Cohere Medicare Advantage Policy - Descending and Abdominal Aortic Aneurysm Repair

Clinical Guidelines for Medical Necessity Review

Version: 3
Revision Date: June 26, 2025

Important Notices

Notices & Disclaimers:

GUIDELINES ARE SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION-MAKING OF END USERS.

Cohere Health, Inc. ("**Cohere**") has published these clinical guidelines to determine the medical necessity of services (the "**Guidelines**") for informational purposes only, and solely for use by Cohere's authorized "**End Users**". These Guidelines (and any attachments or linked third-party content) are not intended to be a substitute for medical advice, diagnosis, or treatment directed by an appropriately licensed healthcare professional. These Guidelines are not in any way intended to support clinical decision-making of any kind; their sole purpose and intended use is to summarize certain criteria Cohere may use when reviewing the medical necessity of any service requests submitted to Cohere by End Users. Always seek the advice of a qualified healthcare professional regarding any medical questions, treatment decisions, or other clinical guidance. The Guidelines, including any attachments or linked content, are subject to change at any time without notice. This policy may be superseded by existing and applicable Centers for Medicare & Medicaid Services (CMS) statutes.

Other Notices:

Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein.

Guideline Information:

Specialty Area: Cardiovascular Disease
Policy Name: Cohere Medicare Advantage Policy - Descending and Abdominal Aortic Aneurysm Repair
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

Table of Contents

Medical Necessity Criteria

Service: Descending and Abdominal Aortic Aneurysm Repair

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.[1]

- There are no applicable NCDs and/or LCDs for descending and abdominal aortic aneurysm repair.
  - Billing and Coding Article: Endovascular Repair of Aortic and/or Iliac Aneurysms (A53124).

Description

The descending and abdominal aorta are the part of the aorta that travels downward from the aortic arch, passing through the belly and bifurcating into the iliac arteries in the pelvis. An aortic aneurysm occurs when the wall of the aorta becomes weakened and expands outward. Because the aorta is the largest artery in the body and is highly pressurized, the aneurysmal portion may rupture - or dissect - and cause serious, life-threatening sequelae, such as rapid blood loss or poor perfusion of extremities and vital organs that may result in death. To mitigate this risk, aortic aneurysms are often prophylactically repaired. Depending on the type of repair, the patient may or may not be placed on mechanical cardiopulmonary bypass during the operation in order to survive an extended interruption of blood flow to the vital organs while the surgeon is working on the aorta. In an open surgical repair (OSR), the surgeon directly visualizes and repairs/excises the aneurysm. Endovascular aortic repair (EVAR) is a minimally invasive method of repairing the aorta and is known as TEVAR (thoracic EVAR) when it occurs in the thoracic region. The surgeon accesses the aorta by placing a catheter in the groin and deploying a stent graft to the affected portion of the aorta. The stent graft self-expands to support the diseased aorta, prevent dissection, and restore blood flow. Hybrid repair may also be performed, involving a combination of both open and endovascular techniques. The surgeon is best positioned to choose the most appropriate treatment (OSR, EVAR/TEVAR, or

hybrid repair) for the patient based on their individual anatomic and clinical factors.[2-5]

Medical Necessity Criteria

Indications

Descending thoracic and abdominal aortic repair (OSR, EVAR/TEVAR, or hybrid repair) or endovascular arterial repair is considered appropriate if **ALL** of the following is **TRUE**:

- This is an FDA-approved device; **AND**
- **ANY** of the following:
  - **ANY** of the following pathologies, provided that the treating clinician deems the patient to be an appropriate candidate for repair:
    - Symptomatic or ruptured aneurysms[2-4]; **OR**
    - Pseudoaneurysms[2-4]; **OR**
    - Intramural hematomas[2-4]; **OR**
    - Penetrating ulcers[2-4]; **OR**
  - Abdominal aortic aneurysm (AAA), including **ANY** of the following[2-4]:
    - Asymptomatic fusiform abdominal aortic aneurysms (greater than 5.5 cm in males or greater than 5 cm in females); **OR**
    - All saccular aneurysms in patients with a reasonable life expectancy; **OR**
    - Aneurysm that expands by more than 1.0 cm within 12 months or by more than 0.5 cm in 6 months; **OR**
    - AAA with concomitant Iliac artery aneurysm of at least 3.5 cm, even if the AAA has not reached the above size threshold[2]; **OR**
  - Asymptomatic fusiform descending thoracic or thoracoabdominal aneurysms with **ANY** of the following[2-4]:
    - A fusiform aortic diameter greater than 5.5 cm; **OR**
    - A saccular aneurysm; **OR**
    - Any surgical risk at a diameter of 5.5 cm; **OR**
    - Patients who require chemotherapy, radiation therapy, or solid organ transplant, and who are deemed to be at low to moderate perioperative risk (with a reasonable life expectancy) with **ANY** of the following:
      - A fusiform aortic aneurysm measuring between 4 and 5.4 cm; **OR**
      - A saccular aneurysm; **OR**

        - Documented rapid thoracic or thoracoabdominal expansion defined as **ANY** of the following:
            - Greater than or equal to 0.5 cm in 12 months; **OR**
            - Greater than or equal to 0.3 cm in 12 months for those with heritable thoracic aortic disease (including but not limited to Marfan Syndrome, Vascular Ehlers-Danlos Syndrome [VEDS], Loeys-Dietz Syndrome, or Turner Syndrome) or bicuspid aortic valve (BAV); **OR**
        - Patients with genetically mediated aortic diseases or bicuspid aortic valves may be appropriate for repair at an aortic diameter of less than 5.5 cm (the specific threshold diameter depends on the underlying medical condition); **OR**
    - Iliac artery aneurysm (IAA) with **ANY** of the following[2-4]:
        - Rapidly expanding IAA (at least 7 mm in six months or at least 1 cm in 12 months); **OR**
        - Asymptomatic IAA of at least 3.5 cm[6-8]; **OR**
    - Visceral aneurysm with **ANY** of the following[5]:
        - Hepatic artery aneurysm with **ANY** of the following:
            - Size greater than 2 cm; **OR**
            - Growth of at least 0.5/cm within 12 months; **OR**
        - All pancreaticoduodenal and gastroduodenal artery aneurysms, regardless of size; **OR**
        - All superior mesenteric artery aneurysms, regardless of size; **OR**
        - Jejunal and ileal artery aneurysms that are at least 2 cm; **OR**
        - All gastric and gastroepiploic artery aneurysms, regardless of size; **OR**
        - All colic artery aneurysms, regardless of size; **OR**
        - Renal artery aneurysms with **ANY** of the following:
            - Size greater than 3 cm; **OR**
            - Aneurysms of all sizes for **ANY** of the following:
                - Women of childbearing age; **OR**
                - Patients with refractory hypertension and renal artery stenosis; **OR**
        - Celiac artery aneurysms with **ANY** of the following:
            - All pseudoaneurysms; **OR**
            - Size greater than 2 cm; **OR**
        - Splenic artery aneurysms with **ANY** of the following:
            - All pseudoaneurysms; **OR**

        - Size greater than 3 cm; **OR**
        - All sizes for women of childbearing age; **OR**
    - Traumatic aortic disruptions, including **ANY** of the following:
        - Grade I: small intimal defect; observation versus repair; **OR**
        - Grade II: intramural hematoma; TEVAR within 24 hours; **OR**
        - Grade III: pseudoaneurysms; immediate TEVAR; **OR**
        - Grade IV: evidence of contained or frank aortic rupture; immediate TEVAR; **OR**
    - Complications from a previous aortic repair[2-4]; **OR**
    - Infected/mycotic aneurysm[2-4]; **OR**
    - Aneurysm associated with aortitis[2-4]; **OR**
    - Open repair following EVAR of acute type B aortic dissection with genetically mediated aortic diseases.[2-4]

Non-Indications

Descending thoracic and abdominal aortic repair (OSR, EVAR/TEVAR, and hybrid repair) is NOT considered appropriate if **ANY** of the following is **TRUE**[2-4]:

- Aortic aneurysm size less than 3 cm (excluding saccular aneurysms), unless otherwise stated; **OR**
- Limited life expectancy; **OR**
- Prohibitive surgical risk.

Level of Care Criteria

Inpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	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 (e.g., aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); involving coverage of left subclavian artery origin, initial endoprosthesis plus descending thoracic aortic extension(s), if required, to level of celiac artery origin

33881	Endovascular repair of descending thoracic aorta (e.g., 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 (e.g., aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); initial extension
33884	Placement of proximal extension prosthesis for endovascular repair of descending thoracic aorta (eg, aneurysm, pseudoaneurysm, dissection, penetrating ulcer, intramural hematoma, or traumatic disruption); each additional proximal extension (List separately in addition to code for primary procedure)
33886	Placement of distal extension prosthesis(s) delayed after endovascular repair of descending thoracic aorta
34701	Endovascular repair of infrarenal aorta by deployment of an aorto-aortic tube endograft including pre-procedure sizing and device selection, all non selective 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 (e.g., 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 non selective 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 (e.g., 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 non selective 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 (e.g., 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 non selective 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 (e.g., 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 non selective 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 (e.g., for aneurysm, pseudoaneurysm, dissection, penetrating ulcer)
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 non selective 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 (e.g., 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 (e.g., 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 (e.g., 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 (e.g., 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 (e.g., 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 (e.g., 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 (e.g., 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 (e.g., 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])
34848	Endovascular repair of visceral aorta and infrarenal abdominal aorta (e.g., 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])

Disclaimer: S Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Evaluation of Clinical Harms and Benefits

Clinical determinations for Medicare Advantage beneficiaries are made in accordance with 42 CFR 422.101 guidance outlining CMS's required approach to decision hierarchy in the setting of NCDs/LCDs identified as being "not fully established". When clinical coverage criteria are "not fully established," Medicare Advantage organizations are instructed to create publicly accessible clinical coverage criteria based on widely accepted clinical guidelines and/or scientific studies backed by a robust clinical evidence base. Clinical coverage criteria provided by Cohere Health in this manner include coverage rationale and risk/benefit analysis.

The potential clinical harms of using these criteria for **descending thoracic and abdominal aortic repair (OSR, EVAR/TEVAR, or hybrid repair)** may include:

- Adverse effects from delayed or denied treatment. Patients with aortic conditions require prompt risk stratification, individualized plan-of-care counseling, and treatment. This is particularly important as some aortopathies are characterized by rapid growth; aneurysmal size may become dangerously large in a relatively short period, conferring a higher risk of dissection, which may result in such complications as malperfusion syndrome and death.[2]
- Risks with inappropriate surgical procedures: Aortic repair is not a benign procedure and, if performed on a suboptimal patient, may confer serious complications. Risks include spinal cord ischemia, infection, bleeding, injury to neurovascular structures, death, anesthetic risk, and the need for repeat or additional procedures due to complications.[2]

The clinical benefits of using these criteria for **descending thoracic and abdominal aortic repair (OSR, EVAR/TEVAR, or hybrid repair)** may include:

- Improved patient selection resulting in better long-term outcomes. Patients with certain disease characteristics - including aneurysmal size and location, growth rate, disease etiology, and few comorbidities - are ideal for an endovascular approach. As a minimally invasive procedure, endovascular repair requires a shorter recovery time and is associated with fewer complications than traditional open surgery repair, which often requires substantial exposure of the abdominopelvic cavity, as well as lengthy operating times and the potential for cardiopulmonary bypass

support. Certain patients - younger patients, those with genetically driven aortic disease - are more appropriate for open surgical repair. Surgical repair of the aortic aneurysm may be definitive, effectively eliminating the long-term risk of aortic rupture and subsequent morbidity and mortality.[2,3]

- Maintenance of rigorous patient safety standards aligned to best available evidence. Patients who undergo repair of a descending/abdominal aortic aneurysm of less than 3 centimeters have a low risk of rupture relative to the higher risk of sustaining complications during surgery (anesthetic complications, bleeding, infection, nerve damage, spinal cord injury, stroke, embolism), which does not usually outweigh the potential benefit of aortic repair. The same is true, more generally, of patients with a limited life expectancy or prohibitive surgical risk - the risk of surgery itself does not outweigh the benefit of aortic repair in these populations.[2,3]
- Appropriate allocation of healthcare resources at the individual beneficiary and population levels.

Medical Evidence

Sharples et al. (2022) conducted a prospective study to evaluate the management and timing of intervention for patients with untreated thoracic aortic aneurysms. From 2014 to 2018, a prospective study was carried out on adult patients with new or existing arch or descending thoracic aortic aneurysms with a diameter of at least 4 centimeters. A total of 886 patients were enrolled and monitored until death, intervention, or withdrawal from the study. Various outcomes were evaluated, including aneurysm growth, survival, quality of life, and hospital admissions. Findings indicated that the maximum aneurysm diameter was predominantly in the descending aorta among 82% of patients, with an annual growth rate of 0.2 cm. Throughout the follow-up period, 129 patients died, with 64 deaths attributed to aneurysm-related events. After adjusting for age, sex, and New York Heart Association dyspnea index, the risk of death escalated with aneurysm size at baseline and with aneurysmal growth. Additionally, hospital admissions rose with aneurysm size. While quality of life decreased annually with age and current smoking, there was no association between aneurysm size and changes in quality of life. The study proposed that international guidelines contemplate extending monitoring intervals to 12 months for small aneurysms and raising intervention thresholds. Decisions regarding surveillance and intervention should be tailored, taking into consideration individual factors such as age, sex, size, growth, patient characteristics, and surgical risk.[9]

McCarthy et al. (2021) performed a systematic meta-analysis to assess and compare the efficacy of endovascular stent grafting (ESG) versus open surgical repair (OSR) in managing arch or descending thoracic aortic aneurysms (TAA). A comprehensive search of relevant studies compared ESG and OSR, encompassing randomized controlled trials (RCTs), quasi-randomized trials, and non-RCTs. Five comparative cohort studies were included, with a total of 3,955 ESG and 21,197 OSR patients. A comprehensive review of unadjusted short-term (30-day) all-cause mortality indicated a preference for ESG. Upon conducting sensitivity analysis on four studies focused solely on descending TAA, no statistical significance was found, although moderate heterogeneity persisted. When adjusted, the meta-analysis of short-term all-cause mortality favored ESG, with no observed heterogeneity. In longer-term follow-ups (beyond 30 days), survival

from all-cause mortality favored OSR in larger studies while favoring ESG in smaller ones. Additionally, freedom from reintervention in the longer term favored OSR. Studies reporting on short-term non-fatal complications suggested a lower incidence following ESG. The authors stressed the need for high-quality evidence alongside society guidelines, as available research is limited and increasingly outdated. They also noted the importance of individualized patient counseling, particularly for aortic disease of hereditary etiology, as these patients are recommended for OSR on current society guidelines.[10]

References

1. Centers for Medicare & Medicaid Billing Services (CMS). Billing and Coding: Endovascular Repair of Aortic and/or Iliac Aneurysms (A53124). Revision effective date January 1, 2015. https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleId=53124
2. Isselbacher EM, Preventza O, Black III JH, 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. *Circulation*. 2022 Dec 13;146(24):e334-e482. doi: 10.1161/CIR.0000000000001106. PMID: 36322642; PMCID: PMC9876736
3. Chaikof EL, Dalman RL, Eskandari MK, et al. The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *J Vasc Surg*. 2018 Jan;67(1):2-77.e2. doi: 10.1016/j.jvs.2017.10.044. PMID: 29268916
4. Upchurch Jr GR, Escobar GA, Azizzadeh A, et al. The Society for Vascular Surgery clinical practice guidelines of thoracic endovascular aortic repair for descending thoracic aortic aneurysms. *J Vasc Surg*. 2021 Jan 1;73(1):55S-83S
5. Chaer RA, Abularrage CJ, Coleman DM, et al. The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms. *J Vasc Surg*. 2020 Jul 1;72(1):3S-9S
6. Huang Y, Gloviczki P, Duncan AA, et al. Common iliac artery aneurysm: Expansion rate and results of open surgical and endovascular repair. *J Vasc Surg*. 2008 Jun 1;47(6):1203-11
7. Wanhainen A, Verzini F, Van Herzeele I, et al. European Society for Vascular Surgery (ESVS) 2019 clinical practice guidelines on the management of abdominal aorto-iliac artery aneurysms. *Euro J Vasc Endovasc Surg*. 2019 Jan 1;57(1):8-93
8. Charisis N, Bouris V, Rakic A, Landau D, Labropoulos N. A systematic review on endovascular repair of isolated common iliac artery

aneurysms and suggestions regarding diameter thresholds for intervention. *J Vasc Surg.* 2021 Nov 1;74(5):1752-62

9. Sharples L, Sastry P, Freeman C, et al. Aneurysm growth, survival, and quality of life in untreated thoracic aortic aneurysms: The effective treatments for thoracic aortic aneurysms study. *Eur Heart J*. 2022 Jul 1;43(25):2356-2369. doi: 10.1093/eurheartj/ehab784. PMID: 34849716; PMCID: PMC9246658
10. McCarthy A, Gray J, Sastry P, et al. Systematic review of endovascular stent grafting versus open surgical repair for the elective treatment of arch/descending thoracic aortic aneurysms. *BMJ Open*. 2021 Mar 4;11(3):e043323. doi: 10.1136/bmjopen-2020-043323. PMID: 33664076; PMCID: PMC7934769
11. Swerdlow NJ, Wu WW, Schermerhorn ML. Open and endovascular management of aortic aneurysms. *Circ Res*. 2019 Feb 15;124(4):647-661. doi: 10.1161/CIRCRESAHA.118.313186. PMID: 30763206
12. Faizer R, DeRose G, Lawlor DK, et al. Objective scoring systems of medical risk: A clinical tool for selecting patients for open or endovascular abdominal aortic aneurysm repair. *J Vasc Surg.* 2007;45(6):1102-1108.e2. https://doi.org/10.1016/j.jvs.2007.02.036
13. Acharya M, Maselli D, Mariscalco G. Genetic screening in heritable thoracic aortic disease-rationale, potentials and pitfalls. *Indian J Thorac Cardiovasc Surg*. 2022 Apr;38(Suppl 1):24-35. doi: 10.1007/s12055-020-01124-7. PMID: 35463717; PMCID: PMC8980988
14. Mastracci TM, Greenberg RK, Hernandez AV, et al. Defining high risk in endovascular aneurysm repair. *J Vasc Surg*. 2010 May;51(5):1088-1095.e1. doi: 10.1016/j.jvs.2009.12.026. PMID: 20420976
15. Lindsay ME, Dietz HC. The genetic basis of aortic aneurysm. *Cold Spring Harbor Persp in Med*. 2014 Sep 1;4(9):a015909
16. Khoury MK, Acher C, Wynn MM, Acher CW. Long-term survival after descending thoracic and thoracoabdominal aortic aneurysm repair. *J Vasc Surg*. 2021 Sep 1;74(3):843-50
17. Karaolanis GI, Antonopoulos CN, Charbonneau P, et al. A systematic review and meta-analysis of stroke rates in patients undergoing thoracic endovascular aortic repair for descending thoracic aortic aneurysm and type B dissection. *J Vasc Surg*. 2022 Jul 1;76(1):292-301

18. Salem O, El Beyrouti H, Mulorz J, et al. Predictors for reintervention and survival during long-term follow-up after thoracic endovascular aortic repair for descending thoracic aortic aneurysm. *J Vasc Surg*. 2024 Nov 1;80(5):1408-17
19. Allievi S, Rastogi V, Yadavalli SD, et al. Sex-related outcomes after thoracic endovascular repair for intact isolated descending thoracic aortic aneurysm: A retrospective cohort study. *Ann Surg*. 2024 Jul 1;280(1):165-72
20. Schanzer A, Oderich GS. Management of abdominal aortic aneurysms. *NEJM*. 2021 Oct 28;385(18):1690-8
21. Perini P, Mariani E, Fanelli M, et al. Surgical and endovascular management of isolated internal iliac artery aneurysms: A systematic review and meta-analysis. *Vasc and Endovasc Surg*. 2021 Apr;55(3):254-64.
22. van der Veen D, Holewijn S, Bellosta R, et al. One year outcomes of an international multicentre prospective cohort study on the Gore Excluder iliac branch endoprosthesis for aorto-iliac aneurysms. *Euro J Vasc Endovasc Surg*. 2021 Aug 1;62(2):177-85
23. Charisis N, Bouris V, Rakic A, Landau D, Labropoulos N. A systematic review on endovascular repair of isolated common iliac artery aneurysms and suggestions regarding diameter thresholds for intervention. *J Vasc Surg*. 2021 Nov 1;74(5):1752-62
24. Turchino D, Peluso A, Accarino G, et al. A multicenter experience of three different iliac branched stent grafts for the treatment of aorto-iliac and/or iliac aneurysms. *Ann Vasc Surg.* 2023 Aug 1;94:331-40
25. Steenberge SP, Caputo FJ, Rowse JW, et al. Natural history and growth rates of isolated common iliac artery aneurysms. *J Vasc Surg*. 2022 Aug 1;76(2):461-5
26. Staniforth E, Dubey S, Ttofi I, et al. Aortitis increases the risk of surgical complications and reoperations after major aortic surgery. *J Cardiovasc Dev Dis*. 2024 Dec 17;11(12):405
27. Warner D, Holmes KW, Afifi R, et al. Emergency vascular surgical care in populations with unique physiologic characteristics: Pediatric, pregnant, and frail populations. *Sem Vasc Surg.* 2023 Jun 1 (Vol. 36, No. 2, pp. 340-354)

28. Pugh D, Grayson P, Basu N, Dhaun N. Aortitis: Recent advances, current concepts and future possibilities. *Heart*. 2021 Oct 1;107(20):1620-9
29. Espitia O, Blonz G, Urbanski G, et al. Symptomatic aortitis at giant cell arteritis diagnosis: a prognostic factor of aortic event. *Arthritis Res Ther*. 2021 Dec;23:1-7
30. Espitia O, Bruneval P, Assaraf M, et al. Long-term outcome and prognosis of noninfectious thoracic aortitis. *JACC*. 2023 Sep 12;82(11):1053-64
31. Rhee R, Oderich G, Han S, et al. One-year results of the Gore Excluder conformable AAA endoprosthesis system in the United States, regulatory trial. *J Vasc Surg*. 2022 Oct 1;76(4):951-9
32. Cifuentes S, Mendes BC, Tabiei A, et al. Management of endoleaks after elective infrarenal aortic endovascular aneurysm repair: A review. *JAMA Surg*. 2023 Sep 1;158(9):965-73
33. Wang LJ, Prabhakar AM, Kwolek CJ. Current status of the treatment of infrarenal abdominal aortic aneurysms. *Cardiovasc Diag Ther*. 2018 Apr;8(Suppl 1):S191
34. Diender E, Vermeulen JJ, Pisters R, et al. Major adverse cardiac events after elective infrarenal endovascular aortic aneurysm repair. *J Vasc Surg*. 2022 Dec 1;76(6):1527-36
35. Massoni CB, Ancetti S, Perini P, et al. Infrarenal EVAR for penetrating aortic ulcer: A comparative study with abdominal aortic aneurysm. *Ann Vasc Surg*. 2023 Jan 1;88:327-36
36. Rastogi V, O'Donnell TF, Marcaccio CL, et al. One-year aneurysm-sac dynamics are associated with reinterventions and rupture following infrarenal endovascular aneurysm repair. *J Vasc Surg*. 2024 Feb 1;79(2):269-79
37. Piazza M, Squizzato F, Porcellato L, et al. Predictors of intervention in acute type B aortic penetrating ulcer and intramural hematoma. *Sem in Thorac Cardiovasc Surg.* 2024 Mar 1 (Vol. 36, No. 1, pp. 1-10)
38. DeCarlo C, Latz CA, Boitano LT, et al. Prognostication of asymptomatic penetrating aortic ulcers: A modern approach. *Circulation*. 2021 Oct 5;144(14):1091-101

39. Sorber R, Hicks CW. Diagnosis and management of acute aortic syndromes: Dissection, penetrating aortic ulcer, and intramural hematoma. *Curr Cardiol Rep*. 2022 Mar;24(3):209-16
40. Dev R, Gitanjali K, Anshuman D. Demystifying penetrating atherosclerotic ulcer of aorta: Unrealised tyrant of senile aortic changes. *J Cardiovasc Thorac Res*. 2021 Jan 30;13(1):1
41. Shao T, Bornak A, Kang N. Penetrating aortic ulcer and aortic intramural hematoma: Treatment strategy. *Vascular*. 2023 Dec;31(6):1086-93
42. Wang B, Qiu C, Yu X, et al. Abdominal penetrating aortic ulcer and endovascular treatments: A systematic review and meta-analysis. *Vasc Endovasc Surg*. 2023 Nov;57(8):838-47

Clinical Guideline Revision History/Information

Original Date: May 29, 2024		
Review History		
Version 2	6/11/2024	• 422.101 Disclaimer added
Version 3	6/26/2025	Annual policy review & restructuring. Simplified indications by removing redundant indications that were already captured elsewhere. Removed “infectious” qualifier for aortitis to allow approval for giant cell aortitis and Takayasu arteritis. Added visceral aneurysm criteria directly from professional society guidance. Added iliac artery criteria directly from professional society guidance. Literature review - description, medical evidence updated (including references).