

Transcatheter Aortic Valve Replacement (TAVR)

**A
Knife-less
Suture-less
Surgery**



*In the picture (clockwise from top-left):
Evolut R (Medtronic), Sapien 3 (Edwards),
Hydra (SMT), Myval (Meril)*

Patient Education Series
Cardiology clinic, 3rd Floor, B-wing
KIMS Hospital, Block III
Secunderabad

Introduction:

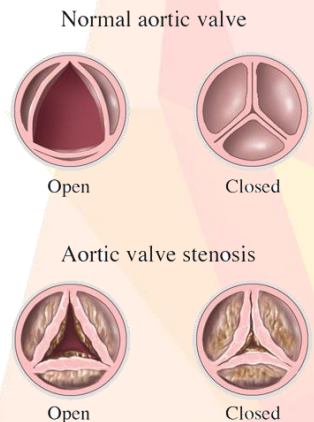
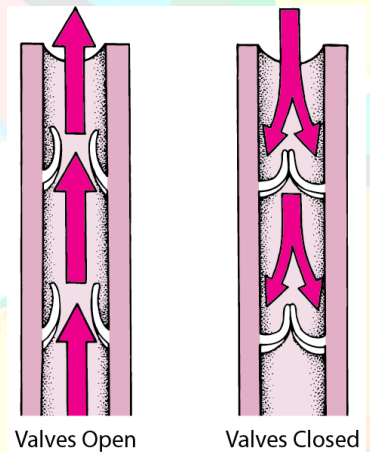
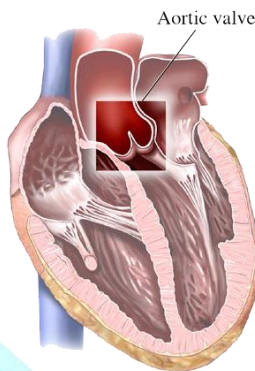
Human heart has 4 valves. They all share the same basic purpose: to allow unrestricted unidirectional blood flow (Figure→). If a valve fails to open properly, condition called ‘stenosis’, it leads to blood flow impediment. If a valve doesn’t close tight, it leads to blood leaking back, called ‘regurgitation’.

Heart valve starts beating before birth and continues to do so, at least 1 lakh times per day, till death. It is expected for the valves to have some wear and tear over time, often seen as valve thickening and deformation which may lead to minor stenosis or regurgitation. At times, it becomes severe leading to extra workload to the heart muscle. The heart tries to compensate for this added demand, but eventually gives way leading to heart failure and eventual demise. Replacing a malfunctioning valve with an artificial well-functioning valve may restore a normal heart function.

Aortic valve is strategically located at the exit-point of the heart. It regulates blood flow from the heart to rest of the body. Abnormalities of the aortic valve can lead to ‘Aortic-stenosis’ or ‘Aortic-regurgitation’.

Aortic valve stenosis, if severe, can lead to multiple issues:

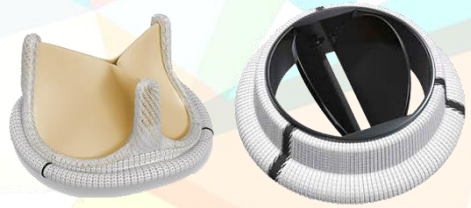
- Breathing difficulty
- Chest discomfort
- Dizziness, giddiness
- Syncope (loss of consciousness)
- Easy fatigability
- Rapid heartbeat
- Leg swelling
- Heart failure (inability of the heart to do its job)
- Eventual death



Replacing a diseased aortic valve with a functioning artificial valve not only improves symptoms, it also increases life expectancy.

Surgical Aortic Valve Replacement (SAVR)

Traditional treatment of severe aortic stenosis involves open-heart surgery where the chest is cut open, allowing access to the diseased aortic valve. The surgeon removes the old valve and replaces it with a new artificial valve (→). Surgical valves can be bioprosthetic (made up of animal tissue) or metallic, housed inside a rigid frame.



Artificial valves (tissue, metallic) used during SAVR

Transcatheter Aortic Valve Replacement (TAVR/TAVI)

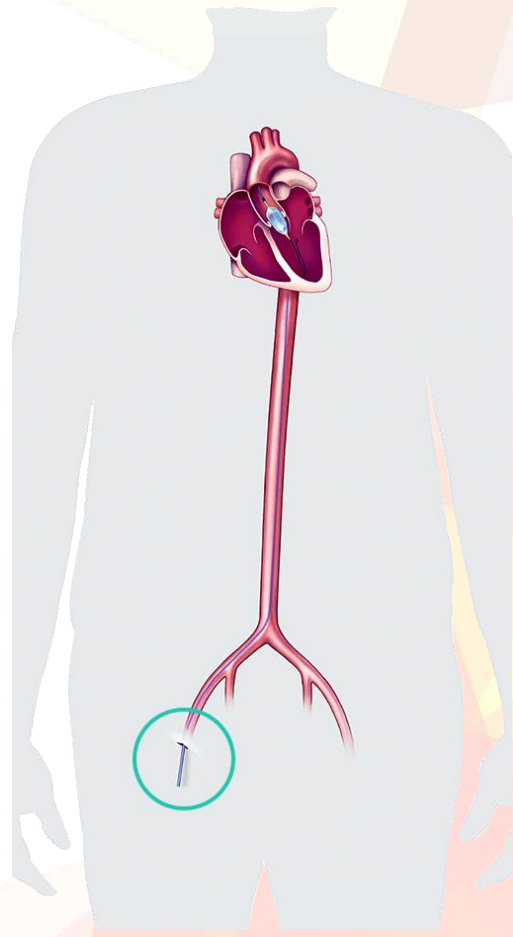
A procedure where diseased aortic valve is replaced by a new artificial valve, without any need for major surgery. A special valve is squeezed inside a small plastic tube (called catheter). Via a small incision at the groin, the catheter is funnelled up to the heart where the squeezed valve is revealed back to its original shape.

Salient features of TAVR:

- Similar to an angioplasty
- Performed in the cath lab
- Takes less than an hour to perform
- Does not require any major cut or skin suture
- No need for general anaesthesia or ventilator
- Quick recovery: 24 hours in ICU, 2 days in the hospital
- Resume activities immediately after discharge

Ideal patient for TAVR:

- Age >60-65 years
- Severe aortic stenosis confirmed
- Has features that put them at higher risk for open heart surgery



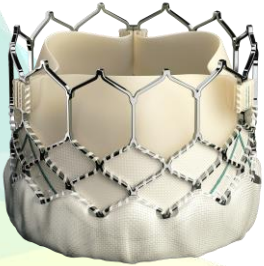
TAVR valves currently available in India



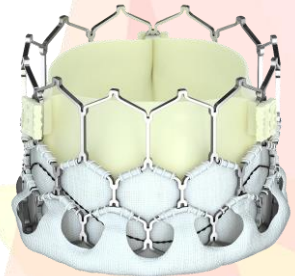
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Company: Medtronic Inc.
Country of origin: USA/Global
Design: Self Expandable
Approved in India: Yes



Model: Hydra
Company: SMT
Country of origin: India
Design: Self Expandable
Approved in India: Yes



Model: Sapien 3
Company: Edwards Lifesciences
Country of origin: USA/Global
Design: Balloon Expandable
Approved in India: Yes



Model: Myval
Company: Meril Lifesciences
Country of origin: India
Design: Balloon Expandable
Approved in India: Yes



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