

THE VALVES

Checking replacement valves

Valve function will depend on the position, size, type, and implantation technique.

- As a general rule, assess a replacement valve using the same methods as you would the equivalent native valve disease, but also check for paraprosthetic regurgitation, which will be outside the valve.
- Almost all replacement valves are more obstructive than a native valve.
- Mild regurgitation through a replacement valve is usually normal.
- Look for cusp thickening and reduced mobility but these can be difficult to see.

- Mechanical valves are especially difficult to scan because they cause artifactual echoes, so a TEE may be helpful, especially for mechanical mitral valves.
- Biological replacements usually deteriorate slowly, but occasionally a cusp tear can cause sudden severe regurgitation.
- A change from baseline measurements is the most useful guide.

If you don't have a baseline study to demonstrate deterioration in function:

Mitral valve replacements

Suspect replacement valve obstruction in the mitral position if the pressure half time >200 ms with a peak velocity \geq 2.5 m/s, there is a narrow forward jet on color Doppler, and increased pulmonary artery systolic pressure.

Aortic valve replacements

Suspect replacement valve obstruction in the aortic position if the velocity through the valve > 4m/s, mean gradient >35 mmHg, and there is a narrow forward jet on color Doppler.

Tricuspid valve replacements

Suspect replacement valve obstruction in the tricuspid position if the velocity through the valve >1.6 m/s, mean gradient >6 mmHg, pressure halftime >230 ms, there is a narrow forward jet on color Doppler, and you note a dilated IVC.

Pulmonary valve replacements

Suspect replacement valve obstruction in the pulmonary position if the velocity through the valve is >2 m/s for homografts and > 3m/s for other types, there is a narrow forward jet on color Doppler, and you note an impaired right ventricle.

References and further reading:

- 1. Nishimura RA, Otto CM, Bonow RO, et al. 2014. AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* **63**:2438–88.
- 2. Vahanian A, Alfieri O, Andreotti F, et al. 2012. Guidelines on the management of valvular heart disease (version 2012). *Eur Heart J.* **33**:2451–96.