

# Doctors successfully implant synthetic larynx piece into two patients

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Harvard Bioscience "InBreath" Bioreactor with synthetic laryngotracheal scaffold seeded with patient's own cells

(Medical Xpress) -- Doctors working at the Karolinska University Hospital in Stockholm, have for the first time, successfully implanted a synthetically grown integral part of the human larynx into two live human patients, restoring their ability to speak. The groundbreaking procedure is considered to be the first step towards creating an entire larynx using scaffolding and stem cells to replace a natural one damaged by accident or disease.

The [larynx](#), also called the [voice-box](#), is an organ in the throat that houses the mechanism involved in speech. It also helps direct breath

flow and aids in preventing food or other objects from entering the trachea. At the base of the larynx between the parts that contribute to speech and the trachea is a collar shaped piece of windpipe called the cricoid arch and plate. Its job is to form the outer wall of the lower larynx. Because of its location, it is oftentimes crushed when people involved in car accidents have their throat thrust against the top of the steering wheel. That's what happened to the two patients who received the new lab grown parts from the international team of doctors working together on the new procedure. Both of them lost the ability to speak as a result.

To create the new part, a group of researchers working at Harvard Bioscience in the US first built a scaffolding out of a synthetic material. They then applied stem cells taken from the bone marrow of the patient who was to receive the [implant](#) and caused them to attach in a special reactor box. Because the stem cells came from the patient, their bodies won't react by trying to reject the foreign part. The same team led by Doctor Paolo Macchiarini implanted a synthetically grown [trachea](#) into a patient last summer and all indications are that it was a success as well.

Implanting synthetic organs or parts of them is new science. Currently, other medical procedures used to restore speech to damaged organs have relied on harvesting parts from cadavers, which of course means the patient will have to deal with rejection issues for the rest of their life.

Macchiarini and his team, in conjunction with others such as those at Harvard Bioscience, all agree that such procedures are just the first step. The ultimate goal is to build an entire synthetic larynx from scratch that will function just as well as a normal one, restoring speech to those that suffer from any ailment of the voice box; a goal that is likely to take decades to achieve due to the intricacy of the larynx and all its moving parts.

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