

Thoracic aortic disease is typically asymptomatic until a life-threatening event occurs. Arm yourself and your patient with the knowledge to prevent aortic dissection.

Clinical diagnosis is not always straightforward. Genetic diagnosis clarifies when an aorta warrants surgical repair.

Genetic variants	Associated disease	Surgical repair generally recommended ¹
<i>FBN1</i>	Marfan syndrome	When external diameter reaches 5.0 cm
<i>TGFBR1, TGFBR2, TGFB2, SMAD3</i>	Loeys-Dietz syndrome	External diameter less than 5.0 cm
<i>COL3A1</i>	Vascular Ehlers-Danlos syndrome	Role of non-life-threatening aortic repair is unclear due to tissue fragility, tendency to hemorrhage, and poor healing
<i>ACTA2, MYH11</i> , among others	Heritable thoracic aortic disease	Aortic dilation, which may or may not progress to dissection
Multiple genes	Other syndromes	Aortic dilation, which may or may not progress to dissection

Bicuspid aortic valve (BAV) often occurs together with thoracic aortic aneurysm/dissection (TAAD).²

Familial cascade genetic testing is also recommended once the causative variant is identified in the affected patient.¹

CONSIDER GENETIC TESTING FOR PATIENTS WITH:

- TAAD or BAV

and

- Family history of either TAAD or BAV (present in 20% of individuals with TAAD³)

or

- Features of Marfan, Loews-Dietz, or vascular Ehlers-Danlos syndrome
 - Features of Marfan syndrome:⁴
Ectopia lentis, long limbs, long fingers, pectus deformity, hindfoot deformity, pneumothorax, scoliosis, reduced elbow extension, skin striae, myopia
 - Features of Loews-Dietz syndrome:⁵
Pectus deformity, scoliosis, joint laxity, long fingers, widely spaced eyes, bifid uvula/cleft palate, craniosynostosis, translucent skin, easy bruising, dystrophic scars
 - Features of vascular Ehlers-Danlos syndrome:⁶
Intestinal rupture, uterine rupture during pregnancy, thin translucent skin, easy bruising, thin lips, small jaw, narrow nose, prominent eyes

Questions about which patients to test? Talk to an Invitae genetic counselor by calling 800-436-3037.

Learn more about Invitae's high-quality, affordable genetic testing at www.invitae.com/cardiology.

References:

1. Hiratzka LF *et al.* *Circulation*. 2010;121:e266-369.
2. Prakash SK *et al.* *J Am Coll Cardiol*. 2014;64(8):832-9.
3. Biddinger A *et al.* *J Vasc Surg*. 1997;25(3):506-11.
4. Loews BL *et al.* *J Med Genet*. 2010;47:476-85.
5. Loews BL *et al.* *Nat Genet*. 2005;37:275-81.
6. Beighton P *et al.* *Am J Med Genet*. 1998;77:31-7.

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