

# Forget cellphones, wireless charging's best use is electric toothbrushes

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Wireless charging, as it turns out, is not most useful in cellphones. So far, it's been most efficient for electric toothbrushes, says a Ryerson University professor.

The reason it's so effective in the bathroom may explain why it hasn't caught on as hoped elsewhere.

"The brush is always in the stand," Xavier Fernando says as a way of explanation.

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Wireless charging radiates more energy than what actually reaches the device you're powering up.

The energy is lost in the air as it tries to find its way to, say, your cellphone. So it's inefficient and the only way for it to be more efficient is for a device to sit in one spot, which defeats the purpose, Fernando says.

With electric toothbrushes, unlike cellphones, "time is not a problem and electric toothbrushes don't need much energy," he adds, explaining that electric toothbrushes are charged using wireless technology (despite usually sitting on a stand) to avoid electric shocks caused by water.

There are two types of wireless charging: inductive and conductive. The former transfers energy across an electromagnetic field, allowing a gap

between the device and the charger. Conductive charging operates with coils that need to be in direct contact with the device. It's not so different from charging your device with a cable because it has to stay in the same position, but wastes less energy.

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Another factor inhibiting the industry from reaching the mainstream, experts say, is the fact that there is no real widely respected standard, despite attempts. Qi (pronounced "chee") is one of them. It was created by the Wireless Power Consortium and comprises a pad and receiver, most of the time, built inside the device. The standard covers a distance of 4 centimetres between the two.

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Samsung is building the technology into its phones and Ikea into some of its furniture, but it hasn't taken over the industry just yet.

Other standards include the Alliance for Wireless Power (A4WP) and wireless charger maker Powermat's Power Matters Alliance.

But Fernando says the ultimate standard is the U.S.'s Federal Communications Commission (FCC). It regulates the amount of energy

radiated from a device. Its limit affects inductive charging most because the more energy an inductive charger radiates, the further away a device can be to catch it.

He admits wireless is more convenient, but for now says there lacks a way to make the technology efficient enough for people to abandon cables.

“People have been talking about wireless charging for almost 10 years and it was never a big hit,” Fernando said.

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### **Charging is up in the air**

*What's the point of wearable tech if you have to take it off to charge it for hours at a time? These wireless recharging technologies aim to do away with down time, but for now, they're still up in the air.*

### **Radio waves**

Championed by Marty Cooper, inventor of the cellphone, wireless charging by radio waves is a technology that converts the radio waves in

the air into energy that can charge your batteries. Energo, the company supported by Cooper, is the main player on the market so far.

Whatever device that needs charging gets its juice from an Energo transmitter, WattUp, that can be up to 30 feet away and still charge the device. When asked whether the technology was safe, chairman and CEO Steve Rizzone said the transmitter produced close to the same amount of watts – one and a half – as a cellphone. “If your cellphone is safe, this technology is safe.”

Apple is rumoured to be adopting this for its iPhone 7.

## **Antennas**

Hundreds of tiny antennas fill Ossia’s cylindrical box called Cota. The company says Cota charges any device within 30 feet. It detects a device’s battery life and sends it power if it’s low. A chip inside a charging case transmits radio frequency signals that are picked up by the Cota. The company aims to create chips small enough so smartphone makers can insert them into their phones directly so you won’t need the bulky case. It plans to sell to the public by the end of the year.

## **Sound waves**

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UBeam’s technology also uses a transmitter and waves—except they are sound waves and the transmitter emits inaudible “high frequency sound” (ultrasound), according to the company’s website. That sound is caught by a receiver up to 15 feet away that acts kind of like a microphone and converts the sound into energy.

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### Laser beams

Israeli startup Wi-Charge’s promise is to charge devices at a distance (up to 30 feet) as fast as a USB or wall plug would — using, yes, laser beams. It says it operates like a computer mouse’s beam, TV remote or laser printer. The beams could be extremely dangerous because of their focused nature, but the company says it found a way to stop the beams when an object (or human) blocks them.

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