

## Screening for Abdominal Aortic Aneurysms

By Bill Johnson, RVT, FSVU & Edwin Brockenbrough, MD

In the United States, 15,000 deaths a year are attributed to aneurysms of the aorta, 9,000 of these aneurysms are abdominal aortic aneurysms (AAAs).<sup>1</sup> The incidence appears to be growing, but this is most likely related to the aging of our population and improving diagnostic abilities. The estimated prevalence in patients over 60 years old is 4 to 8 percent. If the AAA ruptures, only 10-25% of patients survive.<sup>2</sup>

If the aneurysm is electively repaired before rupture, there are two approaches, open surgery or endovascular repair. One large study showed morbidity (18% vs 29%) and mortality (1.3% vs. 3.8%) were significantly lower for endovascular repair but concluded the clinical advantages of endovascular repair “are achieved at similarly impressive increases in health care costs.”<sup>3</sup> Long term results of endovascular repair are yet to be determined.<sup>4</sup> Once rupture occurs, 50% or more individuals do not survive to enter the operating room. If they do, emergent AAA repair has an operative mortality rate of 40-48%.<sup>5</sup>

Screening for AAAs has been controversial. Concerns about cost effectiveness, morbidity associated with elective surgery and adverse psychological effects have kept routine screening from being accepted by Medicare and other third party payers.

A recent review, however, concluded; “...population screening for AAA in men age 65 to 74 years appears to reduce deaths from AAA. Treatment is associated with significant risks for operative death and complications. These risks, however, may be acceptable to men with AAAs greater than 5.5 cm, which are most prone to rupture.”<sup>6</sup>

Based on this analysis, the U.S. Preventive Services Task Force (USPSTF) recommends one-time screening for abdominal aortic aneurysm (AAA) by ultrasonography in men age 65 to 75 years who have ever smoked. This is a grade B recommendation.<sup>7</sup>

Congress is currently considering a bill (HR 827) to provide Medicare coverage for AAA screening. The Screening Abdominal Aortic Aneurysms Very Efficiently (SAAAVE) Act (HR 827) is an initiative that would direct Medicare to cover abdominal aortic aneurysm (AAA) screening. The bill was introduced February 16, 2005.<sup>8</sup>

An abdominal aorta with a diameter of greater than 3 cm. is considered aneurysmal. Aneurysms expand by an average rate of 0.3 to 0.4 cm per year and the risk of rupture increases significantly if the diameter is 5 cm. or greater.<sup>9</sup>

The Society of Vascular Surgery and the Society for Vascular Medicine and Biology recommend AAA screening in all men age 60 to 85 years, women age 60 to 85 years with cardiovascular risk factors, and men and women age 50 years and older with a family history of AAA. These groups further recommend the following courses of action after screening: no further testing if aortic diameter is less than 3.0 cm, yearly ultrasonographic screening if aortic diameter is between 3.0 to 4.0 cm, ultrasonography every 6 months if aortic diameter is between 4.0 to 4.5 cm, and referral to a vascular specialist if aortic diameter is greater than 4.5 cm.<sup>10</sup>

The exact cause of the degenerative process that leads to an abdominal aortic aneurysm is unknown, although atherosclerosis has been implicated. Other causes include infection, cystic medial necrosis, arteritis, trauma and connective tissue disorders, but these account for 10% or less of all AAAs.<sup>11</sup>

Significant risk factors include smoking, age, male sex, positive family history, and the presence of a femoral or popliteal artery aneurysm. High blood pressure and elevated serum cholesterol have also been implicated. A history of smoking is associated with a 5-fold increase in AAA risk. 15-25% of patients undergoing AAA repair surgery have a family history of AAA. Most deaths occur in white males over 65 years old.<sup>12</sup>

AAAs may be entirely asymptomatic until rupture. The common presentation before rupture is a pulsatile abdominal mass. Palpating the abdomen has moderate sensitivity in detecting aneurysms greater than 5 cm. in diameter, but cannot be relied on to exclude AAA, especially on obese patients.<sup>13</sup> An incidental finding on an abdominal x-ray may be a calcific outline suggestive of AAA.<sup>14</sup> This finding, evidence of distal embolic events (blue toe syndrome) or a pulsatile abdominal or popliteal mass warrant a diagnostic study. These are indications for further examination and thus are not considered a screening test.

Symptoms of rupture include epigastric or back pain (usually indistinguishable from a general backache) or hypovolemic shock.<sup>15</sup> The general vagueness of symptoms may delay initial diagnosis.

There is an association of AAA and concomitant popliteal aneurysms or femoral, and this occurs approximately 14% of the time.<sup>16</sup> Popliteal aneurysms are frequently bilateral, and of patients with known popliteal aneurysms, 37% also have AAA.<sup>17</sup>

In summary, abdominal aortic aneurysms pose a serious health threat. Ultrasound is a safe and effective method for detecting this

condition in a high risk population. According to the U.S. Preventive Services Task Force; "There is good evidence that abdominal ultrasonography, performed in a setting with adequate quality assurance (that is, in an accredited facility with credentialed technologists), is an accurate screening test for AAA"<sup>18</sup>

Hopefully, pending legislation will soon provide Medicare patients with defined risk factors (male, 65-75 y.o., with any smoking history) coverage for a one time ultrasound screening exam. In the meantime, any patient with a clinical diagnosis of AAA should be examined. If AAA is detected, consideration for elective surgery is recommended for aneurysms with a diameter of 5.5 cm or larger. If less, surveillance with ultrasound is recommended every six months.<sup>19</sup>

Pacific Vascular is a fully accredited vascular lab and we have a follow-up program for AAAs. We can enroll your patient in this program to help you assure routine surveillance recommendations are maintained.

**(Endnotes)**

<sup>1</sup> Deaths: Preliminary Data for 2003. Hoyert DL, Kung H, Smith BL; National Vital Statistics Report. Vol. 53, No. 15  
[http://www.cdc.gov/nchs/data/nvsr/nvsr53/nvsr53\\_15.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr53/nvsr53_15.pdf)

<sup>2</sup> Screening for Abdominal Aortic Aneurysm: A Best-Evidence Systematic Review for the U.S. Preventive Services Task Force. Fleming C; Whitlock EP, Beil TL, Lederle FA; Ann. Intern Med. 2005;142:203-211

<sup>3</sup> Perioperative outcomes after open and endovascular repair of intact abdominal aortic aneurysms in the United States during 2001. Lee WA, Carter JW, Upchurch G, et al; J Vasc Surg. 2004 Mar;39(3):491-6.

<sup>4</sup> Endovascular treatment of abdominal aortic aneurysms. Towne JB. Am J Surg. 2005 Feb;189(2):140-9.

<sup>5</sup> A meta-analysis of 50 years of ruptured abdominal aortic aneurysm repair. Bown MJ, Sutton AJ, Bell PR, Sayers RD; Br J Surg. 2002;89:714-30

<sup>6</sup> Screening for Abdominal Aortic Aneurysm: A Best-Evidence Systematic Review for the U.S. Preventive Services Task Force. Fleming C, Whitlock EP, Beil TL, Lederle FA; Ann Int Med 2005 Feb;142(3):203-211

<sup>7</sup> Screening for Abdominal Aortic Aneurysm: Recommendation Statement. U.S. Preventive Services Task Force Ann Int Med 2005 Feb;142(3): 198-202

<sup>8</sup> <http://dodd.senate.gov/press/Releases/05/0216.htm>  
[http://www.house.gov/apps/list/press/ky02\\_lewis/SAAAVE.html](http://www.house.gov/apps/list/press/ky02_lewis/SAAAVE.html)  
<http://thomas.loc.gov/cgi-bin/query/z?c109:H.R.827>

<sup>9</sup> The natural history of abdominal aortic aneurysms. Guirguis EM, Barber GG; Am J Surg. 1991 Nov;162(5):481-3.

<sup>10</sup> Screening for abdominal aortic aneurysm: a consensus statement. Kent KC, Zwolak RM, Jaff MR, et al; J Vasc Surg . 2004;39:267-9.

<sup>11</sup> The aneurysm detection and management study screening program: validation cohort and final results. Lederle FA, Johnson GR, Wilson SE, et al. Arch Intern Med. 2005;142:203-211

<sup>12</sup> Smokers' relative risk for aortic aneurysm compared with other smoking-related diseases: a systematic review. Lederle FA, Nelson DB, Joseph AM; J Vasc Surg. 2003;38:329-34.

<sup>13</sup> The Accuracy of Physical Examination to Detect Abdominal Aortic Aneurysm. Fink HA, Lederle FA, Roth CS, et al; Arch Intern Med. 2000;160:833-836

<sup>14</sup> The rational clinical examination. Does this patient have abdominal aortic aneurysm? Lederle FA, Simel DL; JAMA. 1999 Jan 6;281(1):77-82.

<sup>15</sup> The Merck Manual of Geriatrics, Sec. 11, Ch. 95 Aneurysms. Beers M, Berkow R, Editors; Internet Edition 2000.  
[http://www.merck.com/mrkshared/mm\\_geriatrics/home.jsp](http://www.merck.com/mrkshared/mm_geriatrics/home.jsp)

<sup>16</sup> Incidence of femoral and popliteal artery aneurysms in patients with abdominal aortic aneurysms. Diwan A, Sarkar R, Stanley JC, et al; J Vasc Surg. 2000 May;31(5):863-9.

<sup>17</sup> Atherosclerotic popliteal aneurysm. Dawson I, Sie RB, van Bockel JH. Br J Surg. 1997 Mar; 84(3):293-9.

<sup>18</sup> Screening for Abdominal Aortic Aneurysm: Recommendation Statement. U.S. Preventive Services Task Force. Ann Int Med 2005.142: 198-202.

<sup>19</sup> Immediate repair compared with surveillance of small abdominal aortic aneurysms. Lederle FA, Wilson SE, Johnson GR, et al. N Engl J Med 2002;346. (19):1437-4\_4.

Vascular Diagnostics is published by Pacific Vascular, Inc. Lynette Faye - editor; Keith Fujioka, RVT, FSVU - Technical Advisor; Edwin Brockenbrough, MD - Medical Director; Keith Fujioka, RVT, FSVU - President and CEO. Pacific Vascular operates noninvasive vascular laboratories throughout the Puget Sound area. For more information or for patient scheduling, please call (425) 486-8868 or 1-800-282-6516 (in WA). Visit our web site at <http://www.pacificvascular.com>. Reprints are available upon request.

- Yakima Valley Vascular Lab
- Yakima**
- Jefferson Healthcare Hospital
- Port Townsend**
- Valley Medical Center
- St. Francis Hospital, Federal Way
- St. Clare Hospital, Tacoma
- Enumclaw Medical Center
- Auburn Regional Medical Center
- South Locations**

- Evergreen Place, Kirkland
- East Location**
- Nordstrom Medical Tower
- Jefferson Square, West Seattle
- Swedish Medical Center/Providence
- Swedish Medical Center/Ballard
- Central Locations**
- Stevens Hospital
- Northwest Hospital
- North Locations**

[www.pacificvascular.com](http://www.pacificvascular.com)  
 (425) 486-8868  
 Bothell, WA 98011  
 18702 N. Creek Pkwy, Ste 212



Vicky will  
add the  
permit here.