

Encouraging teeth to self-repair

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Dentists could soon be giving your teeth a mild 'time warp' to encourage them to self-repair, thanks to a new device being developed by dental researchers. Reminova Ltd, a new spin-out company from King's College London, aims to take the pain out of tooth decay treatment by electrically reversing the process to help teeth 'remineralise'.

With 2.3 billion sufferers annually, [dental caries](#) is one of the most common preventable diseases globally. Tooth decay normally develops in several stages, starting as a microscopic defect where minerals leach out of [tooth](#). Minerals continue to move in and out of the tooth in a natural cycle, but when too much mineral is lost, the enamel is undermined and the tooth is said to have developed a caries lesion (which can later become a physical cavity). Dentists normally treat established caries in a tooth by drilling to remove the decay and filling the tooth with a material such as amalgam or composite resin.

Reminova Ltd takes a different approach – one that re-builds the tooth and heals it without the need for drills, needles or amalgam. By accelerating the natural process by which calcium and phosphate minerals re-enter the tooth to repair a defect, the device boosts the tooth's natural repair process. Dentistry has been trying to harness this process for the last few decades, but the King's breakthrough means the method could soon be in use at the dentist's chair.

The two-step method developed by Reminova first prepares the damaged part of the enamel outer layer of the tooth, then uses a tiny electric current to 'push' minerals into the tooth to repair the damaged site. The defect is remineralised in a painless process that requires no drills, no injections and no filling materials. Electric currents are already used by dentists to check the pulp or nerve of a tooth; the new device uses a far smaller current than that currently used on patients and which cannot be felt by the patient.

The technique, known as Electrically Accelerated and Enhanced Remineralisation (EAER), could be brought to market within three years.

The company is the first spin-out from the King's College London Dental Innovation and Translation Centre which was launched in January 2013. This centre was formed to take research and novel technologies and turn them into products, change practice and inform policy which will improve health and healthcare internationally.

Reminova Ltd will be based in Perth, Scotland to benefit from the strong life sciences and dentistry base. It will commercialise the work of Professor Nigel Pitts and Dr Chris Longbottom, based in the Dental Institute at King's College London. With a combined 80 years' experience in dentistry they have previously brought dental devices to market to detect tooth decay. The company was formed in collaboration

with Innova Partnerships, who commercialise healthcare and life science enterprises.

The company is currently seeking private investment to develop their remineralisation device.

Professor Nigel Pitts from the Dental Institute at King's College London said: "The way we treat teeth today is not ideal – when we repair a tooth by putting in a filling, that tooth enters a cycle of drilling and re-filling as, ultimately, each "repair" fails.

"Not only is our device kinder to the patient and better for their teeth, but it's expected to be at least as cost-effective as current dental treatments. Along with fighting tooth decay, our device can also be used to whiten teeth."

King's Health Partners Academic Health Sciences Centre is one of the founders of MedCity, launched by Mayor of London Boris Johnson in April this year to attract investment and promote entrepreneurship in the London-Oxford-Cambridge [life sciences](#) 'golden triangle'.

Congratulating Reminova, Kit Malthouse, Chair of MedCity and London's Deputy Mayor for Business and Enterprise, said: "It's brilliant to see the really creative research taking place at King's making its way out of the lab so quickly and being turned into a new device that has the potential to make a real difference to the dental health and patient experience of people with [tooth decay](#).

"Increasing the rate at which we can turn great ideas into successful medical and healthcare companies is one of the key aims of MedCity, and will have huge benefits for the UK's health and well-being, as well as its economy."

Provided by King's College London

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