Introduction: It is possible that the postoperative mortality following AAA surgery has changed due to the increased application of endovascular aneurysm repair (EVAR) at the expense of open surgical repair (OSR), along with the preference of a hospital. The aim of this study was to investigate the effect of the relative hospital preference for EVAR on mortality after EVAR and OSR and current risk difference (RD) of postoperative mortality between EVAR and OSR in a large consecutive cohort by using an instrumental variable (IV) analysis.

Methods: Patients with a primary elective infra- or juxtarenal aneurysm (EAAA) repair registered in the Dutch Surgical Aneurysm Audit (DSAA) between 2013 and 2017 were analysed. Mortality rates in hospitals with a higher preference for EVAR were compared with hospitals with a lower preference: high-%EVAR versus low%EVAR hospitals, divided by the median percentage of EVAR performed. The RD between patients undergoing EVAR and OSR was determined in 4 ways: unadjusted linear regression analysis, adjusted linear regression analysis with observed confounders, propensity score (PS) analysis adjusting for observed confounders and IV analysis (Two-Stage Least Square Regression), adjusting for unobserved confounders, using the variation in percentage of EVAR per hospital performed as the IV instrument.

Results: 11,997 EAAA patients were analysed. The overall RD on mortality between high-% and low%EVAR hospitals was 0.1% (95% CI 0.5-0.4). Mortality after OSR was significantly higher in high%EVAR hospitals compared to low%EVAR hospitals: 7.3% versus 4.0% (RD 3.3%; 95%CI 4.1-5.3). After EVAR mortality was resp. 0.9% versus 0.7% (RD 0.2%; 95%CI 0.02-0.6). The unadjusted RD between EVAR and OSR was 4.2% (95%CI 3.7-4.8) in favour of EVAR. The adjusted RD for observed confounders was 4.4% (95%CI 3.8-5.0). The RD following PS-analysis was 4.7% (95%CI 4.1-5.3). IV-analysis showed a non-significant RD between EVAR and OSR of 1.3 (95%CI 0.9-3.6).

Conclusion: Overall, in high-% and low%EVAR hospitals mortality was not significantly different. When adjusted for observed confounders by multivariate analysis patients with EVAR had a significantly lower postoperative mortality compared to patients with OSR. However, the RD was low and non-significant following IV-analysis. High-% versus low-% EVAR hospitals had a significantly higher postoperative mortality following OSR.

Disclosure: Nothing to disclose

O-002 Hospital Volume Effects on Abdominal Aortic Aneurysm Repair Mortality — An International Registry-based Analysis

Abdominal Aortic Diseases

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Introduction: The influence of hospital volume on early mortality after abdominal aortic aneurysm (AAA) repair of intact and ruptured AAA internationally is poorly
understood. The purpose of this study was to assess the impact of hospital volume on early mortality after endovascular aneurysm repair (EVAR) and open aneurysm repair (OAR) using worldwide data.

**Methods:** Vascular registry data on AAA repair was obtained from 11 countries 2010-2016 in an international transatlantic registry collaboration involving data from Europe, North America and Australasia. Postoperative mortality was compared among four study cohorts [EVAR and OAR for intact AAA (iAAA) and ruptured AAA (rAAA)]. Hospitals from all countries were grouped into quartiles based upon aggregated annualized aortic case volume for OAR and EVAR. The effect of volume on outcome after adjustment for patient age, sex, and medical risk factors was assessed in a hierarchical logistic regression model.

**Results:** Among 178,302 patients (mean age:73±8 years; female:15%), 87% were treated for iAAA and 13% for rAAA. EVAR was used in 63% of patients [iAAA:68%; rAAA:28%]. Median individual hospital annual volumes varied between countries, EVAR 7.0-76.4, OAR 4.0-85.6 cases per year. Overall postoperative mortality was: EVAR, iAAA 1.0%, rAAA 23.0%; OAR, iAAA 4.7%, rAAA 37.2%. In crude and risk-adjusted analysis, no hospital volume effect on mortality was identified after EVAR for iAAA or rAAA. However, a significant mortality reduction was detected in the highest volume quartile for OAR (iAAA, odds ratio Q4 vs. Q1, 0.55;p=.007; rAAA, Q4 vs. Q1, 0.44;p<.001). During the study period, EVAR utilization increased for both iAAA (from 65 to 72%) and rAAA repair (from 24 to 34%). Mean hospital OAR volume decreased from 35.7 in 2010-2013 to 29.8 in 2014-2016 (p< 0.001).

**Conclusion:** Higher volume hospitals have significantly lower postoperative mortality after OAR for both iAAA and rAAA. Notably, OAR volumes are decreasing due to the increased utilization of EVAR. These results suggest that patients needing OAR should be referred to high volume centers if possible, while similar EVAR outcomes can be anticipated independent of hospital volume. These findings have significant implications on physician training, hospital accreditation, and care regionalization internationally to further improve AAA outcomes.

**Disclosure:** Nothing to disclose

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**O-003 Safety of Patient Stratification Based on Initial Imaging Follow-up After Endovascular Aneurysm Repair (EVAR)**

**Abdominal-Aortic Diseases**

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**Introduction:** Most patients undergo uneventful long-term follow-up after EVAR. Therefore, unmodified surveillance protocols may be ineffective. Recently, modified follow-up protocol was suggested by the European Society for Vascular Surgery (ESVS). One feature of this protocol is that for patients without any detectable complication at one month or at one year, the next scheduled follow-up could be carried out at five years. In this study, we analysed the safety of this protocol retrospectively by evaluating the fate of the patients if they had been followed according to the introduced protocol.

**Methods:** Between 2005 and 2013, 346 patients were treated electively for abdominal aortic aneurysm (AAA) in an academic center. Indication for treatment was an AAA ≥5.5cm in men and ≥5.0cm in women or growth (≥5mm) during the previous six months. Patients were treated with three different stent-grafts: Zenith by Cook, Excluder by Gore and Endurant by Medtronic. All patients were annually followed according to prearranged program including CTA at 1 and 24 months and CDUS annually. Available control images until the end of 2018 were retrospectively analysed for the study.

**Results:** The mean follow-up was 68 months (range, 0–153 months) and overall survival was 93.4%, 84.1%, 65.0%, 21.4% at 1, 2, 5 and 10 years. 30-day mortality was 1.2% (n=4). Imaging data for those surviving the first 30 days was available for 98.8% (n=338) subjects. At one-month control exam 82.0% (n=277) patients had no detectable endoleak. Of those patients 11.1% (n=31) developed re-intervention requiring graft-related complication during the next five years (Figure 1). Among these incidents were four RAAAs. Among those with an endoleak type 2 at one month (n=56), six had sac shrinkage at one year, CDUS and therefore the next surveillance control would have been at five years. Four out of these six patients developed re-intervention requiring graft-related complication between 1 and 5 years, including one RAAA (Figure 2). Complications requiring treatment that would have been missed by following the suggested protocol included: endoleak type 1A (n=9), endoleak type 1B (n=7), endoleak type II (n=19), thrombosis (n=4), and RAAA (n=5). In general 22.0% (n=76) of the patients had re-intervention requiring complication and 80.0% (n=61) of them were treated during the first five years after EVAR. The sensitivity and specificity of one-month CTA to detect potential significant complications during the first five years were 47.5% (95% CI 32.3–60.9%) and 88.2% (95% CI 83.8–91.7%) respectively.

**Disclosure:** Nothing to disclose

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**Figure 1.** Adjusted odds ratio for post-operative mortality after AAA repair based on hospital volume.