

# Next-Gen Networks:

## What 5G Means for Pharma

### Executive Summary

At this year's CES, Mobile World Congress, and on technology outlets everywhere, "5G" is a buzzword rivaled only by "AI." But what does it mean? 5G represents a fundamental shift in wireless communication networks.

The technology promises reduced latency, high speeds, and more connected ecosystems, and has implications in every industry, including healthcare.

This POV will outline what 5G is, why industries are rushing to adopt the next-gen tech, and discuss implications for pharma and healthcare brands.



### Background

#### HOW HAVE NETWORKS EVOLVED?

Before the era of the smartphone, there was no need for transmitting data, so cellular networks' primary function was voice communication. Early mobile data services were very slow and made dial-up look speedy in comparison.

As feature phones (a.k.a. "dumb" phones) evolved into smartphones, networks have evolved alongside them. Second-, third-, and fourth-generation wireless networks have given us texting, data capabilities, increased speed and higher capacity.

Our current 4G LTE (Long-Term Evolution) environments allow us to use mobile data to stream our favorite YouTube videos and Netflix shows from almost anywhere. We've now reached a tipping point – most users expect their binge-watching to

be in high definition with zero buffering. 5G will help enhance these mobile experiences and do so much more.

#### WHAT IS 5G?

5G stands for "fifth generation." We are currently in the fourth generation of wireless technology, so many of our devices connect to 4G or 4G LTE networks.

The technology for 5G is different from its predecessors, because 4G LTE technology is only capable of using lower-frequency bands. Since 5G operates at higher frequencies, consumers will see massive bumps in speed because it has support for higher data capacity. 5G is designed to supplement 4G networks rather than replace them entirely.

Something as powerful as 5G doesn't happen overnight. The major providers have been building the necessary infrastructure for some time. Thousands of smaller antennas are being deployed onto existing cell towers, lampposts, buildings and other structures.

The largest U.S. cellular networks are rolling out the first 5G plans throughout 2019. However, the technology may not go mainstream until 2020 and beyond, when updated chips are included in flagship phones – such as the iPhone – and infrastructure developments are complete.

In the beginning, two of the biggest positive factors for 5G will be the very fast speeds and the reduced latency.

#### SPEED

Implementation of 5G is being designed to offer speeds higher than 2Gbps at the start, twice as fast as Google Fiber's highest-speed plans. Development will continue to expand, providing improved bandwidth, scale and reliability.

Cellular networks and modem speeds vary, but the general consensus is that 5G will be up to 100 times faster than 4G. People will be able to load large webpages and download songs, videos, and apps in seconds.

## LATENCY

Latency is the lag or delay between when data is sent and when it's received. Gamers have talked about latency for years, because in fast-paced games like *Fortnite*, any delay between when the gamer attempts to take an action and when it actually happens can mean the difference between winning and losing.

5G networks have little to no latency in practice, so it will be especially effective in industries like healthcare where every millisecond can have great impacts.

In virtual-reality environments, high latency (longer delays) between moving the headset and the resulting screen movements can cause nausea or motion sickness. Even more importantly, low latency is crucial for real-time decision making in higher-risk tech like self-driving cars. A car travelling 75 miles per hour would travel ten extra feet before applying the brakes if the system experienced only a 100-millisecond [delay](#).



## Impact

The obvious and most visible impacts at first will be seen in cellular networks. Home and office internet will also soon see a boost, and 5G speeds will rival wired internet providers like cable.

Beyond making our mobile devices faster, real promise lies in the ability for 5G to connect environments, such as with the Internet of Things (IoT). [We've already talked](#) about how the ultimate usefulness of IoT will emerge as devices are able to make smart decisions based on AI engines that are a central hub for our homes. As 5G's greater bandwidth makes it easier for more devices to connect with one another and communicate at faster speeds, everyday things that we do not currently consider to be electronic devices will join the IoT.

5G will be a major boon for artificial intelligence (AI), since it enables faster inputs with more data, leading to easier real-

time decision making. AI requires large amounts of data to train models, so sending these large datasets for processing will become easier. Cloud computing also becomes more accessible with 5G.

Many healthcare applications also benefit from 5G technology:

- Wearables and ["insideables"](#) for healthcare become more connected, as well. For example, pacemakers that rely on real-time feedback and decision-making will see improvements with faster communication.
- MRIs and other imaging machines typically produce very large files and need to be sent to specialists for [review](#). Upgrading existing architectures to transport these files can improve both access to care and quality of care.
- Telemedicine requires networks that can stream video reliably, which typically means through wired networks. 5G may enable patients in rural settings who don't have wired networks to get faster access to treatment and virtually see specialists outside their area.

Other applications include insulin pumps that communicate with other medical devices and live, remote surgeries with no latency. In March, surgeons in China used 5G to perform successful brain surgery on a patient thousands of miles [away](#).

In short, 5G can help healthcare organizations meet the growing needs of their patients in an increasingly digital world.



## Considerations

While 5G shows great promise and potential, there are some considerations for the technology because it is relatively new.

Concerns about radiation have plagued the cell phone industry dating back to the age of brick phones. Research is ongoing, but [plenty of studies](#) have found little to no association between radiation from wireless tech and safety issues in humans.

Some of the critiques of 5G aren't inherently about the networks, but about what more connected environments

enable. Yes, there are hacking risks with connected TVs, thermostats, wearables and internal sensors. However, security researchers believe the benefits of IoT, particularly with implanted medical devices, outweigh the [risks](#). Nonetheless, as device manufacturers add 5G, companies should continue to enhance security in their devices.

As 5G and devices get better, more integrated and more secure, we'll be more comfortable connecting devices and allowing them to help make health decisions.

Our view is that the more immediate questions should be about whether we'll truly receive the full promise of 5G.

- What do business models and pricing look like as it is rolled out?
- How do we mitigate risks?
- How can healthcare and pharma best leverage 5G as it grows?
- Will there be additional FDA guidelines pertaining to 5G-enabled medical devices?

The infrastructure and rollout will take time, but we're optimistic about this technology. It won't happen this year, or probably even next year, but eventually 5G will be commonplace and our world will be more connected than ever. That will foster exciting opportunities for patients, healthcare brands and marketers alike.

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