

# Review: Population-based screening for abdominal aortic aneurysm reduces cause-specific mortality in older men

Fleming C, Whitlock EP, Beil TL, Lederle FA. Screening for abdominal aortic aneurysm: a best-evidence systematic review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2005;142:203-11.

**Clinical impact ratings:** GIM/FP/GP ★★★★★☆ Geriatrics ★★★★★☆

## QUESTION

What is the effectiveness of population-based screening for abdominal aortic aneurysm (AAA)?

## METHODS

**Data sources:** MEDLINE (1994 to July 2004), the Cochrane Database of Systematic Reviews (Issue 1, 2004), the Cochrane Controlled Trials Register (January 1994 to May 2004), bibliographies of relevant studies, hand-searching relevant journals, and contacting experts.

**Study selection and assessment:** Randomized controlled trials (RCTs) of population-based screening for AAA. Studies were assessed for quality using predefined criteria, including study design and power.

**Outcomes:** AAA-related mortality and all-cause mortality.

## MAIN RESULTS

4 RCTs (2 from the United Kingdom, 1 from Denmark, and 1 from western Australia) of

population-based screening for AAA in 125 595 men  $\geq 65$  years of age were included. Meta-analysis showed that an invitation to attend AAA screening and a strategy of operating for a diameter  $> 5$  cm compared with usual care (passive follow-up without contact) reduced AAA-related mortality (4 RCTs), but not all-cause mortality (3 RCTs) (Table). 1 RCT (done in the United Kingdom) in 9342 women 65 to 80 years of age showed no reduction in AAA-related mortality or all-cause mortality with population-based AAA screening at 5-year follow-up.

## CONCLUSION

In men  $\geq 65$  years of age who are suitable for elective abdominal aortic aneurysm (AAA) repair, an invitation to attend AAA screening and a strategy of operating for a diameter  $> 5$  cm reduces AAA-related mortality but not all-cause mortality.

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### Invitation to attend abdominal aortic aneurysm (AAA) screening vs usual care in men $\geq 65$ years of age at mean 4 to 5 years\*

Outcomes	Number of studies (n)	Weighted event rates		RRR	NNT (CI) (95% CI)
		Invitation to attend AAA screening	Usual care		
AAA-related mortality	4 (125 595)	0.16%	0.28%	43% (26 to 55)	851 (492 to 3167)
All-cause mortality	3 (112 937)	11.1%	11.3%	2% (-2 to 5)	Not significant

\*Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article using a random-effects model.

## COMMENTARY

The review by Fleming and colleagues shows that ultrasound screening for AAA is safe and reduces cause-specific mortality. However, physicians should carefully consider the conditions under which this screening is effective. The results are only applicable to men deemed fit for surgery. In addition, in an older population comorbid conditions compete for cause of death and affect both the results of surgery (increasing mortality) and the benefit of screening (reducing life expectancy secondary to non-AAA causes). The RCTs that showed greater benefit excluded patients  $> 74$  years of age.

With the caveats described, screening potentially prevents 1 AAA-related death per 1000 patients per year. An estimated 18 million men  $> 65$  years of age reside in the United States (1). In the review by Fleming and colleagues, the AAA-related mortality was 0.056% per year (i.e., if this rate were applied to the United States, 10 000 patients/y would die because of rupture). Assuming that only 50% are eligible for screening with a relative risk reduction of 43% (95% CI 26 to 55), a program of screening would prevent 1300 to 2750 AAA-related deaths per year. This large reduction in mortality, however, requires that 9 million men are screened and 81 000 have surgery. From an individual patient perspective, surgery carries a substantial risk for mortality and morbidity. The low perioperative mortality associated with endovascular AAA repair is promising, but long-term results are still needed. From a

societal perspective, the intervention is resource-intensive. 2 RCTs (2, 3) addressed the cost-effectiveness of AAA screening and suggest that it is within the acceptable margin of other similar public health measures. The cost-effectiveness ratio improves with accumulating life-years gained by those in whom death was prevented by the intervention.

With these considerations in mind, screening for AAA is advisable in men 65 to 75 years of age who are suitable candidates for surgery and who would have surgery if they were found to have an AAA  $> 5$  cm.

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## References

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