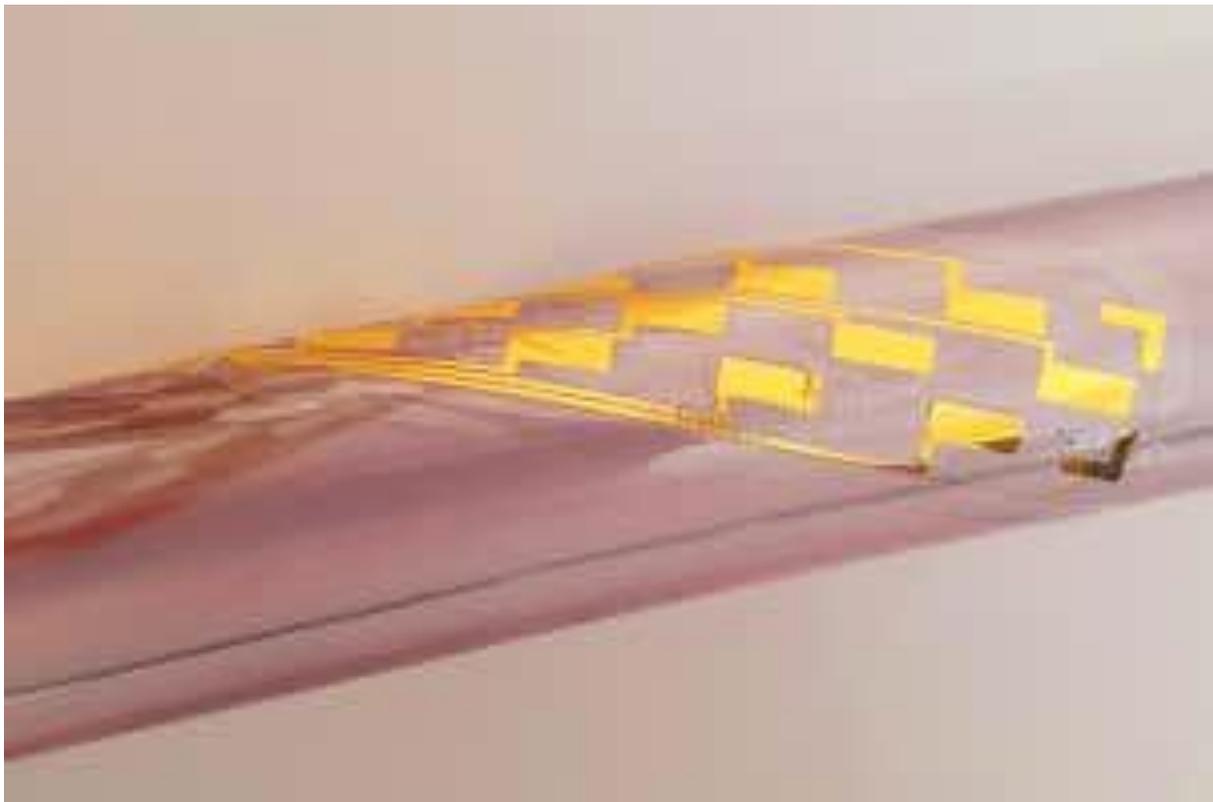


Inflatable implant injected into the spine could relieve chronic pain

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By [Christa Lesté-Lasserre](#)



A tiny, inflatable implant that can be injected into the spinal column could provide long-term relief from [chronic pain](#). It works by emitting electrical charges that signal the brain to stop perceiving the pain.

Spinal cord stimulation to control chronic pain in the body, arms or legs isn't new, but its effectiveness has been hampered by practicality issues, says Damiano Barone at the University of Cambridge. In order for such devices to work well, they must have up to 32 electrodes that snuggle up to the spinal cord.

That requires a relatively large implant, measuring about 12 millimetres wide, which requires complex surgery under [general anaesthesia](#). It also carries risks, like spinal cord damage, and involves removal of part of the spinal column – factors that might outweigh the benefits of such an implant.

Now, Barone and his colleagues have developed an inflatable device that would only necessitate minimal surgery under local anaesthesia. It is made of ultra-thin plastic and pure gold sheets, rolling up to a thickness of less than 2 millimetres – so small, it can fit inside a moderately-sized needle.

It is designed to be injected into the epidural space – a region around the spinal cord that is targeted by anaesthesiologists for people in labour – then unroll and fill out when pumped up with a few millilitres of air, like a tiny camping mattress. It could be powered by an implanted battery and charged via induction, like wireless charging of a smartphone.

The researchers tested their device using a water balloon to serve as an artificial epidural space. Then Barone, a neurosurgeon, practised injecting the device through a needle into the lower back of six human cadavers.

It was easy to implant and rolled out fully, fitting itself over the spinal cord. The team estimates that the risks would be similar to those associated with epidural pain relief for people in labour, approximately a 1 in 100,000 risk of complications like a blood clot.

“Even at its maximum diameter it still appears safer than what’s already out there, which is already pretty safe,” Barone says, adding that further testing is necessary.