

Screening for abdominal aortic aneurysm (AAA) in older men reduced AAA mortality at 13 years

Thompson SG, Ashton HA, Gao L, Buxton MJ, Scott RA. *Final follow-up of the Multicentre Aneurysm Screening Study (MASS) randomized trial of abdominal aortic aneurysm screening.* *Br J Surg.* 2012;99:1649-56.

Clinical impact ratings: **GM** ★★★★★☆☆ **C** ★★★★★☆☆ **G** ★★★★★☆☆

Question

What is the long-term effectiveness of screening for abdominal aortic aneurysm (AAA) in men 65 to 74 years of age?

Methods

Design: Randomized controlled trial (Multicentre Aneurysm Screening Study [MASS]). Current Controlled Trials ISRCTN37381646.

Allocation: Concealed.*

Blinding: Unblinded.*

Follow-up period: Mean 13 years.

Setting: 4 centers in the UK.

Participants: Population-based sample of 67 770 men 65 to 74 years of age (mean age 69 y).

Intervention: Invitation to ultrasound screening ($n = 33\ 883$) or no invitation ($n = 33\ 887$). Men with AAA (aortic diameter > 3 cm) began surveillance and had repeated imaging every 3 months (aortic diameter 4.5 to 5.4 cm) or annually (aortic diameter 3.0 to 4.4 cm). Men were referred for elective surgery for aneurysms ≥ 5.5 cm, aortic expansion > 1.0 cm/y, or symptoms.

Outcomes: Primary outcome was AAA-related mortality (death within 30 d of any emergency or elective AAA surgery, or death with AAA at specified or unspecified site, with or without mention of rupture). Other outcomes included all-cause mortality.

Patient follow-up: 97% for mortality.

Main results

27 204 men (80%) in the invitation group attended screening, and 1334 AAAs were detected. AAA-related mortality and all-cause mortality were lower in the invitation group than in the no-invitation group (Table). Invitation to screening reduced AAA-related mortality by an absolute difference of approximately 5 in 1000.

Conclusion

Screening for abdominal aortic aneurysm (AAA) in men 65 to 74 years of age reduced AAA-related mortality at 13 years of follow-up.

*See Glossary.

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Commentary

Consistent with previous studies (1), the results of the study by Thompson and colleagues suggest that 1-time screening for AAA by ultrasound in men aged 65 to 75 years reduces AAA-related mortality. However, the magnitude of the effect is very small, with an absolute reduction in the likelihood of death from aneurysm of 5 in 1000 over 13 years, meaning that > 200 men would need to be screened to prevent 1 additional aneurysm-related death over a 13-year period.

The study raises concerns about men with a baseline aortic diameter below the threshold for rescreening who experienced a steady increase in AAA rupture after year 8, 80% of which were fatal. Of these, 56% with available baseline scans had subaneurysmal aorta (2.5 to 2.9 cm). No model has examined the additional benefit of rescreening this group of patients. The study suggests that rescreening patients with aortas 2.5 to 2.9 cm in diameter—possibly 5 years after an initial scan—could result in another small reduction in aneurysm-related mortality.

The magnitude of effect, while very small, is not much smaller than the best estimates of the benefit of breast and colon cancer screening, which have been largely endorsed in North America. Society might be interested in the resources required to achieve the small benefit. The MASS investigators concluded that screening is cost-effective over time (2). Estimates based on 10-year follow-up showed an incremental cost-effectiveness ratio of £7600 per life-year gained. The study, however, used optimistic assumptions, which may have overestimated the cost effectiveness.

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References

1. Cosford PA, Leng GC. Screening for abdominal aortic aneurysm. *Cochrane Database Syst Rev.* 2007;2:CD002945.
2. Thompson SG, Ashton HA, Gao L, Scott RA; Multicentre Aneurysm Screening Study Group. Screening men for abdominal aortic aneurysm: 10 year mortality and cost effectiveness results from the randomised Multicentre Aneurysm Screening Study. *BMJ.* 2009;338:b2307.

Invitation to screening for abdominal aortic aneurysm (AAA) vs no invitation†

Outcomes	Event rate/1000 person-y		At a mean 13 y	
	Invitation	No invitation	RRR (95% CI)	NNS (CI)
AAA-related mortality‡	0.63	1.09	42% (31 to 51)	213 (175 to 289)
All-cause mortality	39.2	40.3	3% (1 to 5)	106 (63 to 317)

†NNS = number needed to screen; other abbreviations defined in Glossary. NNS and CI calculated from control event rates and hazard ratios in article.

‡Death within 30 days of emergency or elective AAA surgery, or death with AAA at specified or unspecified site, with or without mention of rupture.