Descending Thoracic and Abdominal Aortic Repair - Single Service

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Guideline Information:

Specialty Area: Cardiovascular Disease
Guideline Name: Descending Thoracic and Abdominal Aortic Repair (Single Service)

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Medical Necessity Criteria

Service: Descending Thoracic and Abdominal Aortic Repair

General Guidelines

- **Surgical Repair Units, Frequency, & Duration:** Once.
- **Criteria for Subsequent Requests:** Endovascular aneurysm repairs (EVAR/TEVAR) that develop complications (e.g., endograft migration or endoleaks) in the postoperative surveillance phase may be candidates for re-intervention. Reintervention is rarely needed after open surgical repair (OSR).
- **Recommended Clinical Approach:** The surgeon is best positioned to choose the most appropriate treatment (OSR, EVAR/TEVAR, or hybrid repair) for the patient based on anatomic and clinical factors. EVAR/TEVAR is increasingly performed percutaneously, but there are clinical circumstances where surgical intervention is necessary to facilitate EVAR/TEVAR (e.g., a hybrid approach).

Medical Necessity Criteria

Indications

➔ **Descending thoracic and abdominal aortic repair (OSR, EVAR/TEVAR, and hybrid repair)** is considered appropriate if **ANY** of the following is **TRUE**[1-3]:

- All symptomatic or ruptured aortic aneurysms deemed by the treating clinician to be appropriate candidates for repair; **OR**
- Asymptomatic fusiform abdominal aortic aneurysms greater than 5.5 cm in males (or greater than 5 cm in females) and all saccular aneurysms in low to moderate-risk patients with a reasonable life expectancy[4]; **OR**
- Asymptomatic fusiform descending thoracic or thoracoabdominal aneurysms with **ANY** of the following:
  - Low to moderate-risk patients with **ANY** of the following:
    - A fusiform aortic diameter greater than 5.5 cm; **OR**
    - A saccular aneurysm; **OR**
  - High-risk surgical patients with an aortic diameter greater than 6 cm[5]; **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 aneurysm expansion defined as **ANY** of the following[6-7]:
    - Greater than or equal to 0.5 cm in one year; **OR**
    - Greater than or equal to 0.3 cm in 1 year for those with heritable thoracic aortic disease or bicuspid aortic valve (the specific growth criteria depends on the underlying medical condition); **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)[1-2]; **OR**

◆ All pseudoaneurysms deemed by the treating clinician to be appropriate candidates for repair; **OR**
◆ All penetrating ulcers deemed by the treating clinician to be appropriate candidates for repair; **OR**
◆ Traumatic aortic disruptions, including **ANY** of the following:
- Grade I: small intimal defect; observation v 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.

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**[1-4,8]:
◆ Aortic aneurysm size less than 3 cm (excluding saccular aneurysms); **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])

Medical Evidence

Sharples et al. (2022) conducted a prospective study to evaluate the management and timing of intervention concerning patients afflicted with untreated thoracic aortic aneurysms. From 2014 to 2018, a prospective study was carried out on patients aged greater than or equal to 18 years who had either new or existing arch or descending thoracic aortic aneurysms with a diameter of greater than or equal to 4 cm. 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 assessed using the EQ-5D-5L utility index, 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. Aneurysms greater than or equal to 4 cm in the arch increased by 0.07 cm annually. Baseline diameter correlated with age and comorbidities, and no clinical growth correlates were identified. Throughout the follow-up period, 129 patients passed away, 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 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 proposes 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, considering factors such as age, sex, size, growth, patient characteristics, and surgical risk.[7]

McCarthy et al. (2021) performed a systematic meta-analysis to assess and compare the efficacy of endovascular stent grafting (ESG) vs open surgical repair (OSR) in managing chronic arch or descending thoracic aortic aneurysms (TAA). A comprehensive search was conducted of relevant studies comparing ESG and OSR, encompassing various study designs such as randomized controlled trials (RCTs), quasi-randomized trials, and non-RCTs. Comparative cohort studies and case-control studies that were matched based on key outcomes were also included. A total of five comparative cohort studies were included with a total of 3955 ESG and 21,197 OSR patients. A comprehensive review of unadjusted short-term (30-day) all-cause mortality indicates a preference for ESG. However, there is notable heterogeneity observed between larger and smaller studies. Upon conducting sensitivity analysis on four studies focusing solely on descending TAA, no statistical significance was found, although moderate heterogeneity

persisted. When adjusted for, 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 suggest a lower incidence following ESG. The authors stress the need for high-quality evidence as available research is limited and increasingly outdated that compares ESG and OSR in managing elective arch and/or aneurysms of the descending TAA.[9]

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