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2024 Abdominal Aneurysm Repair Procedures (EVAR/ TEVAR)

Cardiology Services

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Endovascular Abdominal Aortic Aneurysm Repair (EVAR)

EVAR Guideline

An endovascular [1] repair of an abdominal aortic aneurysm (AAA) is considered medically appropriate when the documentation demonstrates **ALL** of the following:

I. Clinical situation includes **ANY** of the following:

A. Abdominal aortic aneurysm and **ANY** of the following:

1. AAA diameter 5.0 cm or larger in a female. [7] [30]
2. AAA, fusiform, 5.5 cm or larger in diameter in a male demonstrated on recent imaging (eg, coronary computed tomography angiography [CCTA], ultrasound). [9] [25] [30]
3. AAA, growth rate of 10 mm (1 cm) or more a year, and 40 mm (4 cm) or larger. [25]
4. AAA, ruptured *__NOTE__: *Requires emergent/immediate repair.* [22]
5. AAA, sacular [30]
6. AAA, symptomatic (eg, abdominal or back pain; acute, deep, aching or throbbing chest or abdominal pain radiating to back, buttocks, flank, groin or legs). [22] [26] [11]
7. Abdominal copathology (eg, horseshoe kidney, hostile abdomen, stoma) [1]

B. Endoleak and **ANY** of the following:

1. Endoleak Type I or endoleak Type III, with conversion to open approach if endovascular options have failed [9]
2. Endoleak Type II, with significant aneurysm expansion [26]
3. Endoleak Type V, endotension and aneurysm sac expansion [21] [30]

II. Perioperative risks are acceptable (eg, cardiovascular disease, diabetes and renal disease should be optimally managed prior to EVAR).[2]

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[1]EVAR is the primary treatment method for the repair of AAA. A conversion to open surgical repair (OSR) may be required acutely due to intraoperative complications (eg, access problems or endograft deployment errors) or as late reintervention (due to graft migration, persistent endoleak, graft thrombosis or infection). [23] [25]

[2]Prior to an elective EVAR in high-risk situations, shared decision making, with information on the Vascular Quality Initiative (VQI) mortality risk score, should be completed. [27] The Society for Vascular Surgery (SVG) suggest elective EVAR

EVAR Contraindications and Exclusions

Contraindications or exclusions for an endovascular repair of an abdominal aortic aneurysm (AAA) may include **ANY** of the following:

- Complex aortic anatomy (eg, those with aneurysms in close proximity to or involving the renal arteries) [10] [26]
- Connective tissue disorder (eg, Ehler-Danlos syndrome Type IV, Marfan syndrome) [10] [26]

EVAR Procedure Codes

Table 1. Endovascular Abdominal Aortic Aneurysm Repair (EVAR) Associated Procedure Codes

CODE	DESCRIPTION
34701	Endovascular repair of infrarenal aorta by deployment of an aorto-aortic tube endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, all endograft extension(s) placed in the aorta from the level of the renal arteries to the aortic bifurcation, and all angioplasty/stenting performed from the level of the renal arteries to the aortic bifurcation; for other than rupture (eg, for aneurysm, pseudoaneurysm, dissection, penetrating ulcer)
34702	Endovascular repair of infrarenal aorta by deployment of an aorto-aortic tube endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, all endograft extension(s) placed in the aorta from the level of the renal arteries to the aortic bifurcation, and all angioplasty/stenting performed from the level of the renal arteries to the aortic bifurcation; for rupture including temporary aortic and/or iliac balloon occlusion, when performed (eg, for aneurysm, pseudoaneurysm, dissection, penetrating ulcer, traumatic disruption)
34703	Endovascular repair of infrarenal aorta and/or iliac artery(ies) by deployment of an aorto-uni-iliac endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, all endograft extension(s) placed in the aorta from the level of the renal arteries to the iliac bifurcation, and all angioplasty/stenting performed from the level of the renal arteries to the iliac bifurcation; for other than rupture (eg, for aneurysm, pseudoaneurysm, dissection, penetrating ulcer)
34704	Endovascular repair of infrarenal aorta and/or iliac artery(ies) by deployment of an aorto-uni-iliac endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, all endograft extension(s) placed in the aorta from the level of the renal arteries to the iliac bifurcation, and all angioplasty/stenting performed from the level of the renal arteries to the iliac bifurcation; for rupture including temporary aortic and/or iliac balloon occlusion, when performed (eg, for aneurysm, pseudoaneurysm, dissection, penetrating ulcer, traumatic disruption)
34705	Endovascular repair of infrarenal aorta and/or iliac artery(ies) by deployment of an aorto-bi-iliac endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, all endograft extension(s) placed in the aorta from the level of the renal arteries to the iliac bifurcation, and all angioplasty/stenting performed from the level of the renal arteries to the iliac bifurcation; for other than rupture (eg, for aneurysm, pseudoaneurysm, dissection, penetrating ulcer)

be performed at centers with a volume of at least 10 EVAR cases each year and a documented perioperative mortality and conversion rate to open surgical repair of 2% or less. [8]

CODE	DESCRIPTION
34706	Endovascular repair of infrarenal aorta and/or iliac artery(ies) by deployment of an aorto-bi-iliac endograft including pre-procedure sizing and device selection, all nonselective catheterization(s), all associated radiological supervision and interpretation, all endograft extension(s) placed in the aorta from the level of the renal arteries to the iliac bifurcation, and all angioplasty/stenting performed from the level of the renal arteries to the iliac bifurcation; for rupture including temporary aortic and/or iliac balloon occlusion, when performed (eg, for aneurysm, pseudoaneurysm, dissection, penetrating ulcer, traumatic disruption)
34830	Open repair of infrarenal aortic aneurysm or dissection, plus repair of associated arterial trauma, following unsuccessful endovascular repair; tube prosthesis
34831	Open repair of infrarenal aortic aneurysm or dissection, plus repair of associated arterial trauma, following unsuccessful endovascular repair; aorto-bi-iliac prosthesis
34832	Open repair of infrarenal aortic aneurysm or dissection, plus repair of associated arterial trauma, following unsuccessful endovascular repair; aorto-bifemoral prosthesis
34841	Endovascular repair of visceral aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) by deployment of a fenestrated visceral aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including one visceral artery endoprosthesis (superior mesenteric, celiac or renal artery)
34842	Endovascular repair of visceral aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) by deployment of a fenestrated visceral aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including two visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])
34843	Endovascular repair of visceral aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) by deployment of a fenestrated visceral aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including three visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])
34844	Endovascular repair of visceral aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) by deployment of a fenestrated visceral aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including four or more visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])
34845	Endovascular repair of visceral aorta and infrarenal abdominal aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) with a fenestrated visceral aortic endograft and concomitant unibody or modular infrarenal aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including one visceral artery endoprosthesis (superior mesenteric, celiac or renal artery)
34846	Endovascular repair of visceral aorta and infrarenal abdominal aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) with a fenestrated visceral aortic endograft and concomitant unibody or modular infrarenal aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including two visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])
34847	Endovascular repair of visceral aorta and infrarenal abdominal aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) with a fenestrated visceral aortic endograft and concomitant unibody or modular infrarenal aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including three visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])

CODE	DESCRIPTION
34848	Endovascular repair of visceral aorta and infrarenal abdominal aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption) with a fenestrated visceral aortic endograft and concomitant unibody or modular infrarenal aortic endograft and all associated radiological supervision and interpretation, including target zone angioplasty, when performed; including four or more visceral artery endoprostheses (superior mesenteric, celiac and/or renal artery[s])

Medicare Inpatient Only Codes

34701, 34702, 34703, 34704, 34705, 34706, 34830, 34831, 34832, 34841, 34842, 34843, 34844, 34845, 34846, 34847, 34848

Thoracic Endovascular Aortic Aneurysm Repair (TEVAR)

TEVAR Repair Guideline

Thoracic endovascular aortic aneurysm repair (TEVAR) is considered medically appropriate when the documentation demonstrates **ALL** of the following:

I. Anatomy is suitable for TEVAR. [3]

II. Descending thoracic aortic aneurysm (DTA) is demonstrated on diagnostic examination and **ANY** of the following:

A. Asymptomatic, low-risk and the maximum diameter exceeds 5.5 cm. [19][4]

B. Complicated, descending aorta, type B dissection (enlarging aneurysm, hematoma, hemothorax, inability to control blood pressure, persistent or recurrent pain, progression of dissection) [9] [16] [10] [19]

C. DTA pseudoaneurysm [14]

D. DTA rupture [5] [15]

E. Intramural hematoma (IMH) or penetrating aortic ulcer (PAU) with persistent symptoms or evidence of disease progression on follow-up imaging, after a period of hypertension control and complicated type B (localized in aortic arch and DTA) IMH or PAU [29]

[3]The Society for Vascular Surgery recommends TEVAR as the preferred approach to treat elective descending thoracic aneurysms (DTA) in patients who could undergo either technique (open or endovascular) given its reduced morbidity, length of stay, and short-term mortality. [29]

[4]**Low Risk** is when the combined surgical and patient characteristics predict a risk of a major adverse cardiac event (MACE) of death or myocardial infarction of less than 1%. [3]

F. Reintervention after a TEVAR requiring endovascular endoleak repair and **ANY** of the following:

1. Endoleak type I (absence or loss of complete sealing at the proximal [type 1a] or distal [type 1b] seal zone) [2] [10]
2. Endoleak type III (component separation or fabric disruption) [2] [10]

G. Symptomatic (abdominal pain, back pain, chest pain) [26] [10]

III. Mycotic/infected aneurysm, symptomatic, as temporizing measure pending definitive treatment [6]

TEVAR Contraindications and Exclusions

Contraindications or exclusions for thoracic endovascular aneurysm repair (TEVAR) include **ANY** of the following:

- Anatomy is unfavorable (eg, extensive circumferential thrombus or atheroma at the desired landing zone, inadequate access) [14]
- Connective tissue disorder present [14]
- Distal seal zones inadequate (distal or proximal) [6]

Open Thoracic Aortic Aneurysm Repair Guideline

Open surgical repair of a thoracic aortic aneurysm (TAA) is considered medically appropriate when the documentation demonstrates **ALL** of the following:

I. Descending thoracic aortic aneurysm (DTA) is demonstrated on diagnostic examination and **ANY** of the following:

A. Aortic arch aneurysm with maximum diameter 5.5 cm or more [5]

B. Aortic root aneurysm with maximal ascending aortic diameter 5.5 cm or more [14]

C. DTA aneurysm, asymptomatic with **ANY** of the following:

1. Aneurysm diameter greater than or equal to 6.0 cm [9] [26]
2. Ascending aorta or aortic sinus diameter of 5.5 cm or more and chronic aortic dissection, intramural hematoma, penetrating atherosclerotic ulcer, mycotic aneurysm or pseudoaneurysm [9]
3. Bicuspid aortic valve (BAV) with DTA if the diameter of the aortic root or ascending aorta is 5.0 cm or more and a risk factor for dissection is present (eg, family history of aortic dissection or aortic growth rate of greater than or equal to 0.5 cm per year). [13]

D. Loeys-Dietz syndrome or confirmed TGFBR1 or TGFBR2 mutation **AND** an aortic diameter of 4.2 cm or more by transesophageal echocardiogram (TEE) or 4.4 cm or more by computed tomographic (CT) imaging/magnetic resonance imaging (MRI) [7]

E. Marfan syndrome and **ANY** of the following:

1. Marfan syndrome and dilated aortic root/ascending aorta external diameter of 5.0 or more, rapid growth expansion of greater 0.5 cm per year, family history of aortic dissection with diameter less than 5.0 cm OR the presence of significant aortic regurgitation. [14]
2. Marfan syndrome in woman (FBN1 mutation) contemplating pregnancy and ascending aorta or aortic root diameter is more than 4.0 cm.[14]

F. Pseudoaneurysm, thoracic aorta or postoperative pseudoaneurysm [26]

G. Saccular aneurysm [26]

H. Thoracic aortic aneurysm (TAA) and **ANY** of the following:

1. TAA, ascending, 4.5 cm or more and undergoing aortic valve repair/replacement or open cardiac surgical procedure [20] [9] [26]
2. TAA dissection, acute involving the ascending aorta (type A dissection) **NOTE:** *should be considered for urgent repair.* [9]
3. TAA, genetic (inherited/familial) and aneurysm of 5.0 cm or more [14]
4. TAA, symptomatic (eg, pain in back, abdomen, chest) [26] [12]
5. TAA is less than 5.5 cm diameter with a growth rate of more than 0.5 cm per year [7]

I. Thoracoabdominal aortic aneurysm (TAAA) and **ANY** of the following:

1. Thoracoabdominal aortic aneurysm (TAAA) diameter more than 6.0 cm (less if a connective tissue disorder is present) [15]
2. Thoracoabdominal aortic aneurysm (TAAA) rupture requiring intervention [15]

J. Type B aortic dissection, acute, complicated, when endovascular interventions are contraindicated or failure of endovascular management. [17]

II. Thoracic endovascular aortic aneurysm repair (TEVAR) contraindications or exclusions (*see section*: Contraindications and Exclusions to Thoracic Endovascular Aneurysm Repair (TEVAR).)

TEVAR Procedure Codes

Table 1. Thoracic Endovascular Aortic Aneurysm Repair (TEVAR) Associated Procedure Codes

CODE	DESCRIPTION
33875	Descending thoracic aorta graft, with or without bypass
33877	Repair of thoracoabdominal aortic aneurysm with graft, with or without cardiopulmonary bypass
33880	Endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); involving coverage of left subclavian artery origin, initial endo-prosthesis plus descending thoracic aortic extension(s), if required, to level of celiac artery origin
33881	Endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); not involving coverage of left subclavian artery origin, initial endoprosthesis plus descending thoracic aortic extension(s), if required, to level of celiac artery origin
33883	Placement of proximal extension prosthesis for endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); initial extension
33886	Placement of distal extension prosthesis(s) delayed after endovascular repair of descending thoracic aorta

Medicare Inpatient Only Codes

33875, 33877, 33880, 33881, 33883, 33886

EVAR/TEVAR Summary of Changes

Endovascular Abdominal Aortic Aneurysm Repair (EVAR)/Thoracic Endovascular Aortic Aneurysm Repair (TEVAR) guideline from 2023 to 2024 had the following changes:

- Citations updated, evidence review completed.
- The following definitions were added:
  - Ehlers-Danlos Syndrome
  - Intramural hematoma
  - Mycotic aneurysm
  - Penetrating atherosclerotic ulcer
  - Pseudoaneurysm

Definitions

Abdominal aortic aneurysm (AAA) is a 50 percent or greater increased diameter in the de-scending segment of the main artery (aorta) that supplies blood to the body accompanied with distention and weakened arterial wall.

Aneurysm occurs when part of an artery wall weakens, allowing it to abnormally balloon out or widen.

Aneurysm shape is described as being saccular or fusiform. The more common fusiform-shaped aneurysm bulges or balloons out on all sides of the blood vessel. A saccular-shaped aneurysm bulges or balloons out only on one side.

Aorta is the artery that makes up the main trunk of the arterial system which runs from the heart through the center of the chest and abdomen, and carries blood away from the heart to the rest of the body.

Aortic Aneurysm is a focal or diffuse dilatation of the aorta (the large artery that carries blood from the heart to the rest of the body) involving all three layers of the aortic wall. Aortic aneurysms can occur in the chest (thoracic aortic aneurysm) or in the abdomen (abdominal aortic aneurysm).

Aortic aneurysm rupture is a sudden break or burst of an aortic aneurysm, usually causing life-threatening internal bleeding.

Aortic dissection is a serious condition in which the integrity of the body's main artery (aorta) is compromised and blood passes through the inner lining and between the layers of the arterial wall.

Aortic dissection types:

- **Type A** is the most common and dangerous type involves a tear in the part of the aorta where it exits the heart. The tear may also occur in the upper aorta (ascending aorta), which may extend into the abdomen.
- **Type B** involves a tear in the lower aorta only (descending aorta), which may also extend into the abdomen

Ehlers-Danlos syndrome is a group of hereditary connective tissue disorders that manifests clinically with skin hyperelasticity, hypermobility of joints, atrophic scarring, and fragility of blood vessels.

Endoleak is the complication of persistent blood flow in the aneurysm sac after endovascular aneurysm repair (EVAR).

- Type I is an absence or loss of complete sealing at the proximal (type 1a) or distal (type 1b) seal zone.
- Type II is when there is retrograde flow from the lumbar and/or inferior mesenteric arteries.
- Type III is component separation or fabric disruption.
- Type IV is related to the porosity of the graft fabric.
- Type V is endotension, expanding aneurysm without demonstrable blood flow.

Endovascular aneurysm repair (EVAR) is a minimally invasive surgery used to treat an aneurysm of the abdominal aorta by placing a device called a stent graft in the artery to reinforce the aneurysm.
Horseshoe kidney is a condition in which the kidneys are fused together at the lower end or base, resulting in a "U" shape.
Intramural hematoma (IMH) is a life-threatening aortic disease that occurs when blood leaks through the innermost layer of the aortic wall. The blood flows between the inner and outer walls of the aorta, but it doesn't happen because of a tear in the wall.
Loeys-Dietz Syndrome (LDS) is a genetic disorder that affects the connective tissue in the body.
Marfan syndrome is a congenital connective tissue disorder that is primarily associated with cardiac pathology (eg, mitral valve prolapse, aortic root dilation), skeletal pathology (eg, lengthening of long bones, joint laxity) and ocular pathology (eg, ectopia lentis).
Mycotic Aneurysm the dilation of an arterial wall due to infection.
Penetrating Atherosclerotic Ulcer (PAU) an atherosclerotic lesion frequently observed in the descending thoracic aorta (DTA) and abdominal aorta (AA) in severe atherosclerotic individuals.
Pseudoaneurysm (false aneurysm) is a communication between the arterial lumen and overlying connective tissue resulting from arterial rupture; a blood-filled cavity forms outside the vessel wall and seals the leak as it thromboses. [5]
Stent graft is a tube made of thin metal mesh (the stent) covered with a thin polyester fabric (the graft) that helps prevent an aneurysm from bursting.
Thoracic endovascular aortic repair (TEVAR) is a minimally invasive surgery to treat an aneurysm in the upper part of the aorta by placing a device called a stent graft in the artery to reinforce the aneurysm.
Thoracic aortic aneurysm is an abnormal widening of the aorta between the aortic valve and the diaphragm. An aneurysm is defined as dilatation of the artery that is more than 50% of normal diameter for a given segment. Aneurysm formation is caused by a weakening of the medial layer of the aorta, which stretches outward, causing an out-pouching of the vessel wall. Thoracic aneurysms take four forms: fusiform, saccular, dissecting and false aneurysms.
Thoracoabdominal aortic aneurysm (TAAA) is bulging and weakness in the wall of the aorta that extends from the chest into the abdomen.

Abdominal Aneurysm Repair References

[5]Merck & Co., Inc., "Overview of Aortic Aneurysms.". [Online]. Available: www.merckmanuals.com

[1] (2020). Abdominal aortic aneurysm: diagnosis and management. *NICE (National Institute for Health and Care Excellence)*. Retrieved: March 2024. https://www.clinicalkey.com/#!/content/nice_guidelines/65-s2.0-NG156.

[2] Ameli-Renani, S., Pavlidis, V. & Morgan, R. (2020). Secondary Endoleak Management Following TEVAR and EVAR. *Cardiovascular and Interventional Radiology, 43*, 1839-1854.

[3] (2022). Surgical Risk Calculator. *American College of Surgeons*. Retrieved: March 2024. http://www.riskcalculator.facs.org/RiskCalculator/PatientInfo.jsp

[4] Archer, C.W. & Wynn, M. (2023). Thoracic and Thoracoabdominal Aneurysms: Open Surgical Treatment. A.N. Sidawy (Eds.). *Rutherford's Vascular Surgery and Endovascular Therapy* (10). (pp. 1027-1048). Philadelphia, PA: Elsevier

[5] Arnaoutakis, D.J. & Schanzer, A. (2023). Aortic Stent Graft and Endovascular Treatment of Thoracoabdominal and Aortic Arch Aneurysms: Strategies for Operative Repair. A.N. Sidawy (Eds.). *Rutherford's Vascular Surgery and Endovascular Therapy* (10). (pp. 1027-1048). Philadelphia, PA: Elsevier

[6] Bonci, G., Steigner, M.L., . . . Dill, K.E. (2017). ACR Appropriateness Criteria Thoracic Aorta Interventional Planning and Follow-Up. *Journal of the American College of Radiology, 14*(11S), S570-S583.

[7] Braverman, A.C. & Schermerhorn, M. (2022). Diseases of the Aorta. P. Libby & R.O. Bonow (Eds.). *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine* (12), (pp. 806-836). Philadelphia, PA: Elsevier

[8] Chaikof, E.L., Dalman, R.L., . . . Starnes, B.W. (2018). The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *Journal of Vascular Surgery, 67*(1), 2-77.

[9] DeAnda, A., Worsham, J. & Mell, M. (2022). The Aorta. C.M. Townsend, R.D. Beauchamp, . . . Mattox, K.L. (Eds.). *Sabiston Textbook of Surgery* (21). (pp. 1744-1766). Philadelphia: Elsevier.

[10] Erbel, R., Aboyans, V., . . . Kravchenko, I. (2014). 2014 ESC Guidelines on the diagnosis and treatment of aortic diseases: Document covering acute and chronic aortic diseases of the thoracic and abdominal aorta of the adult The Task Force for the Diagnosis and Treatment of Aortic Diseases of the European Society of Cardiology (ESC). *European Heart Journal, 35*. (41), 2873-2926.

[11] Gul, F. & Patel, P.M. (2024). Abdominal Aortic Aneurysm. F.F. Ferri (Ed.). *Ferri's Clinical Advisor 2024* . (pp. 3-6). Philadelphia, PA: Elsevier

[12] Gulati, M., Levy, P.D., . . . Shaw, L.J. (2021). 2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation, 144*(22), 368-454.

[13] Halperin, J.L., Levine, G.N., . . . Wijeysundera, D.N. (2016). Surgery for Aortic Dilation in Patients with Bicuspid Aortic Valves. *Journal of the American College of Cardiology, 67*(6), 724-731.

[14] Hiratzka, L.F., Bakris, G.L., . . . Williams, D.M. (2010). ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the Diagnosis and Management of Patients With Thoracic Aortic Disease. *Circulation, 121*(13), e266-e369.

[15] Isselbacher, E.M., Preventza, O., . . . Woo, Y.J. (2022). 2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease. *JACC (Journal of the American College of Cardiology), 80*(24), e223–e393.

[16] Lombardi, J.V., Hughes, G.C., . . . Wang, G.J. (2020). Society for Vascular Surgery (SVS) and Society of Thoracic Surgeons (STS) Reporting Standards for Type B Aortic Dissections. *The Annals of Thoracic Surgery, 109*(3), 959-981.

[17] MacGillivray, T. E., Gleason, T. G., . . . Stulak, J. (2022). The Society of Thoracic Surgeons/American Association for Thoracic Surgery Clinical Practice Guidelines on the Management of Type B Aortic Dissection. *Annals of Thoracic Surgery, 113*(4), 1073-1092.

[18] (2020). Abdominal aortic aneurysm: diagnosis and management. *National Institute for Health and Care Excellence (NICE)*. Retrieved: March 2024. https://www.nice.org.uk/guidance/ng156/resources/abdominal-aortic-aneurysm-diagnosis-and-management-pdf-66141843642565

[19] Neschis, D.G. (2024). Aortic Disease: Aneurysm and Dissection. R.D. Kellerman & D.P. Rakel (Eds.). *Conn's Current Therapy 2024*, (pp. 105-109). Philadelphia, PA: Elsevier

[20] Otto, C.M., Nishimura, R.A., . . . Toly, C. (2020). 2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease. *Circulation, 143*(5), e72-e227.

[21] Parsa, P., Gupta, J.D., . . . Chandra, V. (2021). Endotension: What do we know and not know about this enigmatic complication of endovascular aneurysm repair. *Journal of Vascular Surgery, 74*(2), 639-645.

[22] Roy, R.A., Pruitt, E.Y. & Upchurch, G.R. (2023). Aortoiliac Aneurysms: Evaluation, Decision Making, and Medical Management. A.N. Sidawy (Eds.). *Rutherford's Vascular Surgery and Endovascular Therapy* (10). (pp. 914-924). Philadelphia, PA: Elsevier

[23] Schanzer, A. & Malka, K.T. (2023). Aortoiliac Aneurysms: Endovascular Treatment. A.N. Sidawy (Eds.). *Rutherford's Vascular Surgery and Endovascular Therapy* (10). (pp. 960-975). Philadelphia, PA: Elsevier

[24] Senser, E.M., Misra, S. & Henkin, S. (2021). Thoracic Aortic Aneurysm. *Cardiology Clinics, 39*(4), 505-515.

[25] Spanos, K., Nana, P., . . . Kolbel, T. (2020). Management of Abdominal Aortic Aneurysm Disease: Similarities and Differences Among Cardiovascular Guidelines and NICE Guidance. *Journal of Endovascular Therapy, 27*(6), 889-901.

[26] Swerdlow, N.J., Wu, W.W. & Schermerhorn, M.L. (2019). Open and Endovascular Management of Aortic Aneurysms. *Circulation Research, 124*(4), 647-661.

[27] (2022). SVS VQI Risk Calculators. *Vascular Quality Initiative*. Retrieved: March 2024. https://www.vqi.org/resources/vqi-risk-calculators-2/

[28] Swerdlow, N.J., Wu, W.W. & Schermerhorn, M.L. (2019). Open and Endovascular Management of Aortic Aneurysms. *Circulation Research, 124*(4), 647-661.

[29] Upchurch, G.R., Escobar, G.A., . . . Wang, G.J. (2021). Society for Vascular Surgery clinical practice guidelines of thoracic endovascular aortic repair for descending thoracic aortic aneurysms. *Journal of Vascular Surgery, 73*(1), 55S-83S.

[30] Wanhainen, A., Van Herzeele, I., . . . Tsilimparis N. (2024) . European Society for Vascular Surgery (ESVS) 2024 Clinical Practice Guidelines on the Management of Abdominal Aorto-iliac Artery Aneurysms. *European Journal of Vascular and Endovascular Surgery, 67*(1), 192-331

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