

# Corneas bioengineered from pig collagen can restore sight

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**In news**– For the first time, researchers in Sweden have been able to create a successful alternative bioengineered cornea implant made of collagen derived from pig skin.

## **Key findings-**

- Under the study, **a bioengineered cornea implant was used to successfully restore the vision of 20 people in India and Iran**, most of whom were blind due to keratoconus, a disease that leads to thinning of the cornea.
- Researchers claim that there is a severe shortage of corneas, with only one available for 70 patients.
- **As a substitute for human corneas, the researchers utilised medical-grade collagen derived from pig skin, a byproduct of the food industry** that is already used in medical devices for glaucoma surgery.
- This is not only cheaper and easier to access than donated corneas, but **requires a less invasive procedure** and can be stored for a significantly longer period up to two years.
- The **researchers developed a minimally invasive method without the use of stitches**, where a small incision is made in the patient's eye, and the implant is inserted over the existing cornea.
- This can be done with high-precision lasers or by using readily available surgical instruments.
- This new method was used by surgeons in India and Iran, where there is a lack of donated corneas.
- Not only was the procedure safe for all 20 participants, the researchers found that 2 years after the operation,

none of the patients were blind anymore

- The results show that it is possible to develop a biomaterial that meets all the criteria for being used as human implants, which can be mass-produced and stored up to two years and thereby reach even more people with vision problems.

### What is Cornea?

- The cornea is **a transparent avascular tissue that acts as a structural barrier and protects the eye against infections.**
- Along with the tear film, it provides a proper anterior refractive surface for the eye. It **contributes to two-third of the refractive power of the eye.**
- **Damage to the cornea, the clear, outermost layer of the eye is one of the leading causes of blindness across the world,** leaving approximately 12.7 million people blind, and particularly affecting those in poorer countries where there is a scarcity of donated human corneas.

### Note:

- Keratoconus occurs when the cornea, the clear, dome-shaped front surface human eye thins and gradually bulges outward into a cone shape.
- A cone-shaped cornea causes blurred vision and may cause sensitivity to light and glare.
- **Keratoconus usually affects both eyes, though it often affects one eye more than the other.**
- It generally begins to affect people between the ages of 10 and 25. The condition may progress slowly for 10 years or longer.