



CLINICAL PRACTICE GUIDELINE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease

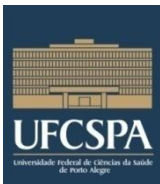
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Declaração de Potencial Conflito de Interesse

Nome do Palestrante: Renato A. K. Kalil

Título da Apresentação:

DIRETRIZES

ACC AHA DOENÇAS DA AORTA 2022

**Não possuo nenhum conflito de interesse
relacionado a esta apresentação**

AVANÇOS RECENTES NO CONHECIMENTO E MANEJO DAS DOENÇAS DA AORTA

O QUE MUDOU?

EXPERIÊNCIA CLÍNICA

INTENSIVISMO

TÉCNICAS E TÁTICAS CIRÚRGICAS

DIAGNÓSTICO POR IMAGEM

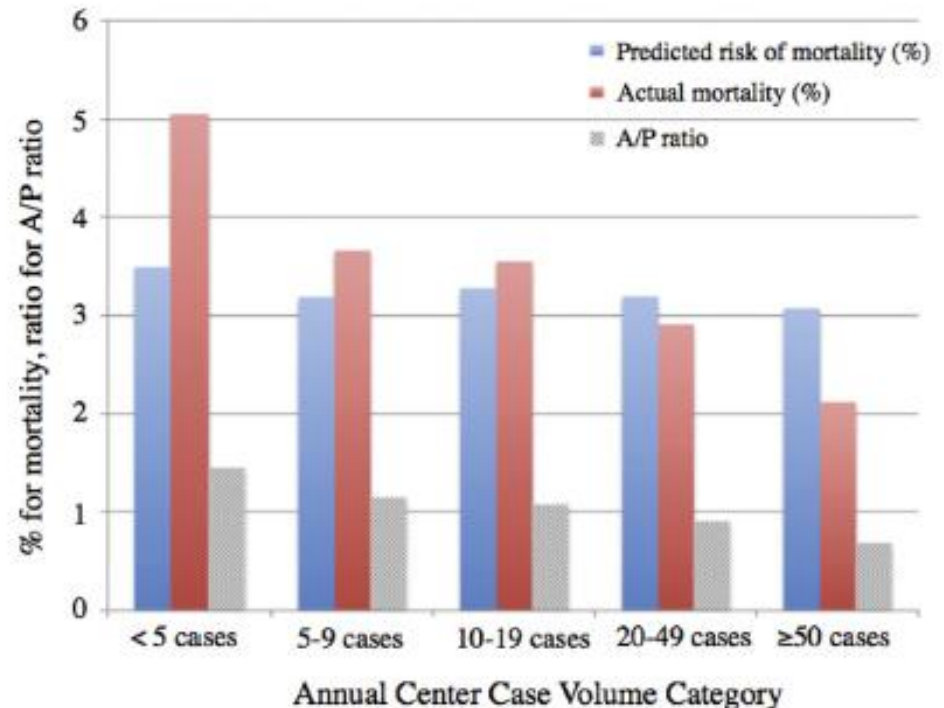
MEDICINA DE PRECISÃO/PAINEL GENÉTICO

TAKE-HOME MESSAGE #1

1. Momento Adequado da Intervenção:

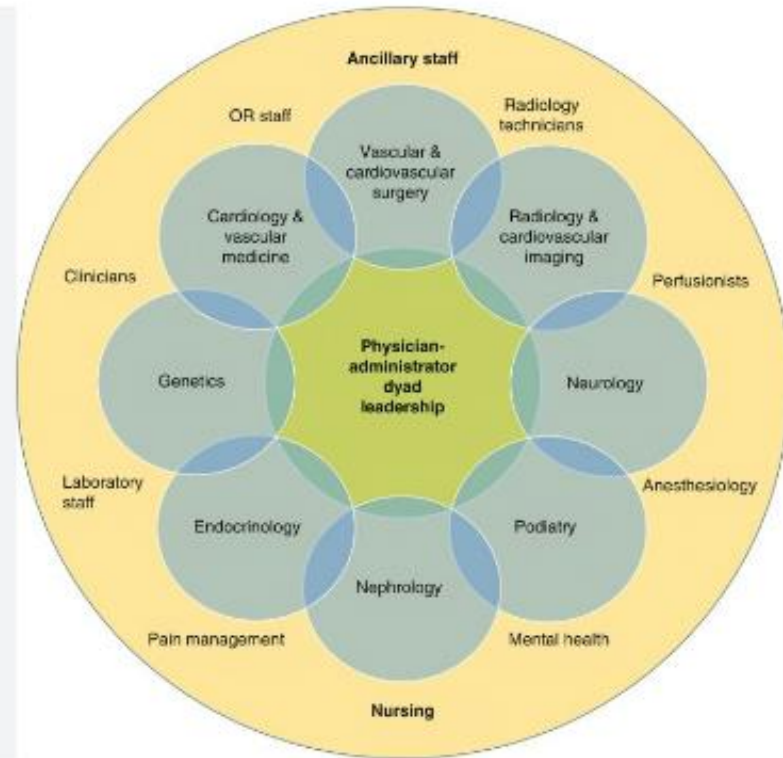
Determinado por equipe multiprofissional - *Multidisciplinary Aortic Team* – pois os resultados são melhores em centros de maior volume com equipes experientes e recursos de manejo extensos disponíveis no momento do procedimento.

FIGURE 15 Predicted Risk of Mortality Derived From the Logistic Regression Model Without Center Case Volume as a Covariate



TAKE-HOME MESSAGE #2

2. **Shared decision-making** involving the patient and a multidisciplinary team is highly encouraged to determine the optimal *medical, endovascular and open surgical therapies*.



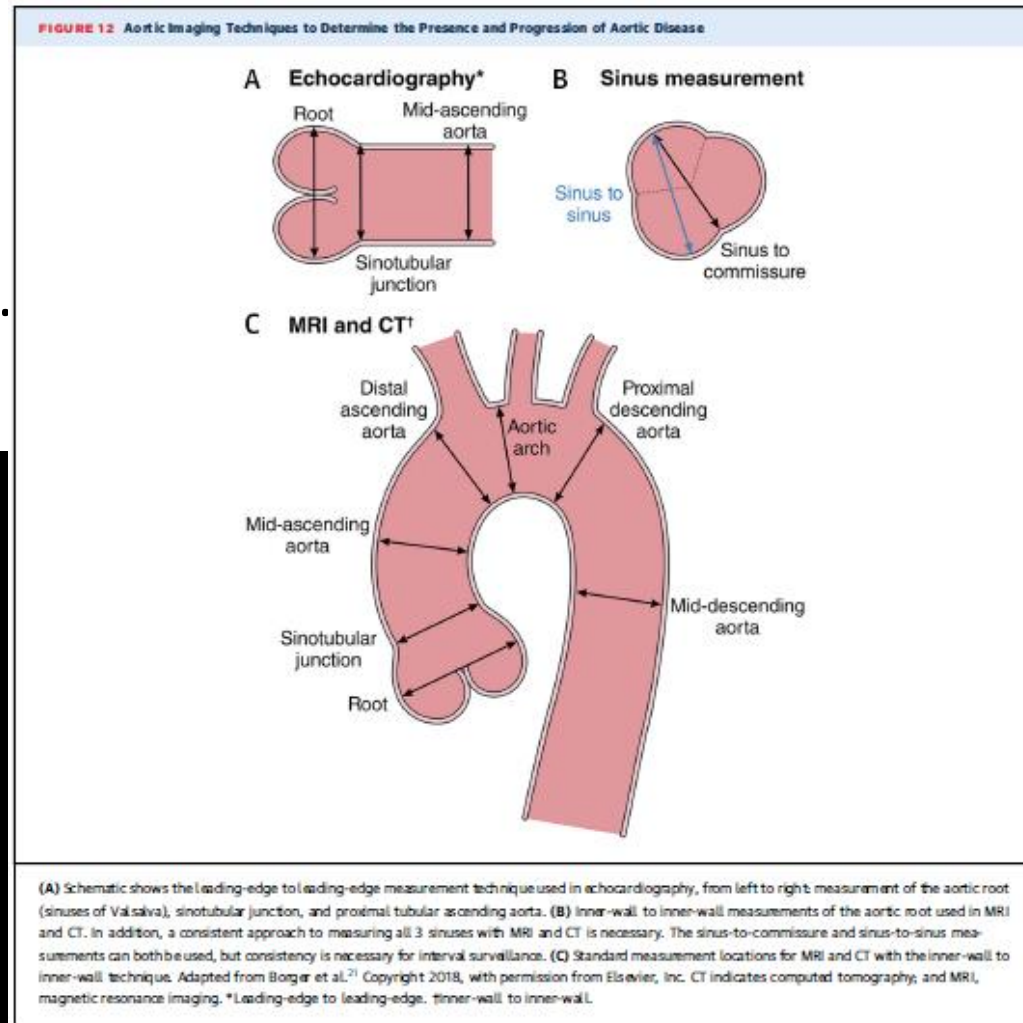
In patients who are contemplating *pregnancy or who are pregnant*, shared decision-making is especially important when considering the cardiovascular risks of pregnancy, the diameter thresholds for prophylactic aortic surgery, and the mode of delivery.

Melissa Russo, Baylor, Texas

TAKE-HOME MESSAGE #3

3. Imaging:

CT, MRI and ECHO imaging of patients with aortic disease should follow recommended approaches for image acquisition, measurement and reporting of relevant aortic dimensions, and frequency of surveillance before and after intervention.



TAKE-HOME MESSAGE #4

4. At centers with Multidisciplinary Aortic Teams and experienced surgeons, the **threshold for surgical intervention** for sporadic aortic root and ascending aortic aneurysms has been **lowered** from 5.5 to 5.0 cm in selected patients, and **even lower** in specific scenarios among patients with heritable thoracic aortic aneurysms.

Key Question

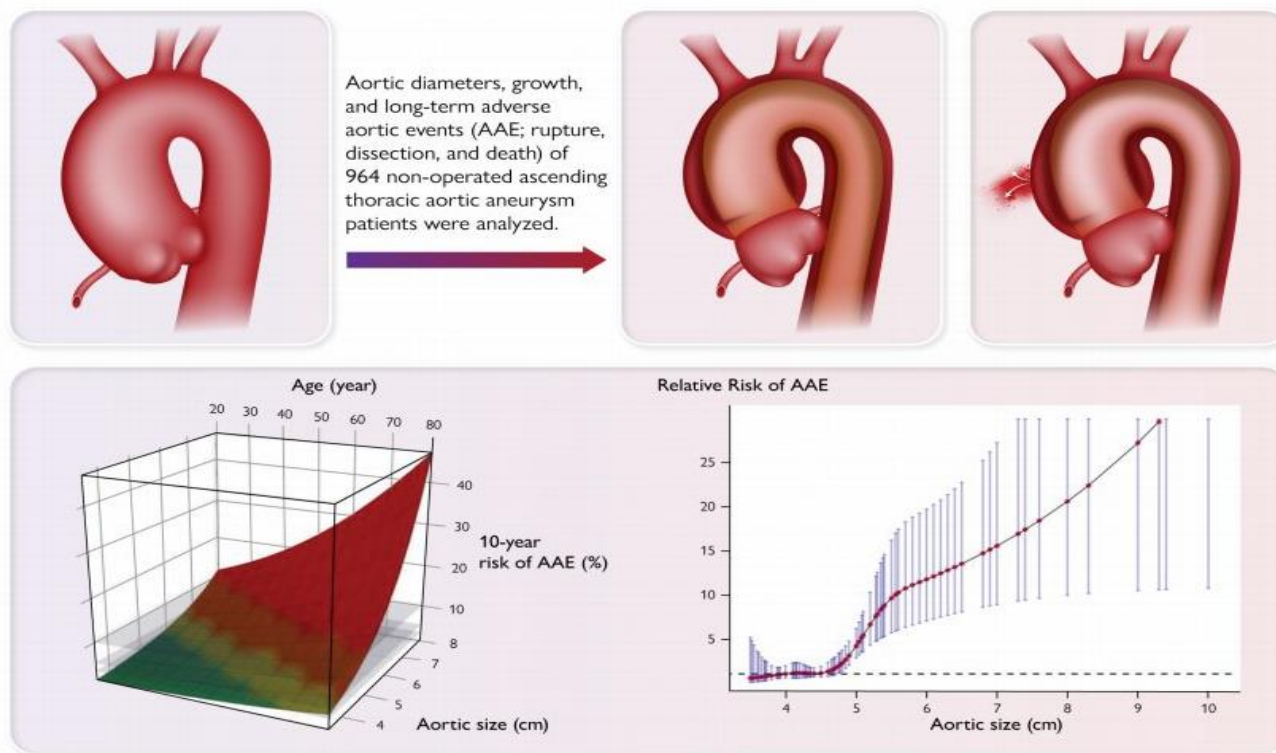
What is the natural history of ascending thoracic aortic aneurysm (ATAA), in the absence of pre-emptive surgical intervention?

Key Finding

- ATAAAs enlarged slowly, with growth rates rarely over 0.2 cm/year.
- The risk of adverse aortic events in the ascending thoracic aorta rose sharply at a hinge point of 5 cm.

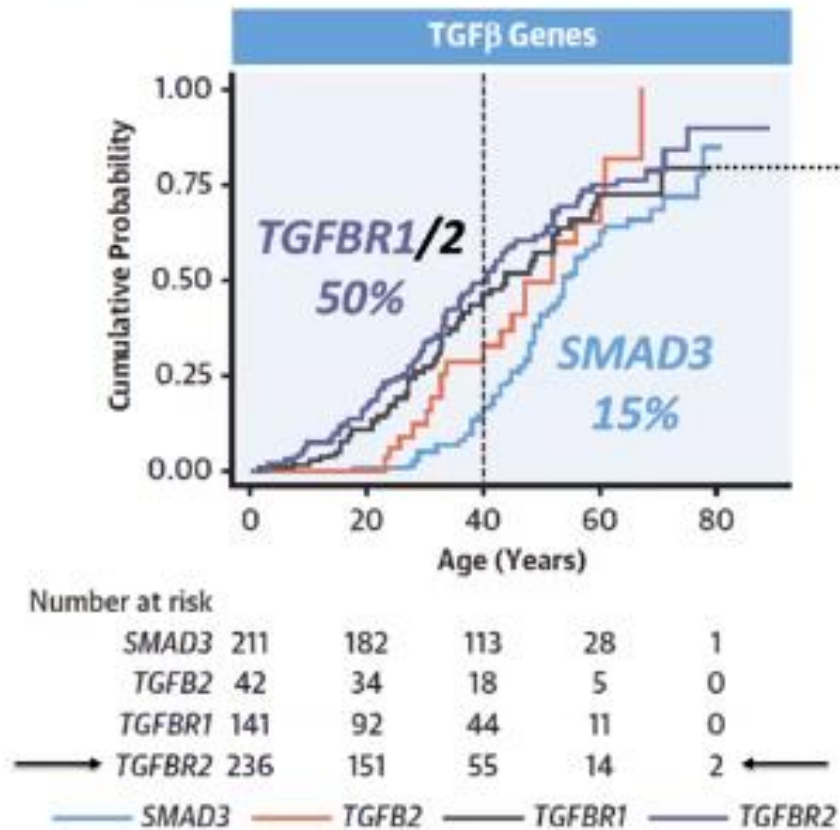
Take Home Message

- In ATAA patients, prophylactic surgical intervention should be considered at 5 cm.
- Bona fide rapid aortic growth is a valid but unusual criterion for intervention.

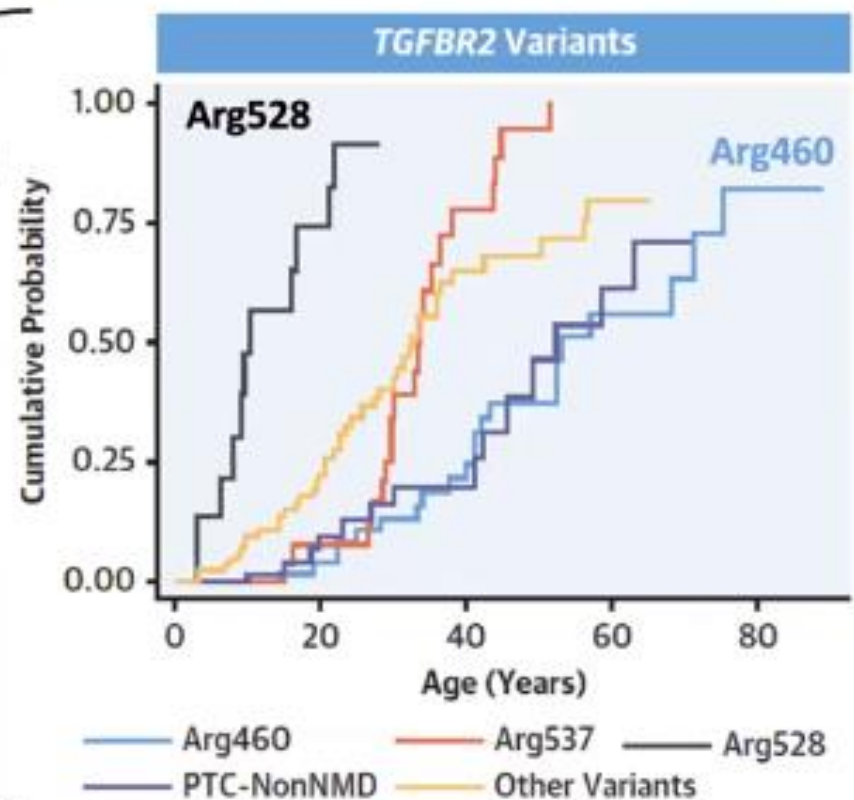


To assess the natural history of ascending aortic aneurysm, we examined the three-decade clinical outcomes of 964 non-operated patients with ascending aortic aneurysm. Note, in the 2D plot, the sharp rise in risk of adverse aortic events is at an aortic size of 5 cm. The 3D plot of risk vs. both size and age also discloses a substantial contribution of advancing age to increased risk. ATAA, ascending thoracic aortic aneurysm; AAE, adverse aortic events.

Gene-Level Differences in Disease Severity



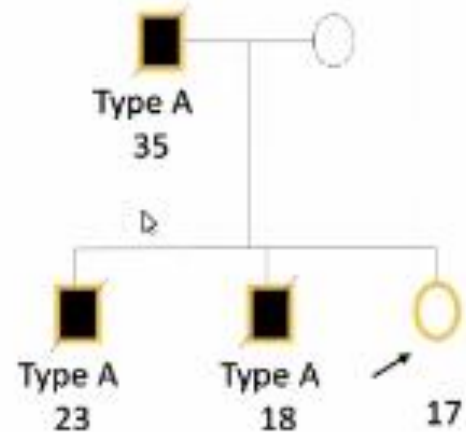
Variant-Level Differences in Disease Severity



Regalado et al. *J Am Coll Card* 2022 (MAC)

Prophylactic Root Replacement in Patients With High-Risk Clinical Features and Virulent Gene Variants

- 17-year-old woman with *PRKG1* variant and normal root diameter
- Father and two brothers died of acute type A dissections (ages 18-35 years)
- Underwent successful elective valve-sparing root replacement
 - Thin aortic wall
 - Smaller sutures (5-0)



Courtesy of Dr. Dianna Milewicz (UT Houston)
Photo used with patient permission

<https://www.aats.org/resources/gene-guided-management-of-aortic-disease>

TAKE-HOME MESSAGE #5

5. Body X Aortic Size

In patients who are significantly smaller or taller than average, surgical thresholds may incorporate **indexing** of the aortic root or ascending aortic diameter to either patient body surface area or height, or aortic cross-sectional area to patient height.

		Aortic Size (cm)									
		3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
Height (inches)	(m)										
		55	1.40	2.50	2.86	3.21	3.57	3.93	4.29	4.64	5.00
57	1.45	2.41	2.76	3.10	3.45	3.79	4.14	4.48	4.83	5.17	5.52
59	1.50	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33
61	1.55	2.26	2.58	2.90	3.23	3.55	3.87	4.19	4.52	4.84	5.16
63	1.60	2.19	2.50	2.81	3.13	3.44	3.75	4.06	4.38	4.69	5.00
65	1.65	2.12	2.42	2.73	3.03	3.33	3.64	3.94	4.24	4.55	4.85
67	1.70	2.06	2.35	2.65	2.94	3.24	3.53	3.82	4.12	4.41	4.71
69	1.75	2.00	2.29	2.57	2.86	3.14	3.43	3.71	4.00	4.29	4.57
71	1.80	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17	4.44
73	1.85	1.89	2.16	2.43	2.70	2.97	3.24	3.51	3.78	4.05	4.32
75	1.90	1.84	2.11	2.37	2.63	2.89	3.16	3.42	3.68	3.95	4.21
77	1.95	1.79	2.05	2.31	2.56	2.82	3.08	3.33	3.59	3.85	4.10
79	2.00	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
81	2.05	1.71	1.95	2.20	2.44	2.68	2.93	3.17	3.41	3.66	3.90

 = low risk (~ 4% per year)
 = moderate risk (~ 7% per year)
 = High risk (~ 12% per year)
 = severe risk (~ 18% per year)

Light green area indicates low risk, yellow area indicates moderate risk, orange area indicates high risk, and red area indicates severe risk.

FIGURE 10. Risk of complications (aortic dissection, rupture, and death) in patients with ascending aortic aneurysm as a function of aortic diameter (horizontal axis) and height (vertical axis), with the aortic height index given within the figure. Light green indicates low risk; yellow, moderate risk; orange, high risk; red, severe risk.

TAKE-HOME MESSAGE #6

6. Growth:

Rapid aortic root or ascending aortic aneurysm growth, an indication for intervention, is defined as

>0.5 cm in 1 year or

>0.3 cm/y in 2 consecutive years

for those with sporadic aneurysms and



> 0.3 cm in 1 year for those with

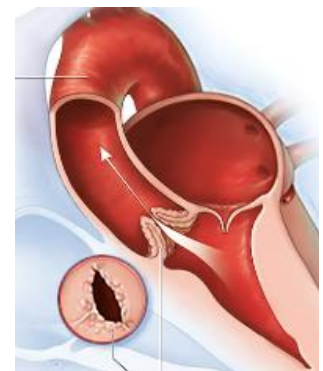
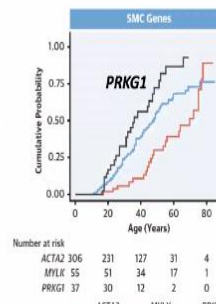
heritable thoracic

aortic disease or

bicuspid aortic valve.

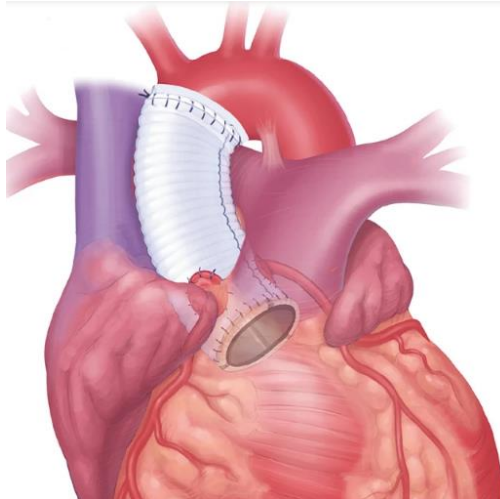


Prophylactic root replacement in patients with high-clinical features and virulent gene variants

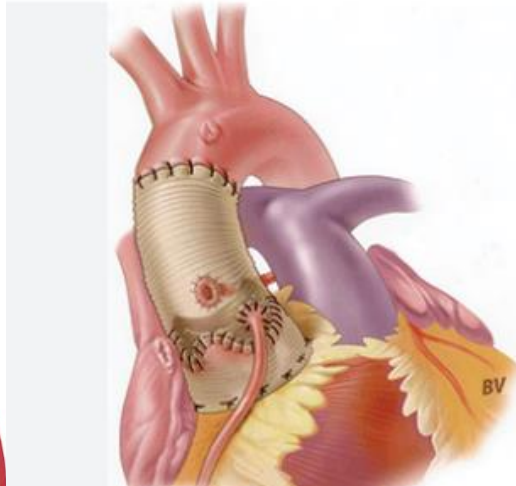


TAKE-HOME MESSAGE #7

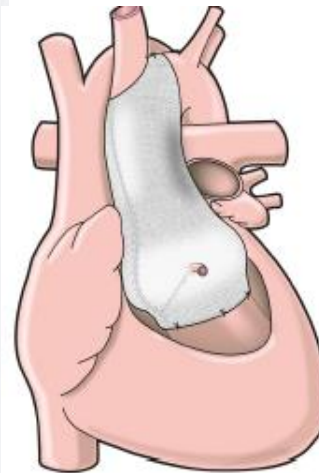
7. In patients undergoing aortic root replacement surgery, **valve-sparing** aortic root replacement is reasonable if the valve is suitable for repair and when performed by experienced surgeons in a Multidisciplinary Aortic Team.



BENTALL-DeBONO



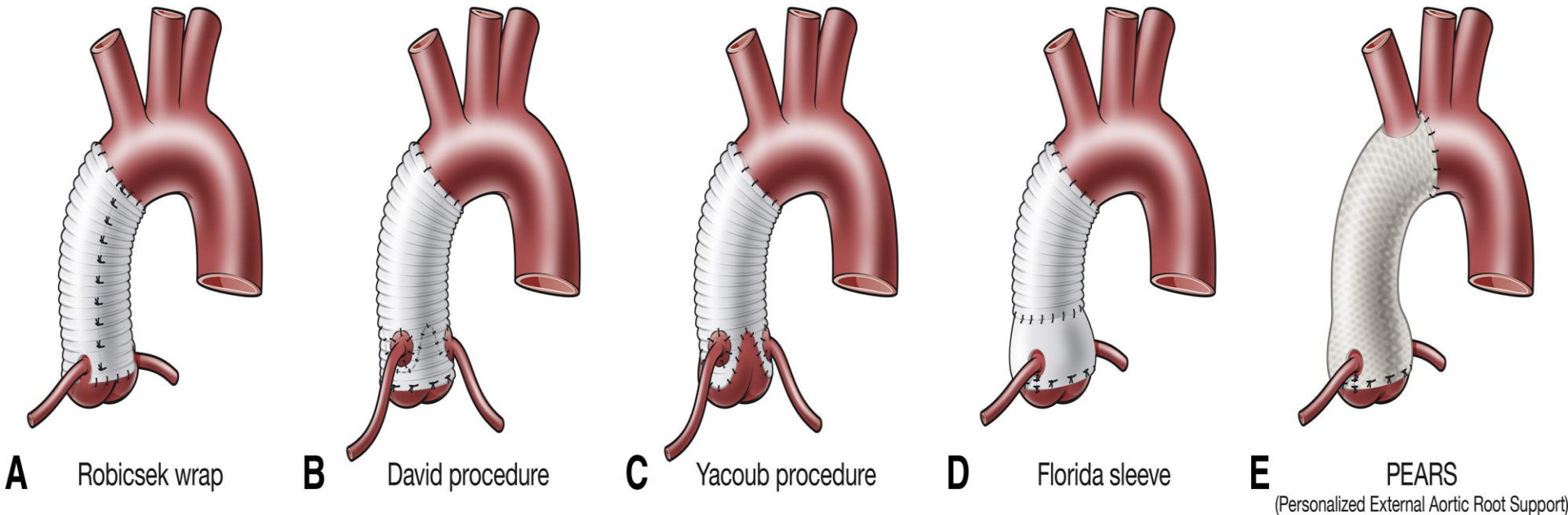
DAVID e YACOUB



PEARS



Valve-sparing aortic root surgery



Buratto & Konstantinov

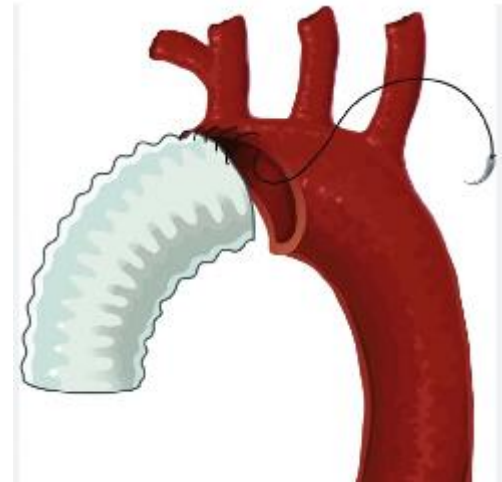
JTCVS [Congenital: Aorta: Invited Expert Technical Review] [Volume 162](#),
[ISSUE 3](#), P955-962, September 01, 2021

TAKE-HOME MESSAGE #8

8. Patients with acute type A aortic dissection, **if clinically stable**, should be considered for transfer to a high-volume aortic center to improve survival.



The operative repair of type A aortic dissection should entail at least an **open distal anastomosis** (under hypothermic circulatory arrest) rather than just a simple supracoronary interposition graft.



Recommendations for Acute Medical Management of AAS

Referenced studies that support the recommendations are summarized in the [Online Data Supplement](#).

COR	LOE	RECOMMENDATIONS
1	B-NR	1. In patients presenting to the hospital with AAS, prompt treatment with anti-impulse therapy with invasive monitoring of BP with an arterial line in an ICU setting is recommended as initial treatment to decrease aortic wall stress. ¹⁻⁵
1	C-LD	2. Patients with AAS should be treated to an SBP <120 mm Hg or to lowest BP that maintains adequate end-organ perfusion , as well as to a target heart rate of 60 to 80 bpm. ^{3,6}
1	B-NR	3. In patients with AAS, initial management should include intravenous beta blockers , except in patients with contraindications. ^{2,5,7}
2a	B-NR	In those with contraindications or intolerance to beta blockers, initial management with an intravenous non-dihydropyridine calcium channel blocker is reasonable for heart rate control. ^{1,2,5}
1	C-LD	4. In patients with AAS, initial management should include intravenous vasodilators if the BP is not well controlled after initiation of intravenous beta-blocker therapy. ⁸
1	C-EO	5. Patients with AAS should be treated with pain control , as needed, to help with hemodynamic management.

TAKE-HOME MESSAGE #9

9. There is an **increasing role for thoracic endovascular** aortic repair in the management of uncomplicated **type B** aortic dissection. Clinical trials of repair of **thoracoabdominal** aortic aneurysms with endografts are reporting results that suggest endovascular repair is an option for patients with suitable anatomy.

Recommendations for Ruptured Descending TAA

Referenced studies that support the recommendations are summarized in the [Online Data Supplement](#).

COR	LOE	RECOMMENDATIONS
1	B-NR	1. In patients with ruptured descending TAA who are anatomic candidates for endovascular repair, TEVAR is recommended over open repair because of decreased perioperative death and morbidity. ¹⁻⁵
2b	B-NR	2. In patients with ruptured descending TAA undergoing TEVAR, intentional coverage of the left subclavian artery, celiac artery, or both may be considered to increase the landing zone for endovascular repair. ⁵⁻⁷

TAKE-HOME MESSAGE #10

10. In patients with aneurysms of the aortic root or ascending aorta, or those with aortic dissection, **screening** of first-degree relatives with aortic imaging is recommended.

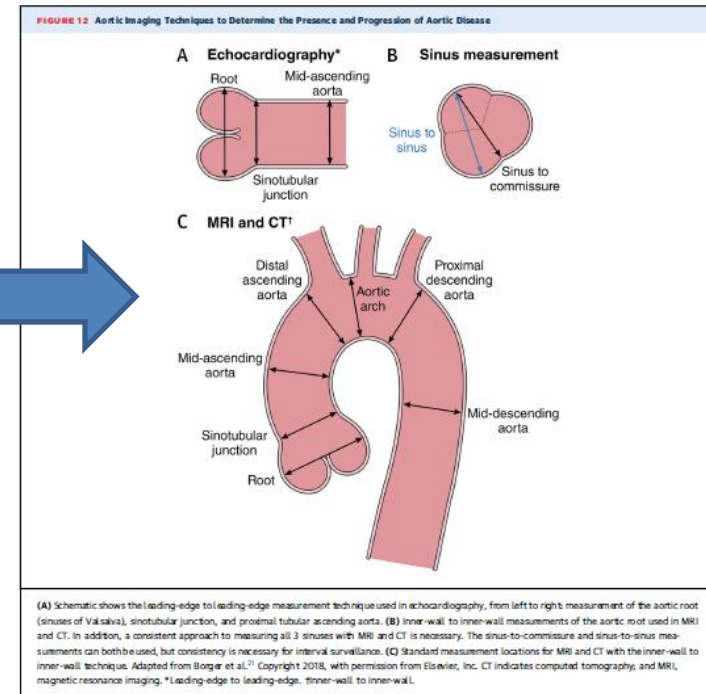
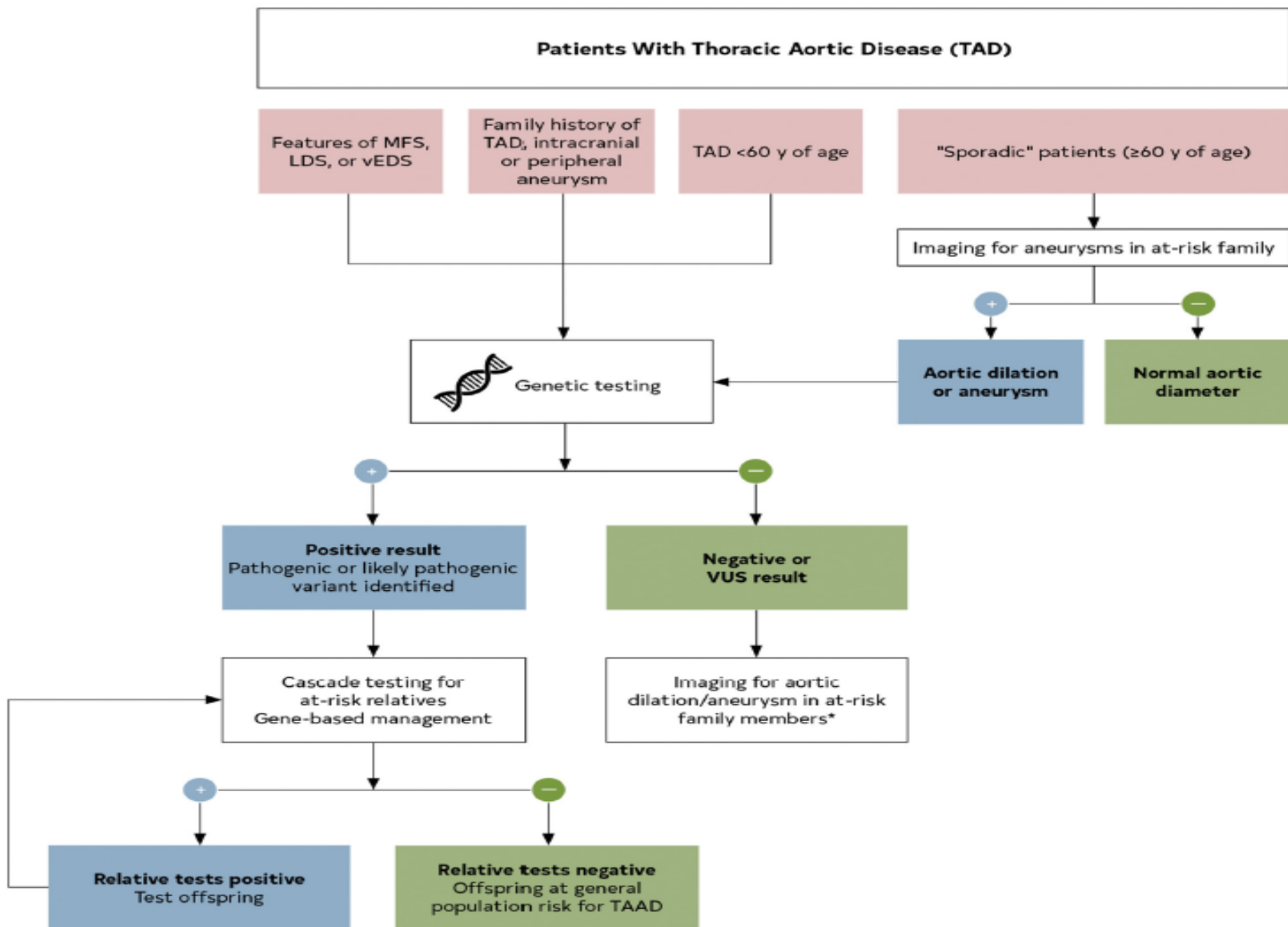


FIGURE 17 Evaluation and Genetic Testing Protocol for Patients With TAD



Surgical intervention thresholds for aortic root & ascending aorta in patients with...

Sporadic and BAV aneurysms*:

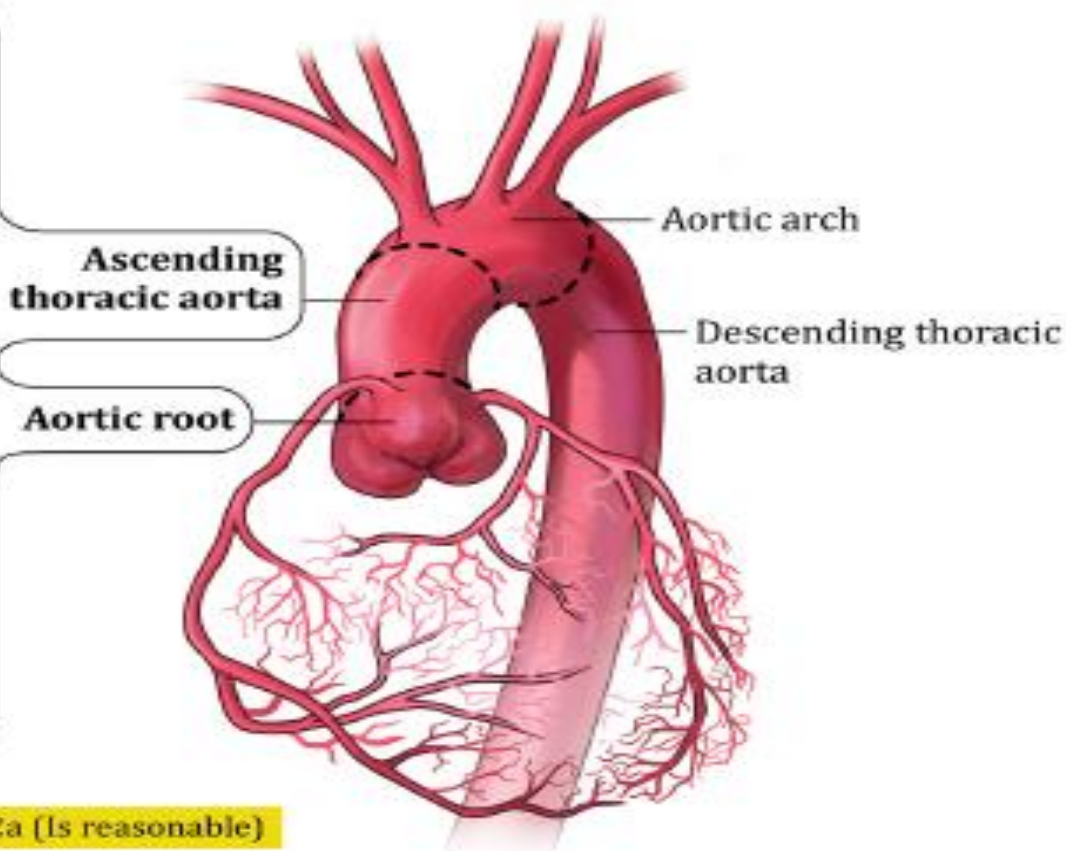
5.5 cm (COR 1)

5.0 cm by experienced surgeons in a Multidisciplinary Aortic Team (COR 2a)

Marfan syndrome#:

5.0 cm (COR 1)

≥4.5 cm in those with an increased risk of aortic dissection when performed by experienced surgeons in a Multidisciplinary Aortic Team (COR 2a)



COR 1 [Is recommended] COR 2a [Is reasonable]

*Surgical thresholds may be adjusted based on patient genetics, rapid aortic growth rate, cross-sectional aortic area/height ratio $\geq 10 \text{ cm}^2/\text{m}$, aortic size index of $\geq 3.08 \text{ cm}/\text{m}^2$, or aortic height index of $\geq 3.21 \text{ cm}/\text{m}$.

#For more on rapid aortic growth rate and patients with nonsyndromic heritable thoracic aortic aneurysms or with genetic aortopathies other than Marfan syndrome (e.g., Loeys-Dietz syndrome), please see the 2022 ACC/AHA Guideline for the Diagnosis & Management of Aortic Disease.

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease

Em Síntese:

Definir momento e local apropriado, em eletivos e agudos

Decisões compartilhadas

Gravidez

Imagens adequadas e segundo critérios padronizados

Limiares de intervenção mais baixos

Avaliar dimensões aórticas X altura do paciente

Avaliar progressão da dilatação

Preferir técnicas de preservação da valva aórtica qd possível

Considerar endovascular na aorta descendente

Screening familiar por imagem e painel genético



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