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CICERO GROUP / 5G'S COMING IMPACT ON HEALTH CARE

# 5G'S COMING IMPACT ON THE U.S. HEALTH CARE SYSTEM

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The buzzword of the day is “5G”—the next generation of mobile internet technology that will follow 4G—today’s most common mobile device network. The 3G to 4G shift nearly 10 years ago ushered in a massive evolution in smartphones and tablets—delivering digital infrastructure and mobile data speeds that enabled video streaming and on-demand services such as Netflix and Uber. 5G will be even more [transformational](#)<sup>i</sup> by improving speeds, lowering latency, enabling internet-based connectivity, and enhancing bandwidth at a much quicker and more revolutionary pace than 4G. The thoughts below outline the benefits of, and challenges associated with, 5G implementation and offer some general perspectives on the unprecedentedly exciting new horizon for health care stakeholders.

## BENEFITS

5G will improve providers’ health care performance and consumers’ experience and outcomes across four distinct domains: (1) enhanced “internet of things; (2) increased speed and less latency; (3) more innovative and less invasive treatments; and (4) rural and low income support (See Figure I).

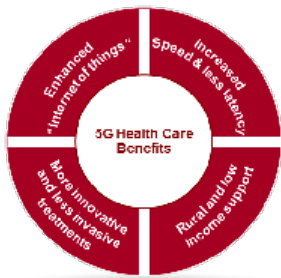
First, 5G will further the “internet of things,” an ecosystem that supports the internet-based and real-time communication of devices. In the health care context, 5G will enhance dialogue among medical devices, equipment, and wearables—ultimately improving physician decision making and remote patient monitoring, leading to highly personalized and preventive care.

Currently, physicians often receive 15–30-minute snap shots into a patient’s care journey. At best, physicians with accurate health care records generally lack data to have meaningful year-over-year discussions. At worst, physicians

rely on inaccurate or misinformed health information and histories. With smarter data streams and ultra-reliable networks, providers will more readily be able to follow events, identify changes, and more effectively share concerns sooner. They will have additional data points to make informed real-time decisions and harness rapid learning to better understand treatment effects.

The ability for patients and medical staff to exchange health information quickly and often, bypassing the need for physical presence and proximity, will facilitate hospital-like monitoring within a patient's home; similar to how they are now monitored within intensive-care units. For example, sensors could support a chronically ill senior with at-home care needs by providing patient vital signs on a rolling basis.

Figure 1



Second, 5G will heavily increase speed and cut excessive latency, or lags between a user's request and a website's response. The combo could eventually enable "smart hospitals." Chicago-based [Rush Health System](#)<sup>ii</sup> will be installing "small cells" throughout their largest hospital, Rush University Medical Center. Rush, partnering with AT&T, hopes to improve hospital operations and productivity by enabling intelligently scheduled rooms, decreasing the time needed to download MRIs or transfer imaging files, and more fully introducing artificial intelligence and machine learning into the patient care experience. To put latency into perspective, 5G could permit health care network users to download heavy data files and load websites as much as [100 times](#)<sup>iii</sup> faster than possible today.

Productivity saving 5G elements resulting from increased speeds and reduced lag times will generate significant cost savings and top-line growth opportunities. Hospitals [could save millions](#)<sup>iv</sup> after initial investments when they no longer need to pay for heavy wired infrastructure. The quicker flow of files will also reduce patient wait times and empower providers to see more patients in a day. Rather than having to send large PET scanner files during after-hours when peak network performance is highest, patients' results could potentially be sent as soon as they leave the scanner.

Third, 5G will expedite the rollout of more innovative and less invasive treatments involving complex medical [scenarios](#)<sup>v</sup>. [Robot-assisted telesurgery](#)<sup>vi</sup> will someday eliminate unacceptable delays between a physician's motion and a network's reaction. In fact, China has already pioneered [5G robot-assisted](#)<sup>vii</sup> telesurgery on a laboratory animal this year. While incorporating robotics into the standard practice of telesurgery is still likely [a decade out](#)<sup>viii</sup>, recent technological developments are highlighting the potential for enhanced patient outcomes down the road.

Fourth, 5G networks will facilitate internet-enabled health care services such as ongoing wellness and virtual visits for [rural and low-income areas](#)<sup>ix</sup> traditionally plagued with access constraints. While the impact will not be immediate, service providers such as [AT&T](#)<sup>x</sup>, Verizon, and Sprint are already announcing plans for "small cell" equipment roll out in larger cities. Eventually small cell equipment will penetrate more rural communities. Imagine an elderly patient with time sensitive needs and without access to a locally based specialist. 5G will allow that patient to more quickly access a specialist to

identify trends and diagnostic information. While some of these services are now available, they will be more ubiquitous, reliably capable of supporting real-time video, and eventually affordable

## CHALLENGES

5G will not transform the US health care market in a day, month, or even a few years. As mentioned, rollout could take a decade in some cases and will involve its fair share of challenges and hiccups. For example, 5G will necessitate significant infrastructure investments. Rather than 100-foot cell towers, 5G will require cities to install tiny radio equipment on structures up to every few blocks. And even if cities have 5G infrastructure, residents will need access to 5G-compatible devices, including smart phones. Rural areas will trail urban hubs both in access to infrastructure and adoption of compatible devices. Mass availability of infrastructure and adoption of compatible devices will not occur for years.

Beyond near-term access constraints, [privacy concerns](#)<sup>xi</sup> pose heightened risks to the 5G rollout. 5G will facilitate more precise location tracking given signals do not generally penetrate through walls and buildings well, and they will cover much smaller areas than today's cell towers do. 5G signals hackers will also have greater access to attack an organization's network because so many devices will be connected across care settings from the hospital to the physician's office all the way to the home. Ways to address these challenges include password-protected devices, data encryption, and separating non-critical devices from hubs that hold patient data.

## CONCLUDING PERSPECTIVES

In the past, people needing medical attention typically had one option: physically travel to the nearest care center. 5G will facilitate home-based services in ways previously considered unimaginable. There is much to hope for despite the likely need to wait several years and beyond to witness truly meaningful 5G market adoption and shifts. By acknowledging and addressing potential 5G risks early and often, health care stakeholders hold the potential to significantly improve patient care and enable longer and more productive lives. While China may have the early 5G first-mover advantage, the US market could ultimately lead out on wide-spread adoption given its world-class hospitals, skilled providers, and innovative DNA.



## ABOUT THE AUTHOR

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Douglas Hervey is a principal at Cicero Group with an emphasis in health care and life science services. Douglas most recently worked as a senior director for Leavitt Partners. As a senior director, Douglas enabled health care entities to more effectively aggregate data, automate research processes, and make sound growth-oriented strategic and investment decisions. He has worked on over 200 health care private equity investment deals, within 80 unique health care sub-segments, for over 40 investment funds.

Douglas earned his bachelor's degree in international relations at Brigham Young University, after which he earned his juris doctorate from the University of Pittsburgh. Douglas also holds an MBA from Brigham Young University, where he was a Hawes Scholar.

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