physician upon entering the ED from the waiting room. Physicians could see up to 90 patients per shift under this model, and while ED metrics did improve, it was challenging to scale to this approach to a 24-hour model and to other lower-volume departments. It was also a very demanding shift. In 2015, we piloted the TeleTriage

Related MedStar Health Resources

Biocontainment Unit

Care Innovation Lab and Telehealth

MedStar Health

MedStar eVisit – Telehealth

MedStar Institute for Innovation

National Center for Health Security and Resilience

Other Related Resources

ASPR TRACIE's Virtual Medical Care Topic Collection

Connected Primary Care: Using Nurse Practitioners via Telehealth to Boost Patient Access and Physician Well-Being

Preliminary Assessment of a Telehealth Approach to Evaluating, Treating, and Discharging Low-Acuity Patients with Suspected COVID-19

Program, where that PIT physician was instead stationed at a remote command center, able to connect via live, two-way video while simultaneously reviewing the patient's electronic health record (EHR).

We have been using teletriage for over a decade, and our technology has evolved over time. During any given 24-hour period, we could have up to 550 patient contacts that are throughput-related, plus consultations from one of our 34 MedStar Health Urgent Care locations. These virtual consultations have helped us streamline the urgent care patient transfer decision-making process and have optimized our ED transfer rate.

JH

Are patients receptive to virtual care?

EB

Absolutely—patients want care, period. I think the distinction of "virtual" is more present in our minds than in the patient's. People can see value. Early on, staff were concerned patients would not be receptive to being seen via video. But we surveyed patients from the beginning and after a few months we had plenty of data that patients were satisfied because care was delivered more quickly. I have always worked in urban EDs, and while they can take care of extremely sick patients, they are often quite full. Patients who live in these areas arrive expecting to wait for care, so when they were seen quickly via teletriage, their care started earlier, and they received medication faster, the value was obvious to them and well received. When you've got profound nausea, you care when the IV goes in and fluids and meds start, not where the doctor's feet were when the order happened.

A family of seven came to the ED with symptoms and were COVID-19 positive. We put them in the same room, they were all seen via teletriage by just one provider, received treatment and follow-up instructions, and were quickly released, saving time and space, and minimizing exposure.

JH

How did the pandemic change your approach to telemedicine?

EB

By 2019, several of our EDs were regularly using teletriage. In 2020, we pivoted the workflow to allow us to evaluate patients suspected of having COVID-19 and who met specific criteria, basically excluding extremes of age, chronic illness, and abnormal vital signs. We would swab them in the triage booth, complete their evaluation via telehealth protocols, and send them home with self-care instructions. We leveraged an existing abnormal lab follow-up team to notify patients of results. We used this process with hundreds of patients, saving us approximately three kits of personal protective equipment per patient in the early stage of the pandemic. At that point, we did not have a full understanding of the virus transmission and gowned up entirely for every patient. Their average visit time in the ED was approximately 40 minutes compared to the two plus hours they would have experienced through an in-person process. Several additional risk metrics improved. For example, patients came in contact with far fewer associates, and time spent near other people in the waiting room—either exposing them or being exposed—also decreased. We followed these patients to ensure their outcomes were the same as those who experienced in-person visits and found no difference in safety measures or 30-day returns to a hospital. For a different group of patients, those diagnosed in the ED with COVID-19 and without clear criteria for admission, we developed a remote patient monitoring (RPM) program. We supplied patients with a pulse oximeter and enrolled them in a program that checked in daily to assess symptoms and look for tachycardia or hypoxemia. This allowed us to safely discharge hundreds of patients, preserving bed capacity but also ensuring that patients who looked well today but decompensated later could be detected.

JH

How else did your telehealth services change overall during the pandemic? Did MedStar Health offer fully virtual visits during that time?

EB

In 2017, we built the MedStar Telehealth Innovation Center which sits inside the MedStar Institute for Innovation. Over the years, we have consolidated our telestroke, teletriage, behavioral health, and virtual urgent care programs. By 2020, MedStar Health had five years of experience with an app and web-based virtual urgent care platform, and low volume experience in scheduled visits. We had also built some initial people and process capabilities for RPM. We had the necessary infrastructure so that when the Centers for Medicare & Medicaid Services issued their telehealth waivers in March 2020, we hit the ground running, seeing nearly 500 virtual urgent care patients and thousands of scheduled visits in a day during the initial pandemic wave.

Between March 2020 and the following summer, we waived payment for our virtual urgent care, encouraging residents to get care at home instead of an ED, urgent care, or clinic. This wasn't limited to COVID-19; we took care of everyone who used the platform. This allowed us to develop an enormous amount of expertise across Maryland, Virginia, and Washington, D.C. We retained much of that workforce, and the business has matured over time. We continue an upward growth curve, anticipating we will support approximately 50,000 patients this year, making us the busiest virtual urgent care in our region.

JH

How have you changed your staffing models to keep up?

EB

Yes, we've leaned into a model of connected care, not just bolting telehealth on, but reorganizing people and processes to create access, flexibility, and quality in a truly distributed delivery network. That staffing model looks different in various use cases, and I'm hoping we'll talk about other areas like primary care and transitional care as well, but in the initial use case we've talked about—teletriage and urgent care consults have a blended model. Our emergency providers are staffed like a 10th emergency department, with a physician and APP leader and admin staff, separate scheduling, performance metrics, and credentialing pathways. Most of those physicians and PAs still work most of their shifts in-person in our EDs, but for the telehealth shifts they are focused on virtual queues only. Our specialists are busy in their clinic or hospital rounding day and get a text message that an urgent care consult is waiting for them.

We did not change our staffing model in our urgent care, but our providers, many of them solo covering a location, are much more comfortable knowing they have back up, and we've seen good safety catches and decreased ED transfer rates. A brief video check-in with a specialist also increased the likelihood of patient follow-up to address their conditions. Patients feel they already have a connection and take seriously the need to continue their care with us.

JH

Are these specialists dedicated to telehealth during certain shifts or is this an ad-hoc service?

EB

It's an ad-hoc service. That cardiologist might get two or three short calls a day, with urgent care staff asking them to quickly review an EKG, for example. We use attendings, experienced cardiologists, who generally spend the rest of their shifts doing consults in the hospital and who can answer these types of calls very quickly.

Emergency physicians are typically working in front of multiple screens, mostly from home. Telestroke physicians split their time providing virtual and in-person care.

JH

We often picture telemedicine as being on two ends of the spectrum (primary care visit or specialist consultation) when we can also involve a primary care provider in the consultation. Does MedStar Health do this?

EB

Yes, this is part of our model. Let's say a primary care physician has a question about a complex endocrine workup. Like a lot of academic health systems, we use asynchronous eConsults that allow that physician to send a structured question to a pool of medical specialists—in this case, an endocrinologist. The specialists review the question, relevant records, and reply within the EHR. Our typical response time is one business day, creating the appropriate care plan for the patient and shrinking the wait time across the system.

JH

Being able to scale a virtual model is important. Other than the pandemic, have you tailored the model to other incidents or specialties?

EB

Our pandemic response was a significant period of telehealth effort. In many ways, though, change management to build new processes, business models, staffing, and culture to leverage what we learned has been harder. We continue to build upon our infrastructure, with a focus on capability building as opposed to use-case models. We want to ensure we can turn up the dial instead of breaking glass should an incident occur or new need arise. We've built capability in primary and specialty care, hospital rounding and consults, ambulatory and facility behavioral health, and many other areas, again with a focus on foundational capabilities that can be adopted to the purpose.

For example, we built a Connected Transitional Care model, with remote nurse practitioners aligned with care transition nurses and call center navigators to address hospital readmissions. This program has shown considerable impact on 30-day readmissions across many conditions. Extending that experience, we are adding a capability to focus on patients with congestive heart failure since they have a high readmission rate. This program includes RPM with a blood pressure cuff, scale, and digital engagement, but also nutritional interventions borrowed from our highly successful Diabetes Boot Camp program.

We have also increased our capacity to use telehealth during extreme weather events. In Washington, D.C., for example, a snow day can upend ambulatory care office schedules.

Our experience with virtual urgent care drove us toward creating more purpose-built virtual clinic capabilities. Under our Connected Care model, we focus on increasing availability and flexibility. Our Connected Primary Care program includes 15 nurse practitioners (NP) supporting our approximately 350 primary care providers. These remote NPs provide same day and next day telehealth visits that boost access, staff our RPM programs, answer portal messages, and manage a very large volume of medication refill and renewal requests. We recently published data in New England Journal Medicine Catalyst that showed that not only did access improve, but productivity, engagement, and patient experience all improved as well. The remote NPs love their work, and the primary care providers take on higher acuity cases and new patients, and have substantially decreased "pajama time," which refers to answering portal messages and medication requests after hours.

JH

What role does your telehealth function play in regional disaster response? How can it be used to meet needs in new ways?

EB

Our program covers the entire spectrum, from educational campaigns to critical care support, using tools like chatbots and artificial intelligence (AI). In the early days of the COVID-19 pandemic, we launched a chatbot that was purely one directional and informational for patients. It highlighted symptoms to be aware of, when to stay home, and how and when to seek care. With a unidirectional tool like this, we can serve millions.

A bidirectional version of this would have included the ability for users to chat with us; we can do this for tens of thousands. Adding AI to this feature would have allowed us to serve larger numbers of patients with bidirectionality. We really try to emphasize to our patients and community members that telehealth can help them decide what their next step in their care should be, whether that is staying home and keeping an eye on things, going to an urgent care center, or making use of other community healthcare resources.

During the pandemic, we learned that there were a lot of people whose chronic illness needs weren't met because the healthcare system was under so much pressure. It is important to remember that even though they may not be directly involved with whatever disaster is happening, we must ensure they maintain continuity of care.

"From reaching millions of people with a chatbot to caring for one really sick person in an intensive care unit, there are applications across the entire virtual healthcare spectrum we can use to create a comprehensive program."

In a disaster or public health emergency, in addition to using "front door capabilities" for rapid triage, critical care consultation is key. Hospitals in all settings—rural, urban, critical access—found themselves learning to care for intubated, ventilated, high-risk patients during the pandemic when patient transfer services were limited. Remote consultations helped tremendously in areas not used to delivering that kind of care.

We are now working on using our telehealth tools to build that care capacity in intensivists and nurses to prepare them for similar scenarios where patient transfer is challenging. As we think about capacity, there are three major components. First are the technical capabilities—the hardware, software, cabling, and connections that are the table stakes for digital care delivery. Second are the people: the clinical skill sets required, along with availability, licensure, credentialing, and insurance they need, as well as the support staff needed to ensure it all functions. The final element is process—how things connect, who calls whom, when and for what issues, and what happens when something breaks. Those process issues often end up being the hardest and most persistent part of building and maintaining the capacity to respond. Getting the right skill to the right place at the right time—and resourced and supported in a way that allows them to deploy that skill—that's what we mean by a built capacity.

JH

How do you work with at-risk populations who may be fearful of the technology or may not have the means or tools to access telehealth?

EB

Accessibility design was important to us from the beginning. While some patients struggle with telehealth technology, we do our best to make using it as easy as possible. Patients with a scheduled telehealth visit simply click a link on a text message. When it is time for the appointment, users receive another link to click on. Because our program is web-based, it works with most devices and browsers even if they have not been updated recently.

In a disaster, we would send initial messages in languages primarily spoken by our community members. We have interpretation embedded in our program, and in our visits, and we can also communicate using closed captioning and American Sign Language. We have users of all ages, and while telehealth takes some getting used to, trust is what matters here. If you ask a patient if they would be willing to get a prescription from a telehealth physician, they may say no, but when you ask if they would be willing to meet with their primary care physician over video and get a prescription, they will not hesitate.

As I mentioned earlier, during the pandemic, we built RPM capability to conserve space in our hospitals. For more than 3,000 patients who met certain criteria—positive for COVID-19, no oxygen requirements, not tachycardic—we provided a pulse oximeter, enrolled them in the RPM program, and sent them home. The vast majority were able to download the app on their phones while they were in the ED and we provided education in real-time. The small group of patients who did not have phones or access to technology were added to a call list. Due to both types of patient monitoring, we were able to identify a few patients who became very sick, very quickly.

JH

What were some of the challenges a system might encounter specific to using telehealth during a disaster (or in general) in a region?

EB

The barriers to regional multistate cooperations are real and layered. While there were many waivers during the pandemic, regulatory issues remain. There are complex challenges associated with state regulations, licensing and malpractice coverage, and technology interoperability. While many systems use the same, or similar, EHRs, connectivity challenges are compounded when hospitals in a region use different software.

JH

How is your system using AI in virtual medicine? For example, if a patient tests positive for Influenza A on a home test during an H3N2 surge, but we are short on anti-virals, how might an AI assistant help perform triage, and to what extent?

EB

The interaction between technology, culture, reimbursement models, and regulation can be a complex space. The technology is relatively straightforward; it is primarily an algorithm and a supply chain question. If using AI, it would be critical to determine who is providing the virtual counsel or how the sources of information were vetted, whether the pharmacy would fill the prescription if not submitted by a human, what the liability of the healthcare provider and pharmacy looks like, and other variables.

There are some examples of this that are not related to infectious disease. For a patient with a chronic illness, AI has been used to help with medicine titration with the goal of accelerating therapeutic interventions—thereby minimizing the time it takes a patient to make an appointment, travel to the appointment, complete lab work, wait for results, and fill the prescriptions. The physician would determine triggers for lab work and titration, and the system would handle the automations while the physician monitors the patient remotely, gathering physiological measures and patient-reported measures. These models still require a human to handle accountability, data entry, prescribing, and other factors.

JH

What are your backup or downtime plans in the event of a power outage or cyber incident?

EB

Most of us view cybersecurity and infrastructure resilience as two sides of the same coin. Being serious about technology in the healthcare space is critical; we certainly have room to grow in the overall maturation of our field when it comes to cybersecurity. It's not just about these digital models, it's about how your ED functions during an EHR downtime, both in person and virtually. Everything we build in a digital way has a downtime process and redundancies. For example, our EHR software that hosts our video client is built across two server stacks; if one goes down, we can smoothly pivot to the other server.

JH

What's next for your program?

EB

Specific to the health security domain, we continue to innovate within our ASPR designation as a Regional Emerging Special Pathogen Treatment Center (RESPTC). Our Biocontainment Unit (BCU) functions every day as an observation unit but can quickly pivot to serve two highly infectious patients and an additional 15 with respiratory isolation. The BCU is completely wired, allowing us to protect both our patients and providers. The unit includes pan, tilt, and zoom cameras on the walls so physicians can monitor patients remotely without having to gown up and go in that room. We can observe all the egress and ingress areas of the transition zones, including our laboratory area. We partner with Children's National Hospital and Johns Hopkins to cover both pediatric and adult patients.

Principal Deputy Assistant Secretary Knox tours MedStar Washington Hospital Center's Biocontainment Unit. Photo courtesy MedStar Health.

We have also built RPM programs for staff who may have been exposed to a highly infectious pathogen.

Additionally, we are working with the State of Virginia to build and test a high acuity, low occurrence—or HALO—quarantine monitoring program for patients who were exposed to a specific pathogen but are not sick.

Finally, together with our academic partners from Georgetown University, we are developing a National Center for Health Security and Resilience. This combines the expertise of the BCU, RESPTC, partnerships with ASPR and the National Emerging Special Pathogens Training and Education Center, and the university's schools of foreign policy and foreign service to create a center in the nation's capital focused on health security and resilience.

Automation and AI are powerful tools that help us achieve our longstanding mission as a not-for-profit, academic, and community health system. Using them effectively and responsibly represents our commitment to evolving to best meet our community's needs. We also remain committed to delivering care in-person and in other ways that serve a patient's specific needs. Ultimately, we work to maintain the trust we have built that is rooted in both a physical, and virtual, presence.