An abdominal aortic aneurysm (AAA) is a potentially fatal abnormal swelling (often balloon-like) of a segment of the body’s largest artery, the aorta. The wall of the artery bulges out rather than remaining straight.¹

Abdominal aortic aneurysms affect 4% to 8% of older men and 0.5% to 1.5% of older women.²⁻⁶

Older age, smoking, male sex, and family history are the most significant AAA risk factors.²⁻⁶

Approximately 69% of men in the United States age 65 to 74 years have a history of smoking (defined as lifetime consumption of more than 100 cigarettes) and are therefore at risk for AAA.⁷

Although AAAs may be asymptomatic for years, as many as 1 in 3 eventually rupture if left untreated.⁸

Voluntary AAA screening may reduce AAA-related mortality by 43% in men age 65 to 75 years.⁹ Therefore, it is particularly important that employers who provide retiree health care coverage or who have active employees over the age of 65 provide coverage for AAA screening.

In 2003, AAA (without rupture) was responsible for $2.7 billion in hospital charges and AAA rupture was responsible for an additional $639.71 million. Each patient treated for AAA (without rupture) costs more than $59,000; each hospital-treated patient with an AAA rupture costs more than $93,000.¹⁰

The average cost of elective surgery following AAA screening is $25,000; the average cost of emergency AAA surgery following a rupture is approximately $50,000.¹¹

The U.S. Preventive Services Task Force (USPSTF) recommends one-time screening for abdominal aortic aneurysm (AAA) by ultrasonography in men aged 65 to 75 who have ever smoked.¹²

The USPSTF found good evidence that screening for AAA and surgical repair of large AAAs (5.5 cm or more) in men aged 65 to 75 who have ever smoked (current and former smokers) leads to decreased AAA-specific mortality. There is good evidence that abdominal ultrasonography, performed in a setting with adequate quality assurance (i.e., in an accredited facility with credentialed technologists), is an accurate screening test for AAA. There is also good evidence of important harms of screening and early treatment, including an increased number of surgeries with associated clinically-significant morbidity and mortality, and short-term psychological harms. Based on the moderate magnitude of net benefit, the USPSTF concluded that the benefits of screening for AAA in men aged 65 to 75 who have ever smoked outweigh the harms.¹²

The recommendations and supporting information contained in this document came from several sources, including the:

- Agency for Healthcare Research and Quality (AHRQ)
• American College of Cardiology
• Harvard Medical School
• Peer-reviewed research
• U.S. Preventive Services Task Force (USPSTF)

The background and supporting information contained in this document is a compilation of research findings. All information presented in this document should be attributed to its referenced source and should not be considered a reflection of other organizations cited in the text.

**Condition/Disease Specific Information**

An abdominal aortic aneurysm (AAA) is a potentially fatal abnormal swelling (often balloon-like) of a segment of the body's largest artery, the aorta. The wall of the artery bulges out rather than remaining straight.1

Abdominal aortic aneurysms are found in 4% to 8% of older men and 0.5% to 1.5% of older women.2-6 Aortic aneurysms account for approximately 15,000 deaths in the United States annually; of these, 9,000 are AAA-related and the remainder are due to thoracic aortic aneurysms.13-14

Once an aortic aneurysm develops, it is a lifelong condition. Most abdominal aortic aneurysms grow larger with time, expanding at an average rate of .33 centimeters to .5 centimeters each year. As many as 1 in 3 AAAs eventually rupture if left untreated.9 In about 20% of cases, an undiscovered abdominal aneurysm ruptures without warning and the patient collapses and dies from massive bleeding inside the abdomen. Most AAAs do not cause any symptoms, however when present, symptoms may include:

- Pain in the abdomen, back, or the fleshy part of sides between the bottom ribs and the hips.
- A feeling of fullness after eating a small meal.
- Nausea and vomiting.
- A pulsating mass in the abdomen.

Older age, smoking, male sex, and family history are the most significant AAA risk factors.7 Other risk factors include high blood pressure, high blood cholesterol levels, and obesity.15 Approximately 69% of men in the United States age 65 to 74 years are current or former smokers and are therefore at risk for AAA.7 A former smoker, also called an “ever smoker” is defined as anyone with a lifetime consumption of more than 100 cigarettes.7
### Value of Prevention

| Economic Burden of Condition/Disease | An estimate of the total societal economic burden of AAA is not available. However, hospital discharge data from Health Cost and Utilization Project (HCUP) show that, in 2003, 45,986 patients were discharged with AAA (without rupture) with a mean length of stay of 6.7 days and aggregate charges of $2.7 billion.\(^\text{10}\) Therefore, the average AAA patient staying in the hospital cost more than $59,000. Hospital discharge data also show that in 2003, 6,815 patients were discharged with a ruptured AAA with a mean length of stay of 10.7 days and total charges of $639.71 million. The average cost per discharge for a ruptured AAA exceeded $93,000. Men accounted for 75% of all discharges and 80% of aggregate charges.\(^\text{10}\)
| Workplace Burden of Condition/Disease | The economic burden of AAA would be much larger if lost productivity, premature mortality, and morbidity costs were accounted for.
| Economic Benefit of Preventive Intervention | Early detection and appropriate management of AAA through screening can prevent costs resulting from rupture or leakage. The average cost of emergency surgery for AAA is approximately $50,000, while elective surgery (following AAA screening) is only $25,000.\(^\text{11}\)
| Estimated Cost of Preventive Intervention | In 2004, the private-sector cost of screening for AAA averaged $115; approximately 95% of all paid claims fell within the range of $35 to $336.\(^\text{16}\)
| Estimated Cost of Treatment | The average cost of surgery for AAA is between $25,000 and $50,000 (in year 2004 dollars).\(^\text{11}\)
| Cost-Effectiveness and/or Cost-Benefit Analysis of Preventive Intervention | The Oregon Evidence-Based Practice Center (EPC) conducted an evidence synthesis of AAA screening studies.\(^\text{17-20}\) Their principal findings point to a cost-effectiveness ratio for population-based AAA screening (compared with no screening) that lies in the range of $14,000 to $20,000 per quality-adjusted life year (QALY).\(^\text{15}\) In comparison to other preventive interventions and to commonly accepted cost-effectiveness benchmarks, screening for AAA is cost-effective.

### Preventive Intervention Information

| Preventive Intervention: Purpose of Screening | Screening for AAA allows clinicians to identify affected patients and those who require preventive surgery and can thereby prevent rupture or leakage of the aneurysm. |
Early intervention reduces AAA-specific mortality and is more cost-effective than emergency surgery.\textsuperscript{11}

### Benefits and Risks of Intervention

Ultrasonography of the abdomen is accurate\textsuperscript{21-22} and reliable\textsuperscript{23} in detecting AAAs and it does not expose patients to radiation. One-time AAA ultrasound screening and the surgical repair of large AAAs (5.5 centimeters or more) in men aged 65 to 75 who have ever smoked reduces AAA-related mortality by as much as 43\%.\textsuperscript{9}

The USPSTF found good evidence of important harms associated with screening and early treatment, including an increased number of surgeries with clinically-significant morbidity and mortality, and short-term psychological harms. Based on the moderate magnitude of net benefit, the USPSTF concluded that the benefits of screening for AAA in men aged 65 to 75 who have ever smoked outweigh the harms.\textsuperscript{12}

### Initiation, Cessation, and Interval of Screening

The USPSTF recommends a one-time screening ultrasound to look for abdominal aortic aneurysm in men aged 65 to 75 who have smoked at any time in their lives. The exact timing of the screen is left to the discretion of the clinician.\textsuperscript{12}

### Intervention Process

Ultrasonography of the abdomen is used to screen for AAA. Ultrasonography should be performed in an accredited facility with credentialled technologists.

### Treatment Information

Treatment depends on the size of the aneurysm. The larger the aneurysm, the more likely it is to burst (rupture). Death rates for ruptured aneurysms and emergency surgery are higher than rates for scheduled repair of unruptured aneurysms. Surgery is almost always recommended for an aneurysm that is leaking. Surgery is generally recommended for people with aneurysms larger than 5.5 centimeters in diameter unless another illness makes surgery unusually risky. Even with no symptoms, a person with an aneurysm larger than 6.5 centimeters would almost always have urgent surgery to repair the problem. People with smaller aneurysms may be monitored with ultrasound tests (every 12 months for anyone with an aneurysm smaller than 3.5 centimeters and every six months for those with aneurysms larger than 3.5 centimeters) to determine if the aneurysm is growing larger.\textsuperscript{1}

Health benefits should include provisions for follow-up and treatment.
Strength of Evidence for the Clinical Preventive Service
The level of evidence supporting the recommendations contained in this chapter is described below.

Evidence-Based Research:
U.S. Preventive Service Task Force (USPSTF)
Strength of Evidence: B (Recommended/At Least Fair Evidence)
• The USPSTF recommends one-time screening for abdominal aortic aneurysm (AAA) by ultrasonography in men aged 65 to 75 who have ever smoked.12

References:

EVIDENCE-STATEMENT: Abdominal Aortic Aneurysm (Screening)


