AAA Screening: How Can the Challenge Be Effectively and Efficiently Met?

The President of the German Society of Vascular Surgery and Vascular Medicine discusses Germany's nationwide AAA screening program, the challenges and potential drawbacks to screening, and the use of monitoring devices in aortic health.

WITH DITTMAR BÖCKLER, MD, PHD

A nationwide abdominal aortic aneurysm (AAA) screening program now exists in Germany. What does this program entail and include, and by what means are patients screened?

It took about 9 years to persuade German authorities and regulatory bodies that establishing a screening program was an important endeavor, and a nationwide screening program was finally established in Germany on June 10, 2017. The German Society of Vascular Surgery and Vascular Medicine initially compiled the evidence of well-known published randomized trials and based the screening program on other established successful screening programs in the United States, United Kingdom, and Sweden. As a result, all men > 65 years qualify for a one-time ultrasound-based screening examination for AAA.

What was the process by which the program was designed and implemented on a national level?

In 2008, the German Society of Vascular Surgery and Vascular Medicine brought this topic to public attention. In April 2013, a consultancy process was initiated by the Federal Ministry of Health. The process was then undertaken by the Federal Joint Committee, which is the highest decision-making body of the joint self-government of physicians, dentists, hospitals, and health insurance funds in Germany. In November 2013, the Institute for Quality and Efficiency in Health Care, an independent scientific institute for quality control in public health, assessed AAA screening with ultrasound to be effective and safe. Three years later, in October 2016, a first draft of a guideline (also called a *directive*) was published and finalized.

These directives established by the Federal Joint Committee have the same level of recommendation as guidelines. An evaluation of the screening program is planned for 3 years after initiation to analyze the evolution of elective AAA repair, mortality rates, and expected reduction of aneurysm rupture and associated death.

Do you believe that the current program is optimal, or would you suggest any changes to the population inclusion parameters or screening methods?

Vascular surgeons in Germany are happy that this screening program has been established. Now, it's important to keep it running and get renewal after evaluation. Of course, I would prefer that the recommendations be revised such that they are more detailed and specific (see the *Proposed Additional Recommendations to the German AAA Screening Program* sidebar). Family screening is one topic I would like to highlight and is a question often asked by my patients. I would like to intensify the integration of

neighboring disciplines such as urology, which sees the same patient cohort at risk—elderly men. I also would like to include the recommendation, as the most recent European Society for Vascular Surgery (ESVS) guidelines have recommended, for patients to see a vascular surgeon for further evaluation and treatment after AAA detection. A standardized measurement protocol should be described in more detail. The anteroposterior measuring plane with consistent caliper placement should be considered the preferred method for assessing abdominal aortic diameter on ultrasonography.

How do the most recent ESVS guidelines suggest AAA screening be administered?

Recommendation 12 of the ESVS guidelines represent level I, class A evidence and indicates population screening for AAA with a single ultrasound scan for all men who are 65 years of age. This is 100% in line with the German directive of the Federal Joint Committee.

What are the biggest challenges to effective and efficient screening?

In short, the biggest challenge is awareness among patients but also among general practitioners. We need standardized examination, prompt referral, and allocation to high-quality treatment, which then means low complication, readmission, and reintervention rates.

Another challenge often discussed among vascular surgeons is a strong call for external, independent quality control of invasive (open and endovascular) AAA care. As a consequence, centralization with 24/7 service is demanded, especially in open aortic surgery. Infrastructure with intensive care units, trained staff and nursing, and dialysis are needed.

What are the potential drawbacks of population-based screening programs?

The principal harms of screening are associated with an increased rate of elective AAA repair and its associated morbidity and mortality, which therefore affects quality of life. The number of elective repairs increased approximately twofold in those invited for screening, although this is partially offset by the reduction of emergency AAA repairs. This is well reported in the literature. The high mortality associated with rupture combined with low elective perioperative risk results in a number needed to screen of 667 and number needed to treat with AAA repair of 1.5 in order to prevent one premature AAA-related death.

But, at this point, another challenge arises, that of centralization with better 24/7 infrastructure, and the potential effects of volume on outcomes observed in high-volume centers. This is an ongoing and intense discussion in Germany among vascular surgeons, and it must be addressed. Otherwise, authorities who are not always experts in the field will decide alone.

Furthermore, quality of life has been assessed using generic questionnaires, and the diagnosis of AAA appears to be associated with a transient small reduction in quality of life, with recovery by 12 months. More recent studies and systematic reviews suggest that both the physical and psychological harms of AAA are significant. I am curious to know if further research will validate these conclusions.

How would you summarize the current lessons from the data regarding the effectiveness of national screening programs?

At this time, we are not able to draw conclusions or talk about lessons learned. The effectiveness of the screening program is currently under evaluation. We expect results by 2020.

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PROPOSED ADDITIONAL RECOMMENDATIONS TO THE GERMAN AAA SCREENING PROGRAM

- Single screening ultrasound for men > 65 years
- Single screening ultrasound for individuals with a family history of AAA
- Single screening ultrasound for women > 65 years, a history of smoking, and those with a positive family history of AAA
- Diameter < 3 cm: No further screening required
- Diameter 3–4 cm: Annual ultrasound
- Diameter 4–4.5 cm: Ultrasound at 6 months
- Diameter > 4.5 cm: CT scan and referral to vascular surgery
- Diameter 5–5.5 cm in men: Indication for invasive treatment
- Diameter > 4.5 cm in women: Consider treatment selectively

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What makes studying the utility, efficacy, and cost-effectiveness of screening programs challenging?

As previously mentioned, in Germany, the access to data and the capability for us to analyze them are challenging. We are still at the initial stages of the program (3 years after kickoff), and we expect the first evaluation next year. Another challenge is the different reimbursement of AAA screening between countries. In Germany, €6.07 is provided for AAA screening, and after treatment, a certain reimbursement based on diagnosis-related group is paid by the patient's insurance company independent from outcome quality.

How have screening capabilities evolved in recent years?

The use of ultrasound is widespread and frequently used in medical practices in Germany. Facilities now have sufficient capabilities for screening for AAA. It is all about the information available to practitioners, correct selective use of the AAA screening program, patient education, and referral to vascular surgery for surveillance and treatment if AAA is diagnosed.

What do you envision as the potential applicability of personal monitoring devices, such as app-based and wearable technologies, for collecting and transmitting data regarding aortic health?

Personal monitoring devices are available and already in use. A wireless, passive sensor for monitoring the pressure of an AAA sac has been available for more than 10 years but for many reasons has not become standard. Implantation of monitoring devices comes with many disadvantages, and the battery life is substandard. Personally, I see increased use of free online video training and ultrasound with smartphones. Smartphones will play an important role in the future for preventive medicine overall. Apps and artificial intelligence will change our lives and will be very helpful but will not replace physicians and surgeons. ■

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