

A doctor in a white lab coat and glasses is sitting at a desk, looking at a tablet. The tablet displays medical scans and a video call with a woman. The background shows a desk with a printer, a lamp, and a potted plant.

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# 4 Reasons Why 5G and Healthcare Make Sense



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# 5G IS BECOMING THE STANDARD IN CELLULAR TECHNOLOGY



When 5G becomes the standard, healthcare organizations can no longer rely on cellular towers to cover their large facilities. It may be tempting to stick with the current technology infrastructure or make small incremental improvements, but the pace of change will soon overwhelm the Wi-Fi only deployments at most hospitals.

Healthcare management teams must consider building their own 5G infrastructure to support the demands of their customers, patients, medical staff and management teams. There is no better time than NOW to make that investment.

Building a 5G network will offer healthcare organizations decades of network stability giving them the flexibility to manage a constantly changing technology landscape.



# 5G OFFERS A FOUNDATION FOR NEW TECHNOLOGY



5G promises to revolutionize the way people connect. With improved capacity, greater speed and increased bandwidth, 5G offers a foundation for new technology which allows healthcare organizations to provide enhanced medical care to the communities they serve.

There are compelling reasons for healthcare organizations to invest in 5G networks now. If you have considered upgrading your IT infrastructure or are curious about how adopting 5G solutions will impact the way you care for your patients and support your medical team, then this e-book is right for you.

After you have had a chance to read this e-book, share it with your colleagues, take action towards one of the **Get Started** steps or reach out to us at [www.corning.com](http://www.corning.com). We would be interested in learning more about your medical organization and technology needs.



# HEALTHCARE

## WILL BENEFIT FROM 5G NETWORKS

# 5G

## WHAT IS 5G?

Fifth-generation wireless (5G) is the next iteration of cellular technology. It is faster, more responsive, and able to handle more connected devices than existing 4G LTE networks which are widely deployed today. 5G will enable new technology innovations that will benefit individuals and organizations across all industries.

All generations of wireless technology operate using electromagnetic waves to send and receive information. Electromagnetic waves are called radio frequencies and are measured in Hertz (Hz).

Source: <https://www.qualcomm.com/media/documents/files/spectrum-for-4g-and-5g.pdf>

The frequency spectrum includes Kilohertz (KHz) at the lower end with Gigahertz (GHz) at the higher end. AM radio stations broadcast in the KHz range. Current 4G LTE networks use frequencies in the 600 MHz to 2.5 GHz range. Wi-Fi signals operate at 2.4 GHz and 5 GHz. 5G operates in low (sub 1 GHz), mid (1-6 GHz) and high (24 GHz+) bands. Lower frequency waves travel far distances. AM radio stations can broadcast their signal for miles with a single tower. Whereas, 4G and 5G, with high frequencies require more towers and antennae to provide coverage.



# THE BENEFITS OF 5G

Click on each icon for more information



# TELECOMMUNICATIONS

## PROVIDERS AND 5G



Telecommunications providers like Verizon, AT&T, and T-Mobile are busy rolling out 5G technology. The expansion of 5G will offer consumers better cellular service in public spaces, on highways, and in our homes. Without dedicated in-building wireless infrastructure, 5G coverage in buildings like hospitals, medical campuses, hotels, and universities and many others will not be offered.

In the past, telecommunications companies' outdoor macro towers provided coverage indoors for large buildings. This was adequate as prior iterations of cellular technology, 3G and 4G, were able to penetrate the outer walls of buildings providing "good enough" coverage. But that isn't the case for 5G. In-building wireless infrastructure is needed to support a 5G network and this infrastructure is a decision made by each enterprise. Enterprise leadership will need to develop infrastructure plans and work with the wireless carriers to offer 5G coverage to their consumer and employee base.





HEALTHCARE SYSTEMS  
WILL **BENEFIT** FROM THE  
INCREASED SPEED AND  
CAPACITY OF 5G



# 4 REASONS TO IMPLEMENT 5G RIGHT NOW



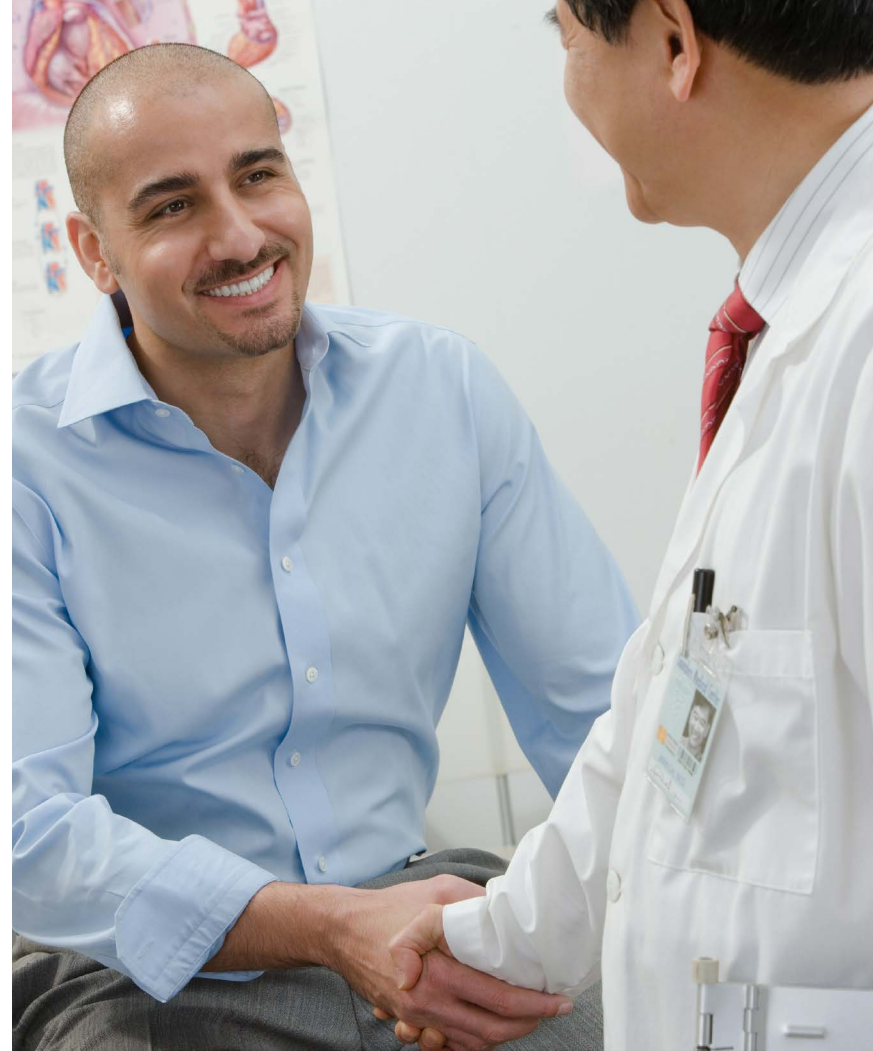
Healthcare systems will benefit from the increased speed and capacity 5G offers by being able to transmit large digital imaging files, expanding telemedicine for personalized preventive care, manage multiple patient care at the same time without slowing down the network, improve communication between medical specialists, and support decentralized medical systems including clinics, urgent cares, outpatient surgical centers and home health agencies.

Future innovations like connected ambulances, improved remote patient monitoring, robotic surgeries, and new virtual/augmented reality applications for clinicians will become more common place and a 5G network will be able to support these advancements.

# IMPROVE PATIENT EXPERIENCE

Offering secure, reliable, and ultra-fast connectivity, 5G enhances the patient experience while advancing the delivery of healthcare. Today, 67% of the largest U.S. hospitals provide mobile health (m-health) apps for patients while 61% of people have expressed their desire to have mobile access to their medical records. A 5G mobile broadband network is essential to provide this connected experience for improved patient outcomes and experiences. A key driver of patient experience is the ability for patients to remain connected to family and friends, their physicians and medical staff, and to information they need to make good healthcare decisions. People want to remain connected to the outside world. It doesn't matter if they are waiting for their appointment, visiting a loved one, recovering from a procedure, or participating in a program.

Improving patient experience and medical outcomes all begins with a wireless-first design where 5G is delivered with a fiber-to-the-edge (FTTE) architecture. A 5G network that is supported by a high-capacity fiber backbone provides the sub-1 millisecond latency that can deliver life-saving services for patients while connecting devices to keep patients connected to their family and friends. Corning's approach delivers a network at the lowest cost for hospitals as the infrastructure can be relied on for years, and often decades, to come.





## KEEP STAFF **CONNECTED**

Healthcare is facing an unprecedented staffing challenge. Organizations are finding it increasingly difficult to hire and retain both clinical and nonclinical personnel. This is a challenge that is expected to continue for the foreseeable future. Creating an environment that balances the needs of the business while also allowing employees to stay connected to their personal lives begins with an IT network that supports cellular devices throughout the organization.

**In the survey, *Cellular in the WorkPlace*, conducted by in-building cellular vendor Zinwave, it was found that healthcare workers were the most likely to complain of in-building cellular coverage.**

Unfortunately, healthcare facilities are notorious for poor cellular coverage. Many interior offices and hallways are in “dead zones” where there is no signal at all. This forces staff to go outside the building in order to use their device. This impacts operational efficiency and employee morale, two potentially expensive costs to the organization. Thankfully, the same infrastructure that provides patients with connectivity will solve staff connectivity. Enabling 5G coverage within the walls of your facility and throughout your campus will ensure staff can connect to loved ones wherever they are in the medical facility.

**If staff are not able to easily communicate with family, it adds unnecessary strain and stress to their job:**

- Staff with **young children** worry about not being reachable by schools and babysitters
- Staff who are **caregivers** (22% and growing<sup>3</sup>) worry about not being able to respond when their loved one is in distress





## ENABLE **NEW WORKFLOWS**

The third compelling reason to implement 5G in healthcare organizations is to support new workflows and operational procedures.

During the pandemic, many organizations implemented new workflows for patients waiting for appointments. Instead of asking them to sit in crowded waiting areas, those that could were asked to wait safely in their cars and would be contacted when it was their turn. Over time, organizations added the ability to register and check-in remotely, further improving time-to-serve and minimizing the transmission of illness.

To support the growing implementation of virtual waiting rooms, medical facilities need to have good cellular coverage in the immediate area around their facilities and offices to ensure patients receive the text or call. This includes areas that have traditionally been cellular “dead zones” like parking lots. Improved patient experience and operational efficiencies can improve as long as the individual can get the signal where they are waiting.

Other workflows that would be enabled with 5G include: interior and exterior wayfinding, advanced clinician communications, centralized inpatient monitoring, and real-time asset management.



FORWARD-THINKING  
ORGANIZATIONS ARE  
**INVESTING** NOW



# SUPPORT THE NEXT GENERATION OF CONNECTED MEDICAL DEVICES

The proliferation of the number of connected medical devices used by healthcare personnel to treat patients is growing rapidly. A 5G network allows for every healthcare organization to adopt and connect many devices to provide exceptional care. The Internet of Medical Things (IoMT) offers these benefits<sup>4</sup>:

- Improved diagnosis and treatment
- Improved disease management
- Enhanced patient experience
- Improved drug management
- Remote monitoring of chronic diseases
- Decreased costs

Infusion pumps are already connected to allow for remote monitoring and maintenance. Soon beds, gurneys, handwashing stations, and even consumables will have embedded technology that can send data to a centralized location for better tracking and monitoring. It is not a question of if, but when, it will become a necessity to have these connected devices.

Current connectivity infrastructure will be insufficient to handle the load of so many additional connected devices. Forward-thinking organizations are investing now in the infrastructure that they will need to support IoMT.



# GETTING STARTED

There are many compelling reasons for organizations to adopt 5G. Whether your goal is to improve patient outcomes and experiences while also creating an interconnected and efficient work environment for your employees or you want to focus on adopting new infrastructure to support innovative technologies in medical devices, or both, now is the time to start planning for a 5G implementation.







## CONDUCT AN INVENTORY OF EXISTING ASSETS

One of the best things you can do to get ready for 5G is to understand where your organization currently stands. That understanding only comes from an assessment of your current infrastructure and conducting an inventory.

Once you have collected this information, you will have a better understanding of what existing infrastructure can be used and what will need to be replaced. You will also have a cellular map of your facilities that will be very useful during your 5G implementation – you will know where signal is needed.

### Here are some questions to consider for your assessment:

- Where are the current DAS units located?
- How old are the current DAS units and what is the make and model of those units?
- What does an RF analysis tell me about my signal strength?
- Where are my “dead zones” and are they important areas for coverage?
- What is the daily maximum, minimum, and average network usage and load data?





## DOCUMENT **INTERNAL STAKEHOLDER NEEDS**

Adopting new technology just for the sake of the technology is never a good idea. Implementing new technology to address the needs of stakeholders, on the other hand, is always a good idea.

Document all the requirements, categorize and prioritize them according to your stakeholders' needs. Any common high-priority requirements are the foundation upon which you base your 5G initiative.





# CULTIVATE A **LEADERSHIP CHAMPION**

Having a 5G champion from the senior leadership team is an important success factor. There are so many departments that are impacted by 5G that it makes sense to have someone on the executive team that supports the initiative and can represent the team within the organization.





## MEET WITH **TELECOMMUNICATIONS PROVIDERS**

Before getting too deep in your 5G initiative, it is prudent to sit down with the telecommunication companies (Telcos) whose signal you would like to carry in your facilities. It is recommended to evaluate how many carriers you will need for your project and plan ahead. A multicarrier approach will provide the best experience for patients and employees alike who may all use different carrier services.





## DETERMINE AN **ECOSYSTEM OF PARTNERS**

No organization can implement 5G alone. You need a team of partners who can complement your internal resources. Bring in trusted partners who have experience with 5G who can help guide you through the process. Ensure that they are interested in more than just selling you hardware and that they will be there when you need them.





## RESEARCH **FLEXIBLE TECHNOLOGIES**

In healthcare, we must always be cognizant of costs. Everybody wins when we can deliver the needed functionality and address stakeholder requirements as efficiently as possible. When looking at 5G technology, it is important, therefore, to look for solutions that can not only help with 5G, but that can also be leverage for other organizational needs.



A **WIRELESS-FIRST**  
DESIGN **DELIVERS**  
A FUTURE-PROOF NETWORK





# ARE YOU READY

## TO GET STARTED?

The 21st century healthcare organization (HCO) is technologically advanced, where mobile connectivity is integral to daily operations like any other utility in the building. Patients today need reliable, ubiquitous mobile connectivity for making decisions about their health. Doctors and nurses need reliable mobile signals in the hospital for communicating and conducting their work. Hospital administrators need coverage throughout their medical campuses to efficiently and effectively implement new workflows to address changing market forces.

A wireless-first design where 5G is delivered with a fiber-to-the-edge (FTTE) architecture delivers a future-proof network at the lowest cost for hospitals as the infrastructure can be relied on for years, and often decades, to come. While delivering 5G today, the high-performance in-building fiber deployed will support emerging technologies in the future, ensuring the lowest cost-of-ownership in the long term.







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# IF YOU'RE READY TO BEGIN

Visit us at [www.corning.com/healthcare](http://www.corning.com/healthcare) to let us guide you on your 5G journey.

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