

DISEASES OF THE AORTA

Relevant Guidelines

ESC 2024 guidelines on peripheral and aortic diseases

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases. *Eur Heart J.* 2024.

ACC/AHA 2022 guidelines on aortic disease

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease. *J Am Coll Cardiol.* 2022

ESC 2020 guidelines on Adult Congenital Heart Disease

2020 ESC Guidelines for the management of adult congenital heart disease. *Eur Heart J.* 2020.

ESC 2020 Guidelines on sports

Pelliccia A, Sharma S, Gati S, et al. 2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease. *Eur Heart J.* 2020.

ESC 2025 guidelines on pregnancy

ESC Guidelines on the management of cardiovascular diseases and pregnancy. *Eur Heart J.* 2025

AORTIC ANATOMY AND DISEASE

Definitions

Aortic root includes the aortic valve annulus, the aortic valve cusps, and the sinuses of Valsalva.^{1,2}

Ascending aorta includes the tubular portion of the ascending aorta beginning at the sinotubular junction and extending to the brachiocephalic artery origin.

Aortic arch from the origin of the brachiocephalic artery to the isthmus between the origin of the left subclavian artery and the ligamentum arteriosum, coursing in front of the trachea and to the left of the esophagus and the trachea.

Descending aorta from the isthmus and through the diaphragm to the abdomen. The segments of the ascending and descending aorta are indicated in Figures 1 and 2.

Average **aortic diameters** in the adult (although the aorta is not a perfect cylinder) are indicated in Figure 2. The aortic diameter thresholds for defining dilation depend on the patient's height and body surface area (BSA). Several methods to normalize aortic diameter are currently used. The most popular ones are the z-score, the Aortic Size Index and Aortic Height Index, and the Cross-sectional Area to Height Ratio.¹

Please insert Figures 1 and 2

Imaging Techniques

Recommendations for aortic imaging techniques and measurements of the aorta are presented in Tables 1-3, and Figure 3. MRI and CT measure the external aortic diameter which is expected to be 0.2-0.4 cm larger than the internal one as measured at echocardiography.

Management

Recommendations for multidisciplinary aortic teams, shared decision making, and physical activity are presented in Tables 4-6.

Pregnancy

Pregnancy

Aortopathy in pregnant women carries substantial risk.^{3,4} Pregnancy causes a slight increase in aortic root diameter, and should be discouraged in women with previous aortic dissection. Pregnancy may be allowed under beta blockade with the known small risk of small for dates

babies, hyperbilirubinemia and hyperglycemia. Dissection and rupture is more common in the third trimester up to 2 days after uneventful delivery and usually occurs in patients with aortic root diameters > 4.5 cm.^{5,6} Recommendations are provided in Tables 7 and 8.

References

1. Writing Committee M, et al. 2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. *Journal of the American College of Cardiology*. 2022. doi: 10.1016/j.jacc.2022.08.004
2. Mazzolai L, et al. 2024 ESC Guidelines for the management of peripheral arterial and aortic diseases. *Eur Heart J*. 2024. doi: 10.1093/eurheartj/ehae179
3. Mehta LS, et al. Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement From the American Heart Association. *Circulation*. 2020;141:e884-e903. doi: 10.1161/CIR.0000000000000772
4. De Backer J, et al. 2025 ESC Guidelines for the management of cardiovascular disease and pregnancy. *Eur Heart J*. 2025. doi: 10.1093/eurheartj/ehaf193
5. Donnelly RT, et al. The immediate and long-term impact of pregnancy on aortic growth rate and mortality in women with Marfan syndrome. *Journal of the American College of Cardiology*. 2012;60:224-229. doi: 10.1016/j.jacc.2012.03.051
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6. Narula N, et al. Pregnancy-Related Aortic Complications in Women With Marfan Syndrome. *JACC*. 2021.