Web Content Writing Sample

5G Connectivity Article Series

Dina Giolitto | dinagio@dinagio.com

5G Wireless Connectivity: What You Need to Know

5G Communications Rollout: An Overview

Unless you live under a rock, you've probably heard about the global communications network upgrade that is being rolled out starting in 2021.

In fact, even if you do live under a rock, you would have likely caught the buzz about 5G technology coming to a town near you anyway. The whole point of this stronger, faster communication signal is to reach remote areas and tucked-away spaces so that people can access the internet via their digital devices and have cell phone service at all times no matter where they are.

The overarching mission of 5G is to provide uninterrupted wireless connectivity to every user on the planet. We're all familiar with "smart phones" and how they work. In a 5G world, everything will be connected – not just phones and computers, but automobiles, aircraft, machinery, appliances and more. Long-term goals of 5G implementation include the following technological advancements:

- Smart cities – being able to connect on the go, from anywhere, with no interruption
- Virtual and remote work and learning opportunities
- Smart homes that include connected devices and appliances which "talk" to each other
- Smart vehicles – for programmable, autonomous driving, wireless connectivity for the transporation sector in general
- Smart/mobile business – including use of Virtual, Augmented and Mixed Reality applications as they apply to major industries including healthcare, industrial, communications, government, corporations, transporation, education, commerce, hospitality and more
- IoT (Internet of Things) implementation which means connected appliances, equipment, machines

5G Wireless Connectivity: What You Need to Know (cont'd)

How does 5G work?

To understand what this all means, it helps to have an overview of how cell phone towers operate. Picture a geographic area similar to a train layout - a radius of 40 miles -- with a variety of landscapes, roads, and communities.

Let's say this is the area where you live, work, and receive wireless communication service, viewed from above. The signal from a single cell tower would be broadcast and diffused over that limited, 40-mile range.

The problem with prior generations of wireless versus traditional wired communication is that the wireless signal becomes stronger when it's closer to the originating transmission point, meaning the cell phone tower, and grows weaker with increasing distance. 5G aims to fix this on a global level.

Another challenge is that historically, wireless signals haven't been able to reach areas blocked by certain structures such as buildings, trees and other obstacles.

You have likely experienced this firsthand when trying to use your phone in a moving vehicle, or attempting to make a call or use a computer inside of a building where the signal is obstructed by walls or by closely placed trees or other outdoor structures.

5G will revolutionize wireless communication to vastly improve connection speed, data transmission rate, sound quality and visual clarity.

5G stands for "5th generation cell phone technology" which refers to a new communications design and setup that will work to overcome the challenge of not being able to get a cell phone or internet connection in remote and obstructed areas.

5G will also increase speed of connectivity, improve clarity and expand the reach of wireless connectivity globally.

5G Wireless Connectivity: What You Need to Know (cont'd)

To get a clear understanding of what 5G or 5th generation wireless service will be like, envision satellite-like posts or communication hubs, where the signal from distant cell phone towers is drawn to a single location and then amplified and diffused within a smaller area in the general vicinity.

It's also possible as 5G technology gets underway, that some communications companies will phase out use of the larger cell towers and replace them with overhead communication satellites which transmit a signal to the shorter, more closely placed 5G towers.

If this gives you visions of that classic futuristic cartoon show The Jetsons, you may not be far off in imagining what's to come.

5G Wireless Connectivity: What You Need to Know (cont'd)

Understanding Bandwidth as it Relates to 5G Wireless

To get a real understanding of 5G wireless communications and how it's different, think of bandwidth. You've probably heard the hype about how 5G will get us more bandwidth. The new bandwidth will bring greater clarity, increased data exchange and faster connection speed.

Or, if you're of the conspiracy camp, maybe you've been led to believe that 5G bandwidth is something dangerous. There is global suspicion brewing surrounding the 5G rollout and why it seems to be happening so quickly. The fear is that 5G wireless antennas will increase our exposure to electromagnetic radiation and cause health problems.

What IS radiation? When you think of radiation, remember the word *radiate*. Radio waves are actually a form of light and they travel at the speed of light. Radiation is "the sending out of energy from any source." Radio receivers atract the signal via antennas. Cell phones use radio waves to transmit signals to and from previous generations of cell towers, called base stations.

5G technology will utilize microwaves which are one step up from radio waves in the electromagnetic bandwidth. The microwaves are shorter than what's been used thus far, but they transmit at a higher frequency which will work to increase clarity and greatly improve data transmission.

This is the reason why 5G will require antennas which are much closer together in order to route wireless signals without interruption.

According to LiveScience.com, radio waves are a limited resource as used by the communications industry, which explains the global technology race to bring 5G to communities.

SOURCE: http://livescience.com/50399/radio-waves.html

5G Wireless Connectivity: What You Need to Know (cont'd)

5G Concerns: A Perspective on Radiation Exposure

Wondering if the 5G communications rollout will spell disaster for the future of mankind? Or are you more concerned about property values potentially decreasing? The current buzz on 5G is that this new type of radiation in closer proximity could potentially pose a threat due to increased radiation levels. But is this real, or largely imagined?

We are exposed to radiation in various forms every day. On the electromagnetic spectrum, radio waves have the longest wavelengths and lowest frequencies which means they vibrate more slowly. Frequency is measured in Hertz. One vibration per second = 1 Hz.

SOURCE: http://scienceworld.ca

For a perspective, take a look at the basic order of electromagnetic waves on the spectrum; from longest, slowest waves to shortest, fastest waves.

In terms of protecting yourself and your family against the effects of radiation exposure on the body, you will notice that ultraviolet waves which come from our sun, rank at third level of intensity – one down from X-rays, and two steps down from deadly gamma waves – which explains the rampant use of sunscreen.

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About the Electromagnetic Spectrum:

The electromagnetic spectrum lists types of electromagnetic waves or radiation, from longest/lowest frequency (radio waves) to shortest wave with highest frequency (gamma waves).

They are ordered on the EM spectrum as such:

Radio waves -> Microwaves -> Infrared waves -> Ultraviolet waves -> X-rays -> Gamma waves

Putting this into perspective, with radio waves (and an advance to the use of microwaves with G5 technology implementation) being three levels down from the energy of our own sun, the need to limit exposure to radio waves is likely not quite as urgent as some would make it.

However, the fact is that we do not have enough information to determine whether this form of radiation in its intended presentation may impact health in an unknown way.

To get a better idea of radiation levels and compare radio waves on the electromagnetic spectrum, take a look at this diagram from Cancer.org: Radiofrequency (RF) Radiation (cancer.org)

SOURCE:
Radiofrequency (RF) Radiation (cancer.org)

Are radio waves and radiation the same thing? The answer is yes, radio waves are a type of radiation. Radio waves are classified as a non-ionizing type of radiation, which is claimed not to be a carcinogen or cancer-causing agent.

SOURCE: http://dummies.com/programming/ham-radio/basics-of-radio-waves/

5G Wireless Connectivity: What You Need to Know (cont'd)

Ionizing, or Non-Ionizing Radiation?

Before we get into ionizing types of radiation, let's cover what ionizing means. According to an article published in onhealth.com, ionizing radiation damages cells at the DNA level, resulting in genetic damage that can be passed down to the next generation.

Non-ionizing radiation causes excitation of molecules. However, its energy is not strong enough to remove an electron from an atom or molecule.

SOURCE:
https://www.onhealth.com/content/1/ionizing_radiation_fact_sheet

Radio waves and microwaves are classified as non-ionizing forms of radiation. Radio waves have been the historically used method of communication transmission for prior generations of wireless technology.

Millimeter waves will now be utilized going forward with 5G. Both are classified as non-ionizing which means they are not known to cause cellular mutations that lead to cancer.

According to Wikipedia, ultra-violet radiation from the sun is also classified as non-ionizing because the ionizing type of UV rays are filtered out by oxygen and other atmospheric gases.

Sunburn and melanomas caused by UV exposure are not considered a significant health risk. Ionizing radiation from radiation that has shorter rays and higher frequency, such as x-rays and gamma rays, result in burns, radiation sickness, cancer, and cell mutation.

SOURCE: Non-ionizing radiation - Wikipedia

5G Wireless Connectivity: What You Need to Know (cont'd)

"Scientific consensus shows that non-ionizing radiation is not a carcinogen and, at or below the radio frequency exposure limits set by the FCC, non-ionizing radiation has not been shown to cause any harm to people. Cell phones emit low levels of non-ionizing radiation while in use.

SOURCE: FDA

5G Wireless Connectivity: What You Need to Know (cont'd)

MM will be the Wave of the Technological Future

You may have caught wind of the word millimeter being bandied about in reference to the 5G communications rollout. What does this mean and how is it different from what we had before?

Radio waves in general classify as the longest waves in the spectrum but these can be broken down further into subcategories. We don't generally learn about millimeter waves when studying the electromagnetic spectrum in school. But these waves are classified as EHF (extremely high frequency) and fall on the spectrum between microwaves and infrared waves.

Millimeter waves are being used in broadcasting 5G communication data. Their signal is stronger than 4G bandwidth. However, millimeter waves reach shorter distances, requiring the use of closely placed wireless antennas which are part of the 5G tech rebuild.

According to this article on wfebb101.com that reflects what's been historically utilized on the cell broadcasting bandwidth, "Wifi transmits information from your device to a router and back again, using two different types of radio waves. One type is 2.4 gigahertz, and the other type is 5 gigahertz."

SOURCE: Why are radio waves used for communication (wfebb101.com)

As you might assume, the new cellular generation of millimeter waves which weigh in at 30 to 330 gigahertz, will create a much stronger (though shorter-range) communication signal that's expected to revolutionize wireless communication as we know it.

5G Wireless Connectivity: What You Need to Know (cont'd)

An article from LifeWire.com sheds some insight with the following explanation:

"Some examples of radio spectrum bands include extremely low frequency (ELF), ultra low frequency (ULF), low frequency (LF), medium frequency (MF), ultra high frequency (UHF), and extremely high frequency (EHF). "

On the electromagnetic spectrum, millimeter waves fall between microwaves and infrared waves, classifying them as EHF (extremely high frequency) waves on the radio spectrum band. To give you a perspective, 1 millimeter is about the size of a grain of rice.

"One part of the radio spectrum has a high frequency range between 30 GHz and 300 GHz (part of the EHF band), and is often called the millimeter band (because its wavelengths range from 1-10 mm). Wavelengths in and around this band are therefore called millimeter waves (mmWaves). mmWaves are a popular choice for 5G but also has application in areas like radio astronomy, telecommunications, and radar guns.

SOURCE: 5G Spectrum and Frequencies: Everything You Need to Know (lifewire.com)

To give you a comparison, if you've ever tried tuning in to AM radio you will notice the very low quality signal transmission. AM radio typically broadcasts a weak, fuzzy-sounding signal but the signal is carried from very far away.

AM radio is broadcast using a much slower band of radio wave on the spectrum and is classified as ELF (extremely low frequency). The waves used in AM radio broadcasting are wide and travel far distances, but at the lowest energy or frequency level. So imagine a contrast of that - millimeter waves, vibrating at an extremely high frequency, over a very short distance. That would mean clear, quick, strong signal transmission that doesn't travel far, thus requiring closely placed antennas. And this will be the defining characteristic of 5G.

5G Wireless Connectivity: What You Need to Know (cont'd)

What do 5G Towers Look Like?

5G cell phone towers have a distinct appearance that's different from former generations of ladder-like cell towers that you may have seen blinking from high above and far away in the night.

The poles of 5G structures are topped with a multi-pronged antenna, designed to magnetize cell phone signals from farther-away communications towers.

The new 5G towers are much shorter, sometimes as short as 50 feet; about the same height as residential electric poles that connect power lines. 5G towers can also be 150 to 200 feet tall, the same heights as high-tension power lines that cut through an open field and deliver electric power to neighborhoods.

The goal is to build in 5G structural components with the existing power lines - blending in with what's already there. The purpose is to utilize existing resources in a cost-effective way, with the least amount of disruption.

5G Cell Towers Appear Unique

5G cell towers look somewhat unusual. They feature a unique looking, multi-pronged structure at the top.

Fiber optic wires run from the mast to the prongs to form an antenna that attracts the communication signal and then amplifies and projects it to a more concentrated local region.

Curiously enough, in some areas of the United States the 5G towers are being disguised as trees. If you Google 5G images you'll find pictures of this technology. The poles have been designed to resemble palm trees with fake fronds protruding from the top. The pronged antennas feature as the centerpiece of this curious, and some would say hideous, sci-fi-like presentation.

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- 4G: Better, faster, more connectivity for enhanced functions using our smart devices. Memory has increased substantially. Music and video streaming as well as gaming are easy. We're able to run multiple apps at once. Cameras are HD, and battery charge lasts for days. 4G has ushered in the ever-expanding "smart" world that now encompasses homes, vehicles, and industries and will pave the way for major connectivity at a global level, with 5G.

- 5G: Speeds up to 20 times faster means connected cars, smart communities, and a supercharged industrial sector. The future is here!

SOURCE: The History and Evolution of the Smartphone: 1992-2018 (textrequest.com)

SOURCE: What is 5G? Benefits of 5G Network Technology Explained| About Verizon

5G Wireless Connectivity: What You Need to Know (cont'd)

Pros and Cons of 5G Technology

We are discussing the implementation of "5G" – the global-scale network communications overhaul of 2021, designed to deliver major improvements in both quality and speed of data transmission for users of wireless technology.

The goal is to utilize an untapped segment of bandwidth which will magnify and redirect the wireless communication signal into smaller spaces.

Bandwidth is defined by Mirriam-Webster's dictionary as "a range within a band of wavelengths, frequencies or energies especially; a range of radio frequencies which is occupied by a modulated carrier wave, which is assigned to a service, or over which a device can operate."

http://www.merriam-webster.com/dictionary/bandwidth

5G communications will operate at a higher-frequency band of the communications spectrum, creating a much stronger signal that travels faster, but over a much shorter transmission area.

The plan is to continue utilizing the broadcast capabilities of the older generation of cell phone towers, and then add in much shorter cell phone towers that amplify and diffuse the signal in areas where a better signal is needed. Older towers will eventually be phased out and replaced with communication satellites.

5G Wireless Connectivity: What You Need to Know (cont'd)

The new wireless communication system will remedy the following common problems of cell phone users in remote or obstructed areas:

- Complete lack of a signal
- Intermittent signal resulting in dropped calls
- Slower data transmission
- Signal interruption
- Disparity between upload and download times
- Reduced clarity with phone calls
- Difficulty streaming media

5G technology utilizes millimeter waves which pick up a much stronger signal and carry it faster but to a much more condensed region.

https://www.businessinsider.com/5g-high-speed-internet-cellular-network-issues-switch-2019

Those are the positives associated with 5G. Here are the negatives:

- 5G towers are not attractive. In some communities, the towers are being camoflauged as fake trees but they're still clearly visible even disguised as plants.
- 5G utilizes a new section of the wave spectrum which increases our exposure to radiation. Many people are concerned that this will create health problems.
- 5G delivers a stronger signal over a shorter distance, which means mini antenna type structures will need to be placed in close proximity. For those living in congested areas, this will increase exposure to radiation.

5G Wireless Connectivity: What You Need to Know (cont'd)

- 5G will require upgrade to new devices in order to work properly. During the transition to 5G, many people will continue to operate their devices using a 4G connection. They will need to specify the 4G setting on their existing phones. Otherwise, they're likely to experience connection problems.

- Some people have concerns that 5G will cause property values to plummet. Those who have health concerns about radiation exposure will not want to live close to 5G cell phone masts or mobile nodes.

5G Wireless Connectivity: What You Need to Know (cont'd)

5G Mobile Nodes Coming to a Town Near You: What Does it Mean?

Wondering about 5G? You may have noticed some different-looking poles have gone up in your town which are approximately the size of lamp posts.

These poles are referred to by the major communication networks as mobile nodes. They will serve as transmission points where the signal from a faraway cell phone tower can be captured, amplified and broadcast locally.

The purpose of 5G is to deliver better quality reception to all wireless users and overcome past challenges of cell phone technology.

The shorter poles will compensate for structural limitations that block the network's far-reaching communication signal, such as will typically happen in built-up urban areas.

This article is being written in the summer of 2021, and while many mysterious-looking tubular formations are showing up on street corners in urban areas, the technology is not yet active but soon will be. You'll find news coverage of this development available for viewing on YouTube.

Some residents of neighborhoods where mobile nodes have appeared are submitting formal complaints. Their concern is that radiation exposure from the closely-placed communications poles will increase cancer risk and create other health problems. It is also predicted that property values of the homes located in these 5G-ready areas will drop by 20%.

5G Wireless Connectivity: What You Need to Know (cont'd)

How can you tell if 5G technology will be coming soon to your hometown or area where you work?

If capped PVC poles about the length of street lamp posts have suddenly made their debut in your area, it is likely that the networks are rolling out phase 1 of the 5G technology conversion to your neighborhood.

You may also have spotted odd-looking prong-topped towers placed in open areas - including industrial space, agriculture fields, and sports and recreation fields. These are 5G cell towers that share space with high-tension power lines.

https://www.wcpo.com/money/consumer/dont-waste-your-money/what-are-those-strange-mystery-towers-popping-up

5G Wireless Connectivity: What You Need to Know (cont'd)

How is 5G Wireless Technology Different from Prior Generations of Communications Network Service?

5G is the nickname of 2021's next generation of cell phone towers that have already been released to the public and will continue to be systematically rolled out globally over the course of the next several years.

5G does not refer to gigabytes as one might think. It actually is an abbreviation for 5th generation cell phone technology.

5G cell phone towers differ from prior generations of cell phone towers by bringing that signal closer to us and amplifying it before broadcasting it locally. With wireless technology we have historically been challenged with trying to obtain a signal from a remote or congested area.

Older cell phone towers were built as much taller, standalone structures-- as high as 400 ft tall. The radio signal was broadcast from that very high point and covered as much as 40 miles of service area depending on the height of the cell tower in a specific area.

The benefit to this was that radiation emitted from the cell towers was still a safe enough distance away not to be of concern to residents in the area.

The disadvantage is that traditional cell phone towers come with their share of well known challenges. One, the signal does not always reach remote areas. And two, the signal can't permeate walls or wood structures including trees.

5G Wireless Connectivity: What You Need to Know (cont'd)

5G technology will remedy both of those issues, delivering a wireless communication signal that rivals our former wired telecommunications quality of service.

5G will also solve the issue that many users have of not being able to work virtually from certain locations. With the increase in the virtual work model there is a need for stronger cell phone signals so that people can connect whether they're at home, in their vehicles, virtually working or conducting business remotely via their cell phones and computers.

5G Cell Towers: Size Matters

With emergent 5G wireless technology set to increase signal strength and adapt to short broadcast range challenges that comes with millimeter bandwave technology, there has developed a need to position a variety of differently sized cell phone towers and masts within closer proximity to where people work and live.

As the 5G rollout gets underway, expect to see different sizes of cell masts popping up in and around your community. You will likely see the bigger 5G towers, topped with pronged structures and fiber-optics, being placed in open fields of the town where you live.

These towers pick up the signal from farther away. In addition to these, you'll also see smaller cell masts, placed near or close to electric wires and street lamps, which are about the same height as these. The smaller cell masts are needed to route the wireless connection around signal-blocking structures such as buildings and trees.

5G Wireless Connectivity: What You Need to Know (cont'd)

How tall are standalone cell phone towers?

Standalone cell phone tower height ranges from 50 to 400 feet tall. The tallest ones transmit at a radius of about 40 miles.

Fun fact: "cell" refers to the limited geographic area served with radio signals from one stand-alone tower. A "cell" is 40 square miles of service area.

How tall are 5G cell phone towers?

5G towers are about as tall as electrical power lines or trees. Height ranges from 50 to around 200 feet. They're built closer to our communities and business districts to bring wireless connectivity to these built -up areas.

This is accomplished by receiving the signal from farther-away cell towers, amplifying the signal and transmitting it locally.

5G towers utilize a different band of the radio wave spectrum than prior generations of cell phone towers. Some scientists and health experts object to the formation of these towers, claiming that they expose us to unsafe levels of radiation.

However, even with the increased use of smart devices and close proximity to cell masts, wireless radiation is still much farther down on the electromagnetic spectrum than ultraviolet rays, which we're exposed to every day. The type of radiation emitted is called non-ionizing, which means that it doesn't cause cellular damage or result in genetic mutation.

5G Wireless Connectivity: What You Need to Know (cont'd)

The 5G Controversy and What it Means to You

Whenever something new emerges with the potential for risk, half the people embrace the innovation and the other half respond with fear and opposition.

There is great controversy happening right now as to whether 5G is a needed advance forward in our increasingly technology-driven world or... if it is a form of military level population surveillance disguised as something useful.

Many conspiracy theories have popped up with recent attention on the new 5G cell phone towers that have suddenly materialized in the wake of the coronavirus pandemic, in cities all over the world. The project is well underway. New 5G towers are going up every day.

There's also something called nodes which first appeared in North Carolina in 2016 but which the citizens of Charlotte rejected in fear of health risks due to radiation exposure.

It is feared that the closer proximity of this new generation of cell phone towers, along with the more powerful signal strength, will create radiation exposure that reaches unsafe levels and results in harmful changes at the DNA level to human, animal and plant life.

In 2021 cellular nodes have returned, showing up on nearly every city street of Charlotte, North Carolina and other major cities globally. Sacramento, CA is another major city where the 5G rollout has been rapid despite objections from residents who have lodged formal complaints with local government officials.

It is expected that the communication transmitters will be stationed every 100 to 500 yards in urban areas similar to those listed above.

https://www.wcnc.com/amp/article/news/investigations/investigators/nodes-are-popping-up-all-over-charlotte-heres-why/

5G Wireless Connectivity: What You Need to Know (cont'd)

What's a mobile node, again?

According to techtarget.com, "A mobile node is an Internet-connected device whose location and point of attachment to the Internet may frequently be changed. This kind of node is often a cellular telephone or handheld or laptop computer, although a mobile node can also be a router."

Think of a cellular node as a network signal relay station. It's basically a life-sized wireless router.

5G nodes show up as poles, about the same height as a typical street lamp post, scattered throughout large cities where the population continues to increase and the need for greater connectivity exists as more people embrace the remote working and virtual schooling lifestyle.

The purpose of the non-functional mobile nodes that we see in cities as of 2021 is to eventually convert them to 5G cell signal technology.

The 5G nodes will work to route wireless communication on the milimeter band of the communication spectrum. Smart technology users can connect to the internet, make calls, use GPS and stream media with ease no matter their location throughout a city.

They can connect virtually from anywhere - the bathroom of their high rise apartment, a hotel conference room, the food court at the local mall, the bus stop, airport, or subway station.

5G Wireless Connectivity: What You Need to Know (cont'd)

Verizon's Ultra Wideband Says What it Is

Different communication networks will no doubt each have their own unique branding for the next generation of wireless global connectivity.

Verizon wireless has aptly named their 5G technology "Ultra Wideband" which references the increased bandwidth of the electromagnetic spectrum that will be required in order for this technology to work properly.

It is described on the Verizon wireless website as "A vast, dense network of towers and small cells" promising "ultra fast connectivity... with peak speeds of more than 2 gbps."

On their 5G page, Verizon also points out that a new generation of 5G phones will be required for users to get the 5G experience. Part of that experience will include faster streaming, greater clarity of images and high fidelity sound.

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5G Wireless Connectivity: What You Need to Know (cont'd)

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Does 5G Connectivity Pose Health Risks Due to Increased Radiation Exposure?

Along with the buzz of excitement that accompanies this next generation of more powerful cell phone and internet connectivity comes a new wave of fear.

It has long been established that exposure to certain wave frequencies can harm life. Radiation damages living cells and unfortunately the new generation of cell phone technology is based on increasing levels of it. However, the finer points lend a distinction, with this type of radiation being non-ionizing which means it won't cause burns, cancer or cell mutation.

Medical experts have long been aware of the potential damage resulting from exposure to radiation. This is the reason why we wear a protective lead covering when having our teeth or other body parts x-rayed, and why medical doctors limit the number of CAT scans that a person can safely have administered before reaching radiation levels that would physically harm their bodies.

Cell phone providers like Verizon are being transparent with the knowledge that advancing cell phone tower technology will utilize a different section of the electromagnetic field, namely millimeter waves which are more powerful than microwaves. However, it should be noted that the harmful radiation levels show up much higher than radio waves on the electromagnetic scale, past the UV radiation of natural light. Millimeter waves still technically categorize as a type of radio wave, though at an extremely high frequency. These are nowhere near the intensity of even our own sun.

5G Wireless Connectivity: What You Need to Know (cont'd)

5G wideband functions at a stronger wave frequency than microwaves.

While the majority of people living in developed countries have used microwaves for decades, there has long been concern over whether these pose a health risk. People who heat up food in a microwave are advised not to stand directly in front of the microwave order to avoid exposure to the radiation potentially leaking out.

You will come across many legitimate information sources online stating that microwaves do not cause cancer. But many people remain skeptical based on conflicting information.

Some fear that being one band up from microwaves, the new millimeter-wave based 5G technology poses increased health risks of radiation exposure. Some experts claim that even non-ionizing radiation such as this can negatively impact health.

These health risks include neurological changes that impact mental health, increased permeability of the blood-brain barrier, compromised immune system function, and endocrine changes that affect our reproductive function.

It's also feared that there will be an increase in the number of heart attacks.

Finally, some are concerned that radiation permeates the body through the skin which means the potential for a rise in the number of skin cancer cases, and an increase in cancer overall.

5G Wireless Connectivity: What You Need to Know (cont'd)

As far back as 2004, residents of Wishaw in the UK have complained of a variety of symptoms and health problems ranging from headaches to nosebleeds to cancer, as a result of living in too-close proximity to radiation-emitting cell phone masts.

According to the same article: "Alasdair Philips of the campaign group 'Powerwatch' has invented a device to detect mast emissions by converting microwaves to sound.

Alasdair insists that pulsing microwaves constantly bombarding the body are responsible for complaints of ill health.

'It's like a pneumatic drill going outside your house,' he explains.

'You can't hear it but your body cells are being impacted by this pulsing microwave radiation.'

Campaigners claim that the pulsing waves from the cellular masts interfere with electrical signals in the body, damaging the immune system."

http://www.bbc.co.uk/insideout/westmidlands/series6/phone_masts.shtml

Virtually distanced

According to this website, a distance of 500 meters (approx 1,640 feet) away from cell phone masts should prove helpful for residents trying to avoid cancer and other risks of radiation exposure.

http://www.es-uk.info/wp-content/uploads/2018/05/Adverse%2520Health%2520Effects%2520of%2520M.P.Masts%2520%26%2520Planning%2520Policy.pdf

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5G Wireless Connectivity: What You Need to Know (cont'd)

The difference between the prior generation of cell towers and the new ones that are going up is that older cell phone towers were taller and farther apart than the new 5G towers will be.

5G is meant to provide a stronger signal with the use of shorter towers that are able to send the signal at a shorter distance.

These new-generation cell phone towers are being built closer together in concentrated areas to remedy the problem of cell phone signals getting blocked out by physical objects such as trees, tall buildings, mountainous terrain and such.

The new and more powerful wireless connectivity is also meant to support future tech-based solutions such as:

- Increasing use of surveillance – such as traffic monitoring, security at stores and other public locations
- Self-driving vehicles and aircraft

5G Wireless Connectivity: What You Need to Know (cont'd)

- Automated robots for industrial and commercial use
- Virtual reality and augmented reality and mixed reality applications – as used in the healthcare, real estate, hospitality, and industrial sectors
- IoT or the Internet of Things – which means connected cars, smart appliances, lights, and other physical things that can connect and exchange real-time date via sensors

SOURCE: 5G networks for global commercial roll-out - Ericsson

Will 5G affect our health?

Greater connectivity has become a necessity in a newly-distanced, post-pandemic world. However, many people have concerns about how exposure to this different segment of the electromagnetic wavelength will affect human health including physical and mental health.

Some experts claim that the increase in exposure to electromagnetic fields can cause the following:

- Disruption of the nervous system, including negative effects on mental health and related symptoms
- Disruption of the endocrine system including interference with hormone production which could result in fertility problems and other hormone changes
- Disruption of the immune system posing greater susceptibility to illness or disease
- Strain on the heart
- Increased risk of heart attacks
- Increased risk of cancer

5G Wireless Connectivity: What You Need to Know (cont'd)

With the rapid rollout of this new plan designed to restructure the communications industry as we know it comes a litany of opposition around the globe from scientists who are aware of the potential risk of increased radioactivity may have on human health and on life on our planet in general.

The concern has resulted in some citizens going to extreme measures including attempts to destroy the 5G cell phone towers by setting the structures on fire. 2021 news coverage has captured images of these structures being burned.

People who are opposed to these conspiracy theories have come back with a hasty rebuttal that there exists no scientific evidence proving that the new 5G towers will cause health problems.

According to a statement published by the FDA, radio waves do not pose a known health risk: "Based on the evaluation of the currently available information, the FDA believes that the weight of scientific evidence has not linked exposure to radio frequency energy from cell phone use with any health problems at or below the radio frequency exposure limits set by the FCC. "

SOURCE: Do Cell Phones Pose a Health Hazard? | FDA

"In response to public concern, the World Health Organization established the International EMF Project in 1996 to assess the scientific evidence of possible health effects of EMF in the frequency range from 0 to 300 GHz. They have stated that although extensive research has been conducted into possible health effects of exposure to many parts of the frequency spectrum, all reviews as long as exposures are below the limits recommended in the ICNIRP (1998) EMF guidelines, which cover the full frequency range from 0–300 GHz, such exposures do not produce any known adverse health effect.[2]"

SOURCE: Wireless device radiation and health - Wikipedia

5G Wireless Connectivity: What You Need to Know (cont'd)

In 2011, International Agency for Research on Cancer (IARC), an agency of the World Health Organization, classified wireless radiation as Group 2B - possibly carcinogenic.

That means that there "could be some risk" of carcinogenicity, so additional research into the long-term, heavy use of wireless devices needs to be conducted.[3]

The WHO states that "A large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use."[4]

Another source found on Wikipedia claims the following in reference to their Group 2B classification of "possibly carcinogenic" exposure as related to cell phone radiation risk:

"The exposure circumstance entails exposures that are possibly carcinogenic to humans. This category is used for agents, mixtures and exposure circumstances for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals. It may also be used when there is inadequate evidence of carcinogenicity in humans but there is sufficient evidence of carcinogenicity in experimental animals.

SOURCE: The International Agency for Research on Cancer

5G Wireless Connectivity: What You Need to Know (cont'd)

How to Protect Yourself from 5G

The main conclusion on health risk as communication companies roll out their plans to implement 5G technology on a global scale is that there is no existing scientific proof that this new level of radio wave exposure comes with health risks.

What type of precautions can you take as a protective measure against the potential harm of increased radiation exposure from emerging cell phone technology which has not undergone sufficient testing?

Minimize your exposure

Long before the assumed threat of 5G exposure lived the concern of certain citizens that cell phones and computers expose us to harmful radiation.

While most people would agree it's a good idea to minimize the amount of radiation that we come in contact with on a daily basis, we are now dependent on our cell phones and on computers for nearly every aspect of our lives.

Is there a way to reduce your exposure to radiation when using your phone?

One trick that most people don't realize is they can switch their phone to airplane mode when not in use. You've probably seen the little icon shaped like an airplane at the top menu of your cell phone and in the settings.

Airplane mode is not just for airplanes.

Airplane mode is a one-click option that you can use to block the signal of your cell phone without having to go through a lot of steps.

5G Wireless Connectivity: What You Need to Know (cont'd)

Good times to activate airplane mode on your cell phone and limit unnecessary exposure to radiation include...

- When you're driving in your car and the phone is not in use. Not only will you be lowering your exposure to radiation but you will also conserve battery power of your device which is typically a problem.

- When editing documents from your smartphone or other device. If you use Google Docs, check off the box that makes a document available when offline. You can then compose or edit the text, then turn airplane mode back on when you're ready to share the document with other users.

- When using your smartphone as an alarm clock. Many people have traded their digital electric powered alarm clocks for setting an alarm on their cell phone. This makes it easy to get a reminder of appointments over the course of your day, but the phones also work well as a wake-up alarm. Protect your health by switching to airplane mode before going to bed in the evening.

- When exercising with your phone. No one likes to be interrupted in the middle of their exercise routine. So if you're walking or running at the park and have your phone on your person in case of a need to make contact, you can protect yourself from harmful radiation exposure and also give yourself that needed break.

- During outings or activities with your kids. We're all guilty of being distracted by our phones when in the presence of our children. How many times do you check your phone while sitting on a park bench at the playground, while your child bounces at the trampoline park, or while sitting in the dentist's office waiting area?

5G Wireless Connectivity: What You Need to Know (cont'd)

Reduce your exposure to radiation and practice being mindful for your loved ones. Things you can do besides checking your phone include bird watching, meditating, telling jokes, having a good conversation, reading a magazine, playing ball or even catching a nap.

There is an upside to wanting to reduce your exposure to potentially harmful exposure to radiation with a 5G cell phone technology rollout. The upside is that perhaps humans can better learn how to separate work and business from face time and be a little better about it.

Concerned about your physical proximity to 5g? Do your internet research homework. There is a plethora of websites in existence designed to help you track network connectivity by location. A quick Google search will pull up number of websites where you can view which carriers offer service in which regions, what types of cell phone towers exist in the area and what is scheduled for the future.

This type of technology has a number of advantages. It can be used to map out what geographic reason would be a desirable area to work and live. You can take a look at the type of connectivity offered in a specific region before deciding that you would like to move there.

You can decide on the purchase or sale of your home based on your level of need to be connected. If it's not your wish to expose your family to higher levels of radiation as put out by 5G towers, then you can be preemptive with your research and decide that you would like to relocate to a lower-risk area.

Currently, 5G technology is making its debut in densely populated urban areas. There is a financial component to this. Networks know that the money is where the people are, and the potential for growth is greatest in cities.

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5G Wireless Connectivity: What You Need to Know (cont'd)

Other Ways to Get the Scoop on Your Proximity to 5G:

It will help to do your on-the-ground research as well as make some considerations before you go forward with real estate moves as 5G gets underway. One way to do this is by hopping in the car to take a drive and scope out 5G towers in your area.

Where to look for 5G towers:

- Look for them located near or integrated with high tension power lines
- Search out open fields distanced from neighborhoods
- Drive past industrial complexes

In the interest of saving time and money, the goal of the communications companies is to utilize existing infrastructures which means that 5G will be integrated with what's already been built up in your area, such as existing power lines. Look for 5G towers to appear in these places.

If you live in a suburban or rural region, then you can likely control your own exposure to EMFs from cell tower radiation if that's your concern, at least for a few more years. Towers in these types of areas are being positioned away from where people work and live. The smaller antennas will likely not make it to quiet, sparse neighborhoods. Why? Simple: financial gain is limited for less populated areas.

Remember that the goal of communication companies is an uninterrupted global connection that greatly increases data exchange rate as well as speed of transferral. That's the long-range vision. However, for communication companies, the most money stands to be made in highly populated areas that will require more 5G mobile antennas.

The people who work and own businesses in these cities will view the change to stronger, faster connectivity as profit potential for their own companies. That means major cities get 5G first.

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5G Wireless Connectivity: What You Need to Know (cont'd)

Your Health Matters, and 5G isn't Going Away. So Here's What to Do

Although there is some amount of opposition to the rollout of 5G communications technology that started in 2021, the fact remains that our world has changed after global coronavirus pandemic. Technology as we know it is speeding along into the next realm of connectivity. We want wireless access no matter where we are.

People will likely continue to seek virtual work solutions. More children will be virtually schooled, and families and businesses will be looking into mobile solutions to fit their on-the-go lifestyle in a rapidly changing, technology-driven world.

Knowing that these technological steps forward are inevitable, you may wonder how to preserve your health with all of the hype surrounding potential risk from increased radiation exposure.

It is unknown whether the 5th generation of internet-connectedness will impact life on Earth as we know it. That said, whether or not the technology will become a part of your daily life does not change the fact that it's worth protecting your health no matter what happens.

Here are some ways to reduce your risk of illness and slow or halt the development of chronic disease as you age:

Increase your intake of antioxidants.

There are many sources of antioxidants. Any time a living substance is exposed to the air it begins to break down or oxidize. Free radicals form which cause cell destruction as a result of more rapid oxidation.

Some compounds hasten this process. Others halt it – these compounds are called anti-oxidants.

5G Wireless Connectivity: What You Need to Know (cont'd)

This also happens at a rapid rate with exposure to radiation which is the current global health concern. But we also know that it takes much higher levels of radiation to generate enough heat to create a burn or destroy cells.

Even in the face of conflicting information on the topic, increasing your intake of substances such as foods or supplements that contain antioxidants may help your body fight to cancer so you can live a longer, healthier life.

Antioxidants can be sourced from a great variety of plants including fruits, vegetables, grains and legumes.

Relieve stress.

It is said that stress is a killer but this statement is often lost on many due to its cliche nature. Here's an explanation of how stress breaks the body down over time. Your nervous system receives signals from the outside world and reacts to those signals as a means of preserving your survival.

When a perceived threat manifests, your nervous system goes into what's commonly known as fight or flight. It shifts from parasympathetic function to sympathetic function which means it is now operating on a reactive level.

Your nervous system is now sending messages to your body to speed up all processes in preparation to either fight or flight. Heart rate speeds up, breathing becomes more shallow, stress hormones release from the endocrine system and you receive a rush of energy in the form of adrenaline.

5G Wireless Connectivity: What You Need to Know (cont'd)

This primitive nervous system reaction was once essential to survival in the wild world. But thanks to widespread proliferation of technology, our phones now serve as a constant alert system for the nervous system to respond to.

Whether it's the vibration of a call coming in that turns out to be unwanted spam, a message coming in from your spouse while you're at a ball game, your phone beeping or ringing while you are driving in the car, OR emails coming in that interrupt your workflow, all day everyday we are bombarded with alerts that put our nervous system on overdrive and this is creating high levels of stress for our bodies.

So whether or not the cell phone tower is located more than 1600 ft away, and what spectrum level the radio waves in current use fall at may not really matter so much as the ill nervous system effects that cell phone dependence and smartphone addiction create.

With the goal of minimizing stress in your body both from increased radiation exposure and from the ongoing stressors of constant technology use, it's time for humans to seek mindfulness and ground themselves in activities that engage the mind and calm the nervous system.

Things like meditation, yoga, crafts, playing a musical instrument, writing with a pen, building something, cooking, painting, fixing something, and other hand on activities help soothe the nervous system and return us to parasympathetic nervous system function.

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5G Wireless Connectivity: What You Need to Know (cont'd)

More Ways to Reduce Radiation Exposure from Smart Devices:

Of course, any way that we can successfully reduce our dependence on smart phones is a very good thing. With so many options available for how and when we use our technology, remember that we still have a lot of freedom and control in terms of usage habits.

Simple ways to limit radiation exposure from your phone:

- Set to airplane mode when not in use.
- Avoid body contact with your smart phone.
- Text more, talk less.
- When taking calls, use a headset or speaker mode.
- Keep calls shorter in duration.
- Limit the amount of time kids spend using their smart phones.
- Switch sides when talking on your smart phone.
- If the signal is low, avoid using your phone.

You can also limit the amount of unproductive time spend using your smart devices. Try the following to help you lower your daily usage, cut down on data use, lower bills and limit exposure to radio wave signals via your phone:

- Route all push notifications to a junkmail designated email inbox.
- Disconnect messenger programs from having access to your contacts so they don't come in via text.
- Set time limits on your phone conversations.
- Communicate more thoroughly but much less often.
- Don't send an update that there's going to be an update.
- Go for quality, not quantity when using social media.
- Power off after hours.
- Watch movies on a TV rather than on your up-close smart phone screen.
- Write things down in a notepad instead of using your phone.
- Shop in physical stores sometimes instead of ordering everything online.

5G Wireless Connectivity: What You Need to Know (cont'd)

De-stress after 35 minutes of continued phone use:

- Take a walk or run.
- Stretch your body.
- Go outside.
- Meditate.
- Do a physical activity such as light cleaning, laundry, tending to garden plants, cooking, baking or organizing.
- Do eye exercises and stretches meant specifically for computer related tension and muscle strain/fatigue.

SUMMARY

1. Global 5G communication is underway - no going back.
2. 5G communication use the millimeter bandwith on the electromagnetic spectrum which is a higher frequency than before.
3. Some people oppose 5G due to to increase EMF exposure.
4. 5G communication provides faster, clearer connectivity over smaller spaces and around structures.
5. 5G towers are shorter and in close proximity like a life-sized router.
6. The potential for 5G to impact health is uknown - some fear the increase in exposure, others don't believe there is a risk.
7. Learn ways to minimize exposure to EMFs - including not living close to a cell tower; using airplane mode when your phone is on your person, and cutting down on time spent using your phone.

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