

Is Wireless Charging Safe?

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✓ Fact Checked

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STORY AT-A-GLANCE

- › Plans to install wireless chargers in public areas and on commonly used home furniture increase your risk of suffering health effects associated with mitochondrial dysfunction triggered by EMF exposure
- › Since nearly 77% of U.S. adults own a smartphone, up from 36% in 2011, phone manufacturers continue to search for ways to increase connectivity and phone use, including advances in wireless charging
- › Wireless charging uses an electromagnetic field to transfer energy from one object to another. A new type, the Pi Charger, expected to be on the market soon, releases electromagnetic fields into space and begins charging your battery as soon as you're in the same room
- › Wireless charging is less efficient than using a wire from the phone to the electrical outlet, and it drains electricity continuously, contributing to a drain on unused electrical power from always-on devices

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The Apple iPhone turned 10 in 2018, and in those short 10 years lives were significantly changed by smartphones. According to Pew Research Center,¹ nearly 77% of U.S. adults now own a smartphone, up from 35% in 2011. This makes the smartphone one of the most quickly embraced consumer technologies in history.

Interestingly, while smartphone ownership is more common among youth and those who are more affluent, rates are rising rapidly among older and lower-income Americans as well. When mobile devices were first released they were used for calling and texting. Today, Americans use their phones for a number of nontraditional activities, such as looking for a job, reading a book or getting GPS directions.²

In response to this growing desire to stay connected, mobile industries are designing more ways to keep your phone charged. In 2017 Apple announced the introduction of multiple-device wireless charging for their products in a never-ending quest for convenience.

One year later the pads had not yet shipped, ostensibly due to a problem with overheating that needed to be solved.³ Although this issue was problematic for Apple, wireless chargers and the future of Wi-Fi charging may create great obstacles in your desire for optimal health.⁴

How Does Wireless Charging Work?

Wireless charging, also known as inductive charging, uses an **electromagnetic field (EMF)** to transfer energy between two objects. This is accomplished using a charging station that sends energy through inductive coupling to an electrical device that can use the energy to charge the batteries or run the device.⁵

While there has been a burst of excitement about wireless charging for mobile devices, the technology actually existed in the late 1800s. It was invented by Nikola Tesla who originally worked with Thomas Edison on DC-based electricity.

Unsuccessful in his pursuit of improvements to the technology, Tesla began working on AC-based electricity instead. He then invented the Tesla coil, laying the foundation for wireless technology.⁶ The Tesla coil prototype is now on display at the Griffith Observatory, demonstrating on a large scale what's being done to charge your smartphone wirelessly.

The basic principle of transferring energy from one place to another remains the same. Called electromagnetic induction, a copper coil creates an oscillating magnetic field and a second coil converts the floating field back into energy again.

A second method, called magnetic resonance, allows transmission of power at greater distances by changing how much energy is stored in each coil and the coil size. In 2006, researchers from MIT proved they could transfer electricity up to 2 meters (6.5 feet) using magnetic resonance. Although 60% of the power was lost, their experiments enticed investors into further research.⁷

Today, there are two different methods of wireless charging. The first, the Qi Standard, uses the inductive method of small coils over short distances. This was created by a partnership of over 200 companies, including Apple and Samsung. The second type focuses on electromagnetic resonance. Previously known as Power Matters Alliance, AirFuel has been adopted by Duracell, Starbucks and Google.

A new innovation in wireless charging was released in 2017, called the Pi Charger.⁸ This device release electromagnetic fields into space and begins charging your battery as soon as you're in the same room. Chief technology officer Morris Kesler from WiTricity Corporation, the company working on magnetic resonance, imagines a future where wireless charging is ubiquitous, saying:⁹

"You drive your electric car into a garage, where wireless charging pads are on the floor. You open the door to the house and throw your cellphone on the kitchen counter, where wireless charging tech is built into the countertops."

Wireless Charging Is Less Efficient

Charging your phone wirelessly is far less efficient than using a dongle attached to a power plug. Before considering the safety involved with wireless chargers, which will increase EMFs throughout your home, it's also important to address the electrical drain these devices place on power plants.

Although it's easy to imagine there's an unlimited power supply coming to your plugs at home, electricity must be generated somewhere. The three major sources for electrical generation in the U.S. are **fossil fuels**, nuclear energy and some renewable energy sources, such as hydropower, wind energy and solar energy.

Today, renewable energy provides just under 20% of electricity while fossil fuels are the largest sources of energy production, totaling nearly 63%.¹⁰ It is estimated the amount of one of the fossil fuels, specifically coal, used to produce energy will rise as President Trump reversed energy policies in a move he framed as "an end to the war on coal."¹¹

However, burning coal to produce electricity increases air pollution linked to asthma, cancer, heart disease and lung disease. The problems also extend to acid rain and severe environmental and public health concerns as this energy comes at a tremendous cost.¹² The chemistry enabling coal to produce energy also produces a number of profoundly harmful environmental pollutants.

Vampire Appliances Contribute to Power Demands

The demand for energy only continues to climb. The typical American home is full of electrical vampires, describing devices that are always on and suck up electricity even when they're not in use. A report from the National Resource Defense Council (NRDC)¹³ found Americans are spending \$19 billion a year in electricity from vampire appliances and electronics.

This means the average household spends \$165 every year powering appliances not in use. Pierre Delforge, the report's author and NRDC's director of high-tech sector energy efficiency states:¹⁴

"One reason for such high idle energy levels is that many previously purely mechanical devices have gone digital: Appliances like washers, dryers and fridges now have displays, electronic controls, and increasingly even internet connectivity, for example. In many cases, they are using far more electricity than necessary."

In the past, major offenders have been TV cable boxes and video game consoles. Cable boxes are the second largest energy user in many homes as they're always running. Game consoles are also major power hogs.¹⁵

As more of the country and homes are moving toward wireless charging, these little devices will further add to the ever-increasing level of electricity the world demands, and at a cost to the environment and your health.

Future Plans for Wireless Charging Increase Health Risks

Wireless charging is available at hundreds of Starbucks across the U.S. and are also common at airports. In 2017, Apple announced it envisioned a world where many surfaces, including your bedside table and your car's dashboard, could have wireless charging docks.¹⁶

Each one of these chargers draws continuous power, which may be insignificant individually, but adds up when multiple surfaces have little magnetic fields radiating a charge.

WiTricity envisions being able to power your appliances at home without being plugged into the wall.¹⁷ They have partnerships with various manufacturers, including Toyota, with plans to eliminate the need for a plug to charge electric cars.

David Schatz, WiTricity's company vice president of sales and business, predicts people expect wireless electricity and believes state and local governments will follow. He said:¹⁸

"They're going to need to think about all the infrastructure that people need for charging things in public places, and how can they put in place policies and programs to incentivize and streamline the process for making this wireless power available everywhere, not only for mobile phones, but also for electric vehicles."

New technology has received FCC certification for power at a distance wireless charging using medium-range radio wave technology. The company, Energous, filed the FCC petition under Part 18, catering to industrial, science and medical devices, instead of Class B consumer electronics section. This may be due to the high power required to transmit energy over distance.¹⁹

Energous unveiled their first product partnership produced by Myant. Called Skiin, the smart underwear features integrated sensors to monitor your body's heart rate, activity, posture and hydration levels. Energous technology is included, fitting into Skiin clothing to support the company's midfield and far range charging transmitters when they become available.²⁰

In other words, not only do technology companies want wireless charging stations in public arenas, they are now partnering with clothing companies to design wearable EMF technology.

Wireless Charging May Reduce Your Smartphone Battery's Life

Wireless charging may also be bad for your device. Today, nearly 80 car models are offering in-cabin wireless charging based on the electromagnetic Qi (pronounced "chee") charging specification. These models include Audi, Chevrolet, Nissan and BMW. McDonald's, Marriott hotels and Ibis have built Qi into their properties.

Businesses like Facebook, Deloitte and Cisco have built Qi into their corporate offices. The number of devices enabled with wireless charging exceeds 200 million units a year and 25% of users have used wireless charging. It appears consumer demand for the feature and the volume of enabled devices is growing annually.

With greater ease of charging, Computer World²¹ asks if this is bad for your mobile device's battery. Venkat Srinivasan, director of Argonne Collaborative Center for Energy Storage Science, says that while you cannot overcharge a smartphone or a tablet, keeping it fully charged will reduce the life of the battery.

As a lithium ion battery charges and discharges, ions pass between a positive electrode and a negative electrode. The higher the battery is charged the faster the ions degrade, so it's better to cycle between 45% and 55%.

However, with an increasing number of wireless chargers, and midrange wireless charging on the horizon, it will be difficult to be in a public place without automatically charging your phone, thus reducing the life of an irreplaceable battery on your phone much more quickly.²² In other words, without the ability to replace the battery on newer phones, you'll be forced to buy a whole new phone, which is often a considerable expense.

Health Problems Associated With Wireless Charging Exposure

The primary health concerns with wireless inductive charging are the magnetic fields that they create. Safe fields are under 3 milligauss, but the lower the better, and the goal is below 1 milligauss. I found a study that showed the magnetic fields on the common Qi chargers and it was 1,000 milligauss or 1,000 times what you should be exposed to.²³

Fortunately, magnetic fields drop off rapidly and the 1,000 milligauss reading was taken at 2 millimeters (mm) from the device. When you increase the distance to 15 mm (a bit further than half an inch away) the reading drops to 50 milligauss. So, the warning here is you clearly don't want to sit on these devices, but if you keep them far enough away, a few feet or more, you should avoid most of the dangerous magnetic fields.

I personally don't own or use inductive charging so I can't measure it, but I am afraid it will be difficult to avoid as virtually all new cars have it as a feature. But, as the article states, there are many solid reasons to avoid using them.

For further discussion of the known health effects resulting from exposure to other types of EMF, see "['Wi-Fried' – Is Wireless Technology Dooming a Generation to Ill Health?](#)"

Sources and References

- ^{1, 2} Pew Research, June 28, 2017
- ³ The Verge, September 17, 2018
- ^{4, 14, 16} Treehugger, September 14, 2017
- ⁵ Computer World, March 28, 2018
- ^{6, 7} Forbes, September 26, 2017
- ⁸ TechCrunch, Pi Charging Raises \$11.4 Million to Fix Wireless Charging
- ⁹ Daily Dot, March 27, 2018
- ¹⁰ U.S. Energy Information Administration, Electricity Explained
- ¹¹ Washington Post, March 28, 2017
- ¹² Union of Concerned Scientists, Coal and Air Pollution
- ¹³ National Resource Defense Council, December 31, 2015
- ¹⁵ Treehugger, May 12, 2015
- ^{17, 18} GovTech, May 1, 2014
- ¹⁹ Android Authority, December 11, 2017
- ²⁰ Android Authority, January 9, 2018
- ^{21, 22} Computer World, Is wireless charging bad for your smartphone? March 28, 2018
- ²³ Bio Electro Magnetism September 25, 2017; 39(1): 83-85