



## *Removing Bandwidth Barriers The Impact of 5G on Healthcare*

**H**ealthcare has embraced Big Data and the advanced applications, technologies, and strategies it enables – AI to support clinical decision-making, machine learning that helps radiologists spot otherwise invisible tumors, natural language processing that can mine data buried deep in electronic health records. But after turning to the cloud to solve Big Data’s voracious appetite for storage, hospital and health system CIOs have encountered another challenge – trying to leverage legacy networks to carry data volumes that were unimaginable just three years ago.



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MICHAEL “CHRIS” GIBBONS | Chief Health Innovation Advisor, FCC Connect2Health Task Force | CEO | The Greystone Group

Compounding the problem, existing networks are struggling to support the unplanned shift to a newly distributed workforce and remote healthcare delivery in the midst of the COVID-19 pandemic. Suddenly, IT departments are onboarding, supporting, and protecting vast numbers of home-based, healthcare workers who still need access to petabytes of business and patient data, including clinicians who are utilizing bandwidth-hungry telehealth devices to treat patients remotely.

Fortunately, a better network option is at hand. 5G networks—which supersede not only existing 4G and LTE cellular networks, but also Ethernet and fiber as well—permit data throughput at speeds up to 100 times faster than prior generations of cellular offerings, reduce latency from more than 20 milliseconds down to as little as 1-2 milliseconds, and support a far greater number of device connections.

“5G’s benefits enable real-time data capture, cloud computing, AI, and automation, all at the point of need, anywhere,” said Michael “Chris” Gibbons, Chief Health Innovation Advisor for the Federal Communications Commission’s Connect2Health Task Force and the CEO of The Greystone Group. “Historically, in healthcare, we’ve had limited interactions with patients outside of the clinical environment. But 5G enables interactions with patients in real time, anytime, wherever they are, just as if they are in front us.”

5G not only accelerates data connectivity for today’s applications, Gibbons said, but it also lays the foundation for a near-term future in which chronic diseases are managed autonomously, thanks to AI and remote sensors. It’s a future where underserved communities can benefit from immediate

and unfettered access to experts anywhere in the world, and clinicians can deploy cutting-edge tools that will enable critical, life-saving diagnoses and treatments beyond a hospital’s physical walls.

The advent of 5G, Gibbons concluded, “will absolutely, astoundingly, help improve healthcare.”

He’s not alone in that assessment—a 2019 Accenture study found that four out of five healthcare executives agree that “5G will revolutionize their industry by offering new ways to provide products and services (e.g., drone delivery, driverless vehicles, faster video transmission).”<sup>1</sup> Healthcare systems that incorporate 5G technology into their IT platform to deliver better patient experiences and outcomes, enable automation, and drive data-based business strategies will clearly hold a competitive advantage.

## Coming soon to a city near you

Today, only about 16% of providers report using 5G networks. That’s because the rollout has only just begun—as of January, 5G is functioning in 378 cities across 34 countries and most of those cities are concentrated in a few countries, including China, the United States, and the United Kingdom.<sup>2</sup>

But CIOs and other health IT leaders are eagerly awaiting the opportunities it provides.

“The absence of 5G limits our ability to take advantage of subject matter experts and high-end physicians and providers, and get them to the right patient at the right time, such that they can deliver the right patient care,” said



*“COVID taught us several lessons. First, we had to stand up some physical networks to serve our remote testing sites, but in a 5G world, you could have stood those sites up faster without any kind of physical infrastructure. Second, we had many patients with mild symptoms who weren’t quite ready for inpatient visits, and we could have benefited from the ability to monitor them remotely.”*

**JOHN P. DONOHUE** | Vice President, Information Services and Enterprise Services | Penn Medicine

John P. Donohue, Vice President of Information Services and Enterprise Services at Penn Medicine. “We think 5G will open that up, as well as improve the ability to distribute high-end images across our health system in an effective, real-time manner.”

Telecom experts—such as Verizon CEO Hans Vestberg—predict that approximately half the U.S. population will have access to 5G by the end of 2020. But, the experience with COVID-19 could accelerate efforts to extend 5G networks into the country’s most rural areas.<sup>3</sup>

“COVID taught us several lessons,” Donohue said. “First, we had to stand up some physical networks to serve our remote testing sites, but in a 5G world, you could have stood those sites up faster without any kind of physical infrastructure. Second, we had many patients with mild symptoms who weren’t quite ready for inpatient visits, and we could have benefited from the ability to monitor them remotely—we would have been able to know instantaneously if their vitals changed and then could bring them in for care.”

“Broadband is the country’s most inequitable infrastructure,” noted Callie Patel, Director, Innovation Consulting at Healthbox. “And COVID has really demonstrated the disparities that result from it. 5G should help address that because it will improve not only access to telehealth services, but also the quality of those services—what technology can be used, and the services that can be connected.”

## Empowering automation

While cellular networks originally addressed the communications needs of people, 5G’s benefits—100X speed, low latency, and exponential increase in supported connections—will also power the communications requirements for machines. The most transformational developments in healthcare today include data-driven applications in artificial intelligence, machine learning, and natural language processing, all of which require constant, lightning-fast data exchange among a web of thousands of sensors, devices, and servers.

“Data throughput has long been a constraint on innovation,” observed Vishal Jain, Vice President and Site Executive, Information Systems & Technology, at the University of Maryland Medical System. “5G will spur more innovation in virtual reality, robotic surgeries, and other AI technologies, improving healthcare in remote settings. It’s not far off, and it is already supporting autonomous machines in other industries like self-driving cars.”

Automation figures to produce advances not only in clinical care, but on the business side of healthcare, as well. Forward-thinking healthcare systems are using digital transformation to create transcendent consumer experiences—unifying what has often been a fractured and disparate patient journey. By putting the patient back at the center of care, these systems are building consumer loyalty and trust, while at the same time reducing expenses and applying resources where they are most needed.



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“Ubiquitous bandwidth enables two things,” said Anshul Pande, Vice President and Chief Technology Officer at Stanford Children’s Health. “One is constant access—not only directly with clinicians using telehealth, but indirectly to remote monitoring and all these other autonomous mechanisms.

“The second thing is that seeing a patient doesn’t mean they have to *come* to us,” Pande continued. “They don’t have to take time off from work, sit in horrendous traffic to reach the office, or sit in a waiting room with everybody else. [5G] ensures that our patients get the care they need, in the location they are at. And they can come to us when it’s urgent, emergent, and they need hands-on care.”

While 5G may not be a panacea for every challenge healthcare faces, it promises to enable providers to deliver enhanced services when and where patients need them the most. It sounds almost simple, but the impact can be profound.

“In an environment of ubiquitous computing, *everything* is connected to everything else,” Gibbons said. “In this paradigm, care will no longer be something you have to go someplace, or see someone, to get. Care is something that you will always be getting. Ubiquitous computing is ubiquitous care.”

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