

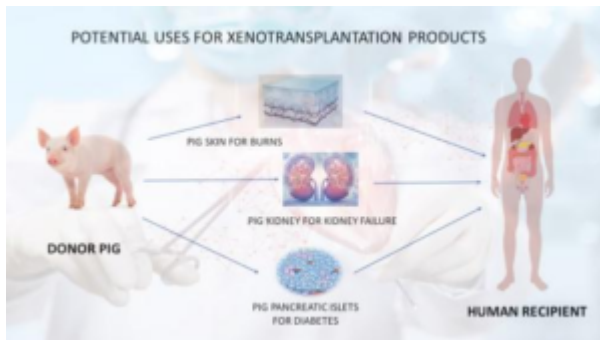
# What is xenotransplantation?

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**In news**– Recently the doctors in the USA transplanted a genetically altered pig heart into a patient which is referred to as xenotransplantation (from animals to humans).

## **More information on xenotransplantation-**

- Xenotransplantation is any procedure that involves the transplantation, implantation or infusion into a human recipient of either live cells, tissues, or organs from a nonhuman animal source, or human body fluids, cells, tissues or organs that have had ex-vivo contact with live nonhuman animal cells, tissues or organs.
- Such cells, tissues or organs are called xenografts or xenotransplants.



- Xenotransplantation of human tumor cells into immunocompromised mice is a research technique frequently used in pre-clinical oncology research.
- Human xenotransplantation offers a **potential treatment for end-stage organ failure**, a significant health problem in parts of the industrialized world.
- It also raises many novel medical, legal and ethical issues.

## **Some of the examples of xenotransplantation**

- In 1921, Frederick Banting and his assistant Charles Best extracted insulin from dogs for the first time.

- In the years that followed, experts began extracting this hormone from the pancreas of pigs and cows.
- In September 1965, scientists successfully replaced the aortic valve in a human with a porcine one for the first time.
- Heparin, is an anticoagulant that keeps blood clots from forming during surgery and is sourced from pigs.
- In 1984, a human infant received a heart from a baboon, but she died 21 days after the transplant.
- In 1997, two surgeons – Dr Dhani Ram Baruah, a transplant surgeon from Assam, and Dr Jonathan Ho Kei-Shing, a Hong Kong surgeon conducted a pig-to-human heart and lung transplant in Guwahati on a 32-year-old farmer, Purno Saikia.
- However, the transplantation was not successful.
- In 2017, Scientists had developed a human-pig hybrid by growing human cells inside early-stage pig embryos in the lab.
- In 2017, Chinese surgeons reportedly transplanted pig cornea to restore sight in a human.
- In 2019, experts from the US announced that live cell, genetically engineered pig skin could temporarily close a burn wound.
- In 2020, US experts attached a genetically-altered kidney to a brain-dead person and monitored the new organ for the next 54 hours.
- The next breakthrough was the latest pig-heart transplant that was granted authorisation by the US Food and Drug Administration after reviewing experimental data.