

INVITED COMMENTARY

To Keep Watching or Let It Go: Can We Achieve an Optimal Trade Off Between Costs and Effectiveness for Post-EVAR Follow Up?

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Lifelong imaging follow up after endovascular abdominal aortic aneurysm repair (EVAR) has been traditionally endorsed but may have unclear benefits, especially in patients with satisfactory early results and low risk aortic morphology.^{1,2} Therefore, it is reasonable to try and estimate the financial impact of discontinuing yearly surveillance in patients who may be at low risk of late failure. Geraedts *et al.*³ evaluated the cost of follow up after EVAR in patients with an initial post-operative computed tomography angiogram (CTA) without any abnormalities, using a multicentre dataset from The Netherlands (the ODYSSEUS study), aiming to assess differences in outcomes in those with continued or discontinued yearly surveillance after the intervention. They performed an incremental cost analysis and budget impact analysis of de-implementation of yearly imaging following EVAR. In total, 1 596 patients were included, and the expected cost savings were assessed if yearly imaging was eliminated in patients with a post-operative CTA without abnormalities made around 30 days after EVAR. A 24% reduction in cost was estimated for patients with discontinued imaging follow up. The cost per patient was €1 935 in the continued group vs. €1 603 per patient in the discontinued group at five years post-EVAR with a mean difference of €332. They calculated that de-implementation of yearly imaging would result in an overall nationwide cost saving of €678 471.

Notwithstanding the relevance and originality of this study that may shed further light on longitudinal cost assessment following EVAR and can serve as a useful reference for future works in the field, there are some limitations inherent with its design that should be addressed in order to put the study findings into the appropriate clinical perspective.

Geraedts *et al.* state that the study was performed from a societal perspective and therefore added cost related to travel and parking to the economic model. However, there exist other societal costs (such as time off work for either patients or care givers) that were not assessed, which may have led to underestimation of total expenses. Another limitation to

address was the definition of discontinued imaging follow up (in the ODYSSEUS study, not undergoing yearly imaging for 16 months and or missing one scheduled examination). This relatively wide definition does not include the reasons for discontinuation and could have led to further underestimation of costs that, coupled with the observation that patients were included until 2012 (i.e., a decade ago, with possible time related effects not taken into consideration), may impact conclusions and limit generalisability. Since cost data and clinical events were collected only if patients returned to the participating hospitals, it remains possible that some patients were followed up at a non-participating institution or underwent imaging surveillance elsewhere, possibly introducing attrition bias in the study design.

Also, only costs related to de-implementation of yearly imaging were assessed, but no measures of effectiveness (e.g., quality adjusted life years) were analysed. As such, no statements could be made regarding the actual cost effectiveness of yearly follow up in the setting of a normal CTA after EVAR. In that sense, given that the net saving at an individual level was only modest and no cost effectiveness was formally demonstrated, it may be wiser to maintain current surveillance strategies until further evidence can be made available. Furthermore, cost effectiveness of new policies and or interventions needs to be evaluated in relation to the willingness to pay threshold or incremental cost effectiveness ratio,⁴ which may vary by country and over time, possibly further reducing the generalisability of study findings.

Lastly, although all patients included in the study had normal post-operative CTA scanning, this by itself will not exclude future failures of their EVAR in all cases and should not be interpreted as discharging patients for life. In fact, it is well acknowledged that some high risk morphological features remain strongly predictive of late complications even if the first post-operative CTA scan looked innocent, as also reflected in the European Society for Vascular Surgery guidelines.⁵ In that sense, most clinicians could be inclined to discontinue yearly

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follow up if both the above criteria are met (i.e., normal post-operative CTA scan and absence of high risk morphological features). However, whether this could be immediately translated to patients in whom only one of these instances is met remains to be proven, at least for the long term (since results were truncated at five years, no conclusions beyond this time should be extrapolated). Future studies are awaited to confirm the observations by Geraedts *et al.* and enable cross comparison of cost effectiveness between different models of care in European and non-European countries.

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REFERENCES

- 1 Geraedts ACM, Mulay S, Vahl AC, Verhagen HJM, Wisselink W, de Mik SML, et al, ODYSSEUS study group. Editor’s Choice – Post-operative surveillance and long term outcome after endovascular aortic aneurysm repair in patients with an initial post-operative computed tomography angiogram without abnormalities: the multicentre retrospective ODYSSEUS study. *Eur J Vasc Endovasc Surg* 2022;**63**:390–9.
- 2 Bastos Gonçalves F, van de Luijngaarden KM, Hoeks SE, Hendriks JM, ten Raa S, Rouwet EV, et al. Adequate seal and no endoleak on the first postoperative computed tomography angiography as criteria for no additional imaging up to 5 years after endovascular aneurysm repair. *J Vasc Surg* 2013;**57**:1503–11.
- 3 Geraedts ACM, van Dieren S, Mulay S, Vahl AC, Koelemay MJW, Balm R, ODYSSEUS study group. Cost of follow up after endovascular abdominal aortic aneurysm repair in patients with an initial post-operative computed tomography angiography without abnormalities. *Eur J Vasc Endovasc Surg* 2022;**64**:602–8.
- 4 D’Oria M, Wanhainen A, DeMartino R, et al. A scoping review of the rationale and evidence for cost-effectiveness analysis of fenestrated-branched endovascular repair for intact complex aortic aneurysms. *J Vasc Surg* 2020;**72**:1772–82.
- 5 Wanhainen A, Verzini F, Van Herzele I, et al. Editor’s Choice – European Society for Vascular Surgery (ESVS) 2019 clinical practice guidelines on the management of abdominal aorto-iliac artery aneurysms. *Eur J Vasc Endovasc Surg* 2019;**57**:8–93.