

## Aortic Valve Template



**Problem Statement:** More than 60,000 open-heart surgeries are performed annually in India, mainly for coronary and valvular heart disease. The current method to create an aortic valve from a patient's pericardium during surgery is inaccurate and not standardised. Measurements of the valve are taken manually, making it slow and cumbersome. The researchers have designed a solution specifically for the Indian population to overcome these challenges. This solution is a surgical tool to create an accurate profile of aortic valve leaflet from a patient's own pericardium tissue for valve replacement surgery.

**Uniqueness of the Solution:** As this research offers a solution to use the patient's pericardium to create the heart valve leaflets, it avoids the need for artificial valves. Based on the age of a patient, different sizes of the tools designed are selected to cut the parabolic shape of the aortic valve leaflet. The use

of this tool reduces the manual error, need for high skill and time required for such a surgery. In addition, post-surgery medications (that have side effects) can also be reduced.

**Current Status of Technology:** The researchers have manufactured the functional prototype of the device. The preclinical testing of the aortic valve template has been carried out. The researchers have ensured the biocompatibility of the material used for manufacturing the device. Cardiac surgeons from renowned hospitals in Mumbai are currently testing this solution.

**Societal Impact:** The product reduces the surgery time, the cost of the surgery and also the number of medications required post-surgery. Thus the surgery is made more affordable for everyone. It also reduces the chances of infections as compared to mechanical valves as the patient's own pericardium is used. Thus the solution improves the well-being of

patients undergoing valve replacement surgery.

**Patent(s):** Filed

**Relevant Industries:** Healthcare, Medical Devices, Biomedical Engineering.

**Faculty:** Prof. Bhallamudi Ravi, Mechanical Engineering.