

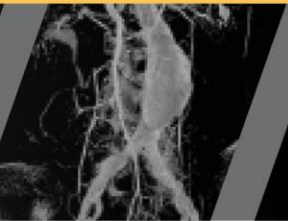
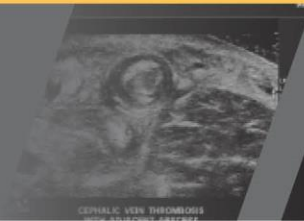
2024 MID-ATLANTIC CONFERENCE
12th ANNUAL CURRENT CONCEPTS IN
VASCULAR THERAPIES

2024



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Aortic Aneurysms
and Dissections:

What Are the Guidelines for Referral,
Monitoring, and Intervention?

Matthew J. Rossi, MD



Guideline Issuing Organizations

- Society of Vascular Surgery (SVS) – 2018, 2021
- American College of Cardiology (ACC) – 2022
- European Society of Vascular Surgery (ESVS) – 2024
- Society of Thoracic Surgery (STS) – 2022
- Canadian Cardiovascular Society (CCS)
- European Society of Cardiology (ESC)
- European Association for Cardio-Thoracic Surgery (EACTS)
- National Institute for Health and Care Excellence (NICE)
- Japanese Circulation Society (JCS)
- Cardiovascular and Interventional Radiological Society of Europe (CIRSE)
- Society of Interventional Radiology (SIR)

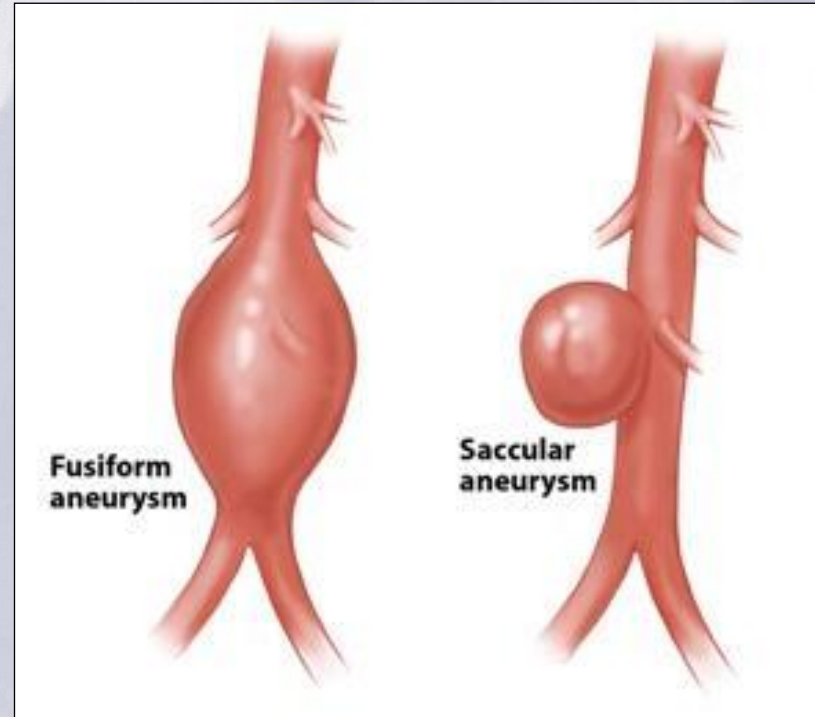
Guideline Structure

CLASS (STRENGTH) OF RECOMMENDATION	LEVEL (QUALITY) OF EVIDENCE‡
<p>CLASS I (STRONG) Benefit >>> Risk</p> <p>Suggested phrases for writing recommendations:</p> <ul style="list-style-type: none"> ■ Is recommended ■ Is indicated/useful/effective/beneficial ■ Should be performed/administered/other ■ Comparative-Effectiveness Phrases†: <ul style="list-style-type: none"> ○ Treatment/strategy A is recommended/indicated in preference to treatment B ○ Treatment A should be chosen over treatment B 	<p>LEVEL A</p> <ul style="list-style-type: none"> ■ High-quality evidence‡ from more than 1 RCT ■ Meta-analyses of high-quality RCTs ■ One or more RCTs corroborated by high-quality registry studies
<p>CLASS III: No Benefit (MODERATE) Benefit = Risk</p> <p><i>(Generally, LOE A or B use only)</i></p>	<p>LEVEL C-LD (Limited Data)</p> <ul style="list-style-type: none"> ■ Randomized or nonrandomized observational or registry studies with limitations of design or execution ■ Meta-analyses of such studies ■ Physiological or mechanistic studies in human subjects
<p>Suggested phrases for writing recommendations:</p> <ul style="list-style-type: none"> ■ Is not recommended ■ Is not indicated/useful/effective/beneficial ■ Should not be performed/administered/other 	<p>LEVEL C-EO (Expert Opinion)</p> <p>Consensus of expert opinion based on clinical experience</p>

When Does the Patient Have an Aneurysm?

- Aortic Arch >4.0cm
- Descending Thoracic Aortic >4.0cm
- Abdominal Aortic >3.0cm

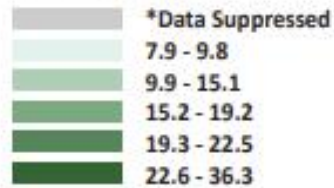
- Pathophysiology
 - Degenerative
 - Sporadic vs. Familial
 - Inflammatory
 - Infectious



Tobacco use and Aortic Aneurysms

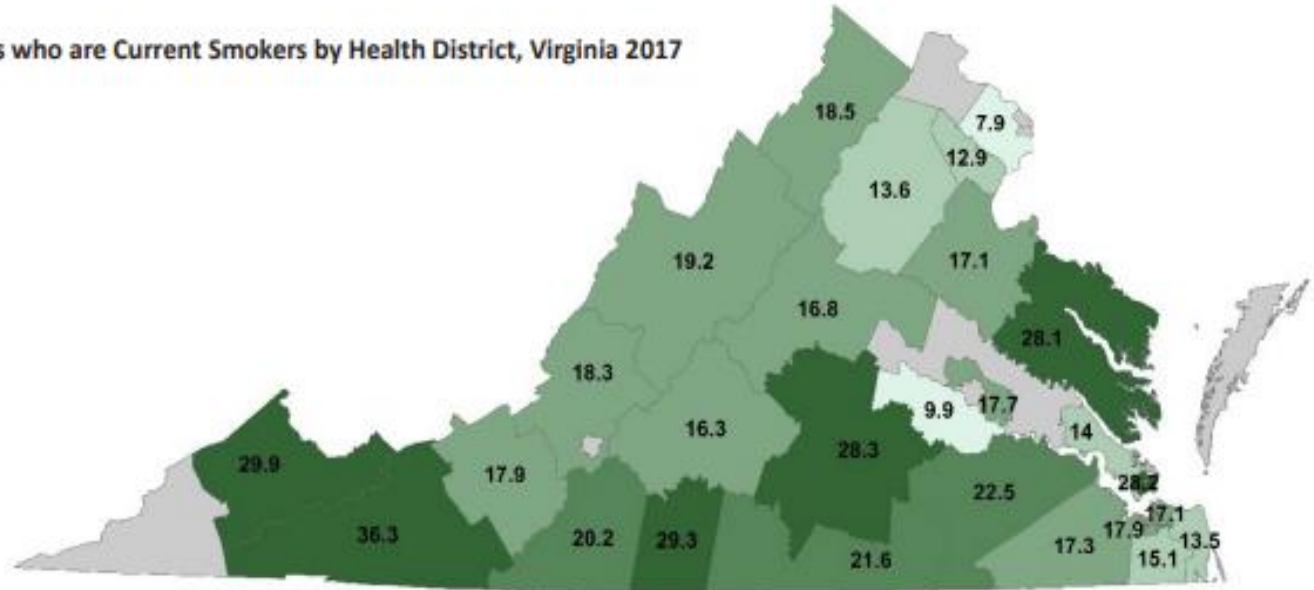
Figure 1. Percentage of Adults who are Current Smokers by Health District, Virginia 2017

Percentage (%)



Source:

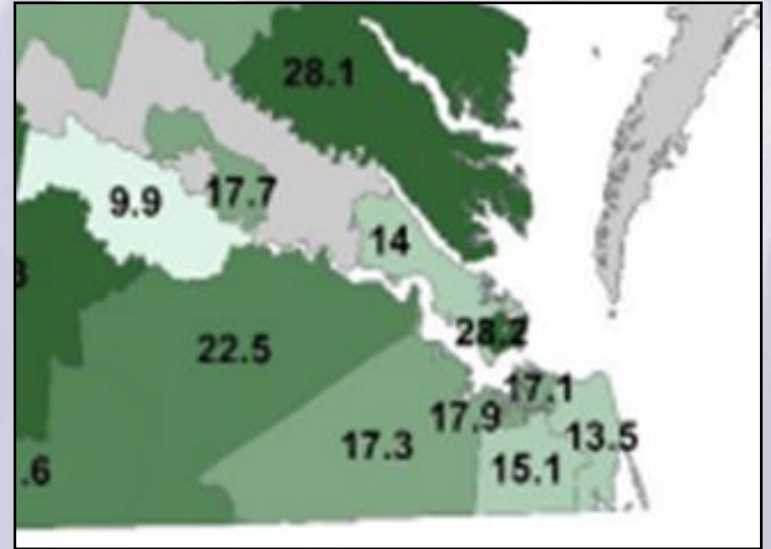
Virginia Department of Health,
Division of Population Health,
Behavioral Risk Factor
Surveillance Survey, 2017



Epidemiology for Aortic Aneurysms

- National Tobacco Use: 11.5%
- AAA Incidence: 0.5%
- Regional Population: 700,000
- 0.5%/year x 700,000 people =

3500 Aneurysms/year



Referral Guidelines for Aortic Aneurysms

- Symptomatic or Ruptured Aneurysms
 - Immediate Evaluation with CT Angiogram

CLASS I (STRONG)

Benefit >>> Risk

Suggested phrases for writing recommendations:

- Is recommended
- Is indicated/useful/effective/beneficial
- Should be performed/administered/other
- Comparative-Effectiveness Phrases†:
 - Treatment/strategy A is recommended/indicated in preference to treatment B
 - Treatment A should be chosen over treatment B

Level of Evidence B Data derived from a single randomised trial, large non-randomised studies, or a meta-analysis of non-randomised studies

Referral Guidelines for Aortic Aneurysms

- All Aortic Aneurysms Should be Referred
 - Below threshold for repair: Within 12 weeks (NICE)
 - At or above threshold for repair: Within 2 weeks (NICE)
 - At or above threshold for repair: Within 8 weeks (ESVS)
 - Unless a patient would not want intervention

LEVEL C-EO

(Expert Opinion)

Consensus of expert opinion based on clinical experience

Referral Guidelines for Aortic Aneurysms

Aneurysm Size	Annual Rupture Risk
<5.5cm (Men) <5.0cm (Women)	0.3-0.8% 0.2-1.4%
5.5-6.0cm	1.0-3.5%
6.1-7.0cm	2.3-4.1%
>7.0cm	6.3-6.4% ... 33%

RESCAN et al, JAMA 2013
Parkinson et al, JVS 2015.
Lancaster et al, JVS 2022
Wanhainen et al. EJVES 2024

Surveillance Guidelines

AAA Size	Next Imaging
3.0-3.9cm	3 years
4.0-4.9cm (men) 4.0-4.4cm (women)	1 year
5.0-5.4cm (men) 4.5-4.9cm (women)	6 months

CLASS IIa (MODERATE)

Benefit >> Risk

Suggested phrases for writing recommendations:

- Is reasonable
- Can be useful/effective/beneficial
- Comparative-Effectiveness Phrases†:
 - Treatment/strategy A is probably recommended/indicated in preference to treatment B
 - It is reasonable to choose treatment A over treatment B

Level of Evidence B Data derived from a single randomised trial, large non-randomised studies, or a meta-analysis of non-randomised studies

Level of Evidence C Consensus opinion of experts and or small studies, retrospective studies, registries

Medical Management of Aortic Aneurysms

Effects of Exercise Training on Vascular Markers of Disease Progression in Patients with Small Abdominal Aortic Aneurysms

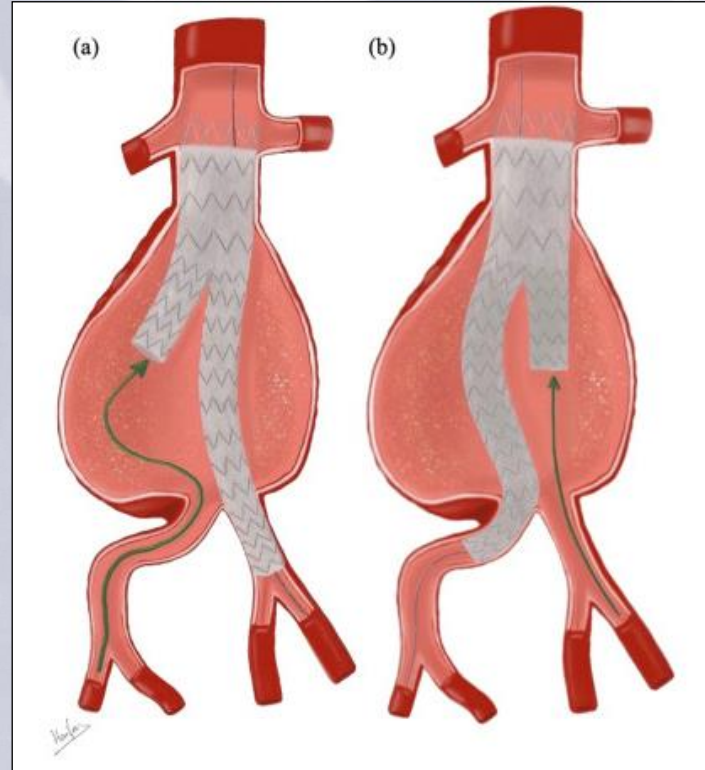
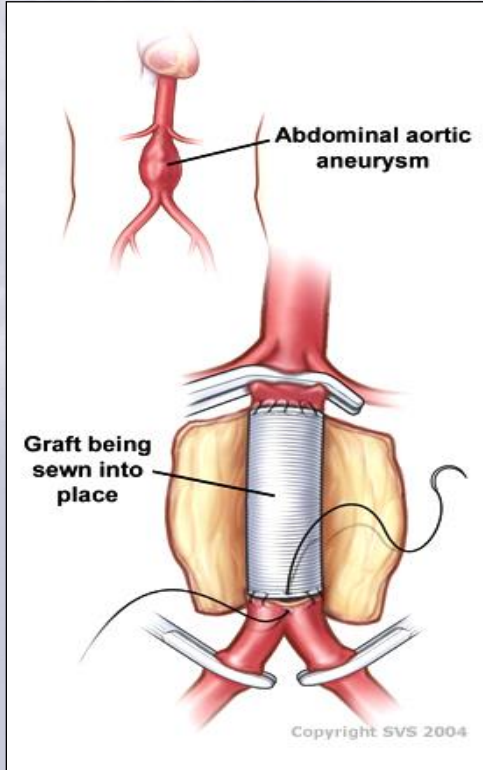
Sarah Niebauer MD^a, Josef Niebauer MD, PhD^b, Ronald Dalman MD^c,

Jonathan Myers PhD^d  

Table 8. Studies on rupture risk of small abdominal aortic aneurysms.

Study	Recruitment	Modality	Measurement	Threshold	Ruptures
ADAM ²⁴²	1992–2000	CTA	The diameter of the aneurysm was defined as the maximum external cross sectional measurement in any plane but perpendicular to any bend in the vessel	55 mm	0.6%/year
UKSAT ^{239,255}	1991–1998	US	Maximum anteroposterior diameter	55 mm	0.6%/year
CEASAR ²⁴⁰	2004–2008	CTA	Diameter of the aneurysm was defined on computed tomography scan at the maximum external cross sectional measurement in any plane but perpendicular to the vessel axis	55 mm	2/178 (1.1%) after 24 and 52 months of follow up
PIVOTAL ²⁴¹	Not specified	CTA	infrarenal AAAs between 4.0 and 50 mm in diameter by computed tomography	55 mm	0.3%/20 months
NAAASP ¹¹⁶	2009–2017	US	Inner to inner maximum anteroposterior diameter	55 mm	0.03% per annum (95% CI 0.02–0.05%) for men with small AAAs 0.28% (0.17–0.44%) for medium AAAs 0.40% (0.22–0.73%) for men with AAAs just below the referral diameter threshold (50–54 mm)
Scott ²⁵⁶	1988–1995	US	The maximum aortic diameters in both the transverse and anteroposterior planes were recorded	60 mm	0.8%/year
RESCAN ¹⁰⁶	IPD meta-analysis	US	Inner to inner and outer to outer diameter	55 mm	0.64%/year at 50 mm (men) 2.97%/year at 50 mm (women)

How to Intervene? Open versus Endo



How to Intervene? Open versus Endo

- Rupture – Endovascular Repair

Class	Level
I	A

- Elective

- SVS, 2018 – No Preference

- ESVS, 2024

- Life expectancy >10 Years – **OPEN**
- Life Expectancy 2-10 Years – **ENDO**
- Life Expectancy <2 Years – **Consider no Intervention**

Class	Level
IIa	B

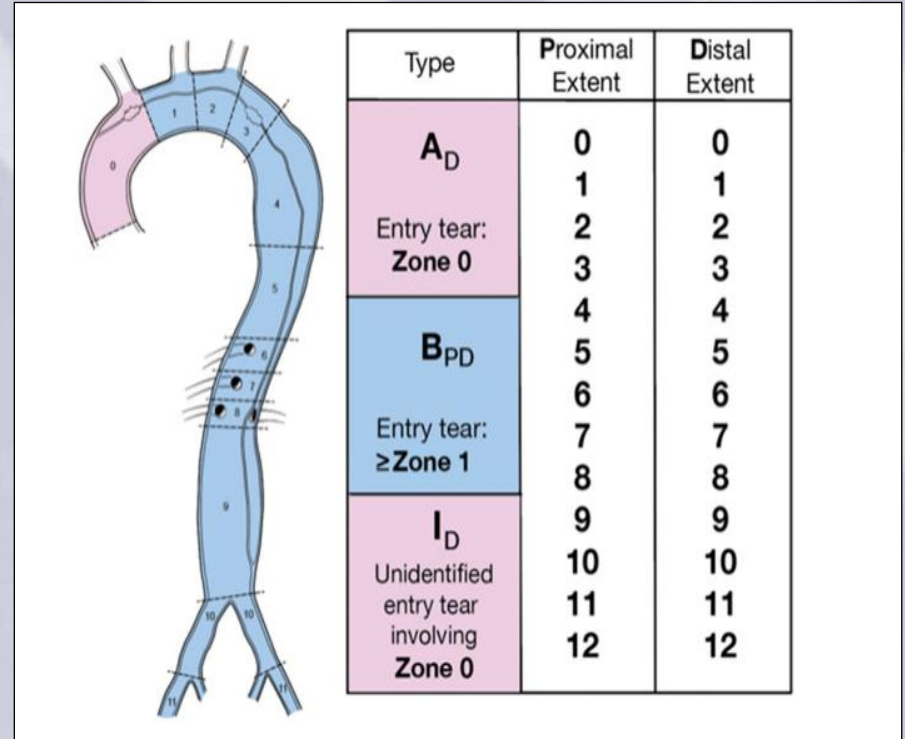
How to follow-up? AAA

Classification	Low Risk	High Risk	Failed EVAR
	Adequate Overlap	Marginal Overlap	Expanding Sac
	No Endoleaks	Type II Endoleak	Type I/III Endoleak
	Within IFU	Outside IFU	Imminent Loss of Seal
Recommendation	Limited CTA at 5 Years	Yearly CTA or Duplex	Reintervention



Type B Aortic Dissections

- Uncomplicated
 - No Malperfusion
 - No High Risk Features
- High Risk
 - Refractory Pain
 - Refractory Hypertension
 - High Risk Radiologic Findings
- Complicated
 - Malperfusion
 - Rupture



Type B Aortic Dissections

TABLE 1 Morphologic Features Posing High Risk of

CLASS IIb (WEAK)

Benefit \geq Risk

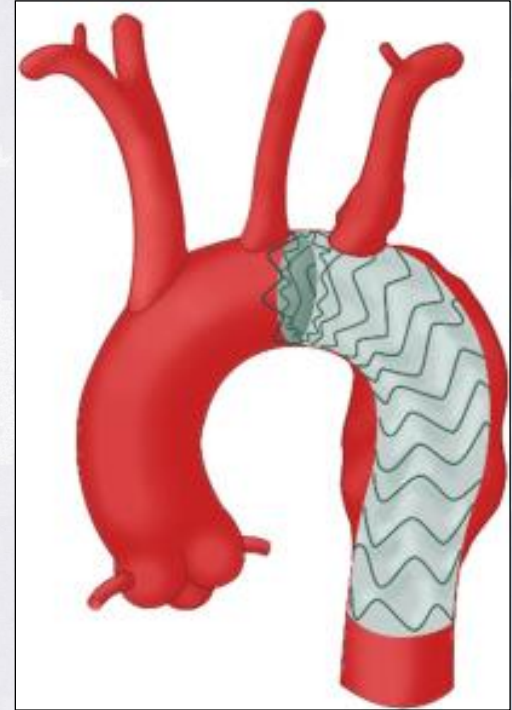
Suggested phrases for writing recommendations:

- May/might be reasonable
- May/might be considered
- Usefulness/effectiveness is unknown/unclear/uncertain or not well established

Partial false lumen thrombosis

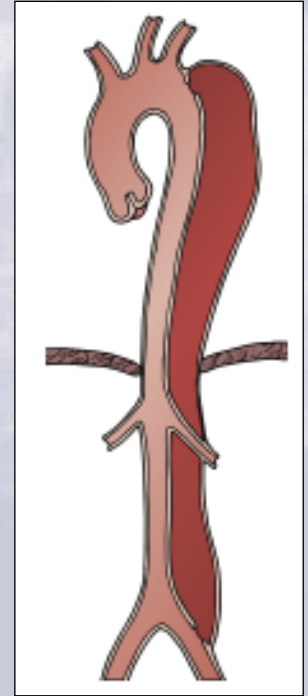
How to Repair? - Type B Dissections

- TEVAR is superior to open surgical repair
- Surgical replacement is first line for patients with connective tissue disorders



Surveillance & Re-Intervention

- Medical Management
 - ACC, 2022 – 30 days, 6mon, Yearly
- Post – Intervention
 - SVS, 2021 – 30 days, Yearly
 - ACC, 2022 – 30 days, 6mon, Yearly
 - STS, 2022 – “Close Clinical Follow-up”



AAA Summary of Recommendations

- Referral
 - Symptomatic/Ruptured Aneurysms – immediately
 - Aneurysms in Need of Repair – within 2 weeks
 - Aneurysms Not in Need of Repair – within 12 weeks
- Monitoring
 - Regular imaging in accordance with aneurysm size
 - Smoking Cessation and Management of Risk Factors

AAA Summary of Recommendations

- Intervention
 - Symptomatic/Ruptured Aneurysms – immediately with EVAR
 - Elective Aneurysm Repair – EVAR unless long life expectancy
- Post-Operative Surveillance
 - 30 Day CT angiogram to establish efficacy and future risk
 - Regular imaging in accordance with late complication risk

TBAD Summary of Recommendations

- Intervention
 - Complicated – TEVAR + Medical Management
 - High Risk Features – TEVAR + Medical Management
 - Uncomplicated – Serial Monitoring + Medical Management
 - Connective Tissue Disorder – Open Repair
- Post-Operative Surveillance
 - 1 month, 6 month, 1 year, then annual imaging

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- Parkinson et al. Rupture rates of untreated large abdominal aortic aneurysms in patients unfit for elective repair. *J Vasc Surg* 61:1606-12. 2015.
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- Isselbacher et al. 2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the AHA/ACC Joint Committee on CPC. *J Am Coll Cardiol*. Nov 2022.
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