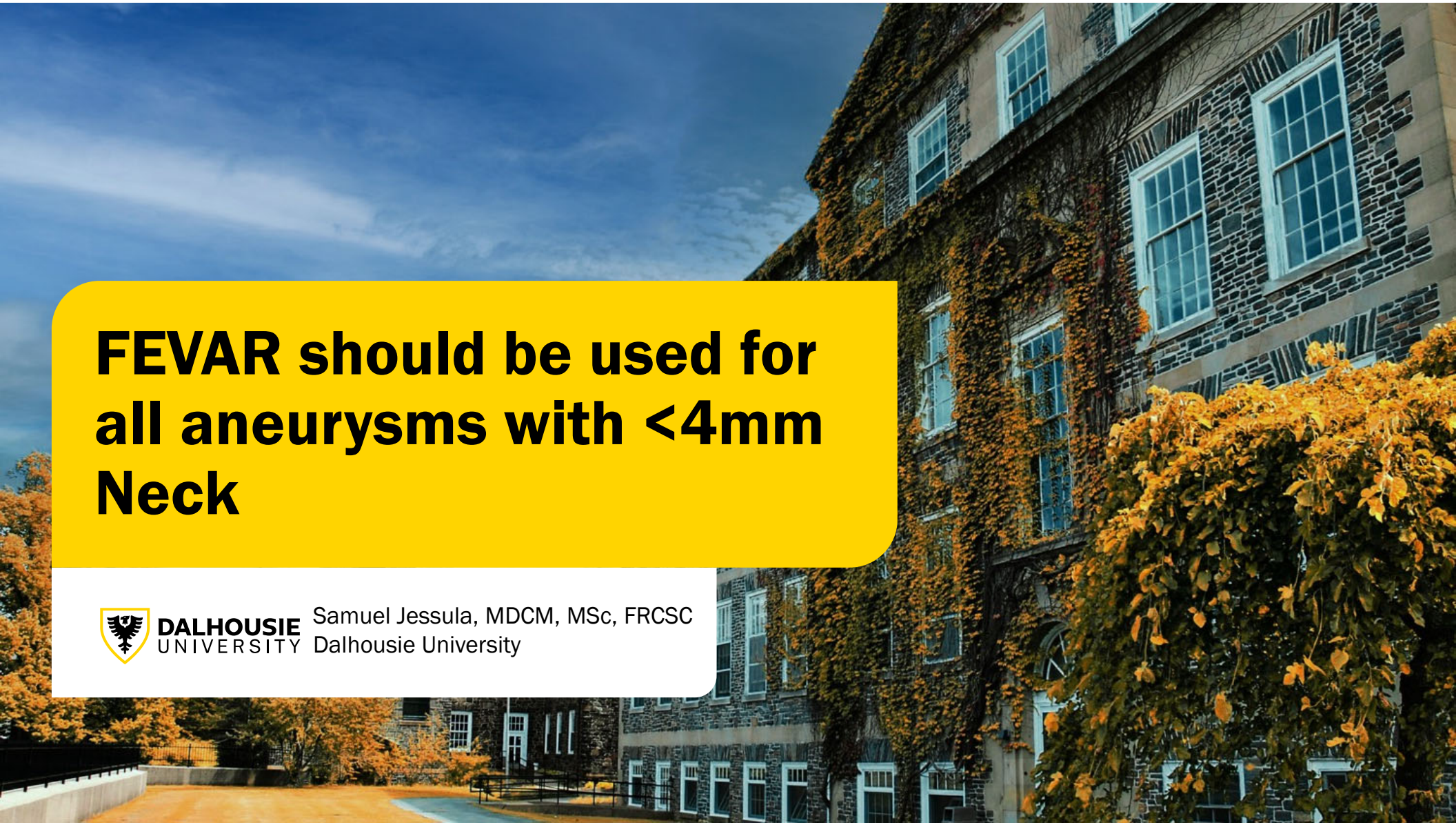


FEVAR should be used for all aneurysms with <4mm Neck

DALHOUSIE UNIVERSITY
Samuel Jessula, MDCM, MSc, FRCSC
Dalhousie University

Outline

- What I'm not going to discuss:
  - Ruptured/urgent aneurysm repair
  - AAA repair in young/connective tissue patients
  - Infected/mycotic aneurysms
  - Unfit for open surgery
  - Chimney/fancy EVAR

- What I am going to discuss:
  - FEVAR vs open for short neck in patients equivocal for open and endo

Disclosures

I have no disclosures.

Mortality

Editor's Choice – Comparison of Open, Standard, and Complex Endovascular Aortic Repair Treatments for Juxtarenal/Short Neck Aneurysms: A Systematic Review and Network Meta-Analysis

Shaneel R. Patel [a,b,c,*], David C. Ormesher [a], Rebecca Griffin [d], Richard J. Jackson [d], Gregory Y.H. Lip [b], Srinivasa R. Vallabhaneni [a,b], on behalf of the UK-COMPASS Trial

Eur J Vasc Endovasc Surg (2022) 63, 696—706

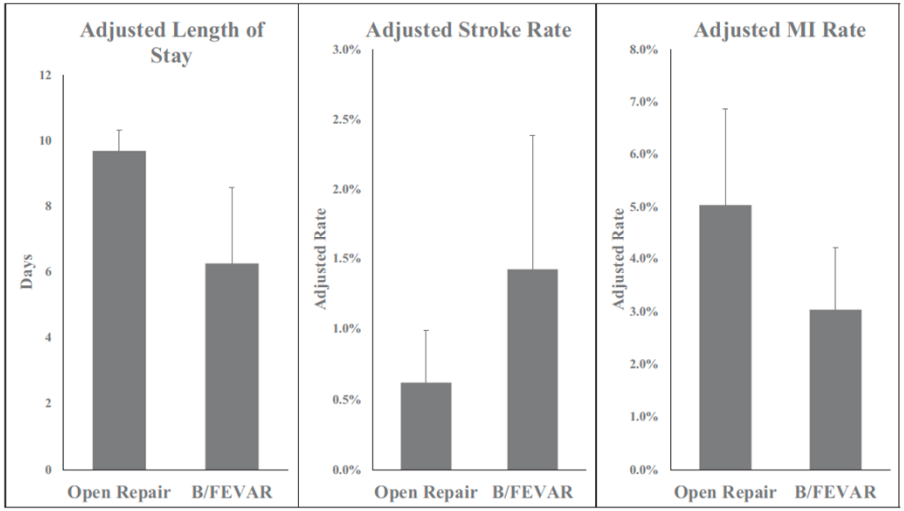
Figure 4. Forest plots for comparative all cause mortality network meta-analysis (A) peri-operatively (7 804 patients across 22 studies; open surgery 5 366 patients, FEVAR 1 654 patients, ChEVAR 418 patients, and EVAR off IFU 366 patients) and (B) at midterm follow up (3 481 patients across 16 studies; open surgery 2 266 patients, FEVAR 699 patients, ChEVAR 224 patients, and EVAR off IFU 292 patients) in studies providing comparative outcomes between methods of complex abdominal aortic aneurysm repair. Error bars represent 95% confidence intervals. Mean midterm follow up was 30.63 months. FEVAR = fenestrated endovascular aneurysm repair; EVAR off IFU = endovascular aneurysm repair off instructions for use; ChEVAR = chimney endovascular aneurysm repair.

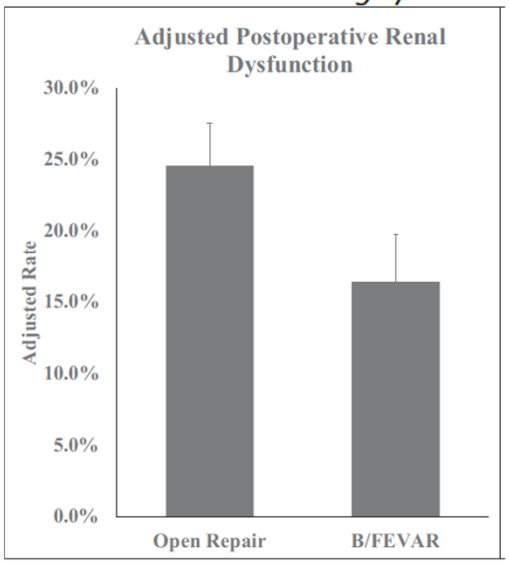
Morbiditv

Open Versus Fenestrated Endovascular Repair of Complex Abdominal Aortic Aneurysms

Thomas F. X. O'Donnell, MD,† Laura T. Boitano, MD,* Sarah E. Deery, MD, MPH,*
Marc L. Schermerhorn, MD,† Andres Schanzer, MD,‡ Adam W. Beck, MD,§ Richard M. Green, MD,¶
Hiroo Takayama, MD, PhD,¶ and Virendra I. Patel, MD, MPH¶*

Annals of Surgery • Volume 271, Number 5, May 2020





Morbidity

Open surgical repair of juxtarenal abdominal aortic aneurysms in the elderly is not associated with increased thirty-day mortality compared with fenestrated endovascular grafting

Ethan S. Rosenfeld, MD, Robyn A. Macsata, MD, Salim Lala, MD, K. Benjamin Lee, MD, Benjamin J. Pomy, MD, John J. Ricotta, MD, Andrew D. Sparks, MS, Richard L. Amdur, PhD, Anton N. Sidawy, MD, MPH, *and* Bao-Ngoc Nguyen, MD, *Washington, D.C.*

Journal of Vascular Surgery
Volume 73, Number 4

Outcome	OSR (n = 136)	FEVAR (n = 136)	OSR vs FEVAR	
			OR (95% CI)	*P* value
Mortality	6 (4.4)	5 (3.7)	1.21 (0.36-4.06)	.759
MACE	11 (8.1)	5 (3.7)	2.31 (0.78-6.82)	.131
Cardiac	10 (7.4)	5 (3.7)	2.08 (0.69-6.25)	.193
Stroke	1 (0.7)	0 (0.0)	NE	NA
Pulmonary	26 (19.1)	5 (3.7)	6.19 (2.30-16.67)	**<.001**
Pneumonia	14 (10.3)	3 (2.2)	5.09 (1.43-18.13)	**.012**
Prolonged intubation >48 hours	12 (8.8)	2 (1.5)	6.48 (1.42-29.55)	**.016**
Unplanned reintubation	15 (11.0)	3 (2.2)	5.50 (1.55-19.45)	**.008**
Renal	11 (8.1)	3 (2.2)	3.90 (1.06-14.31)	**.040**
Progressive renal insufficiency[a]	4 (2.9)	2 (1.5)	2.03 (0.37-11.27)	.418
Acute renal failure	7 (5.2)	1 (0.7)	7.33 (0.89-60.36)	.064
Ischemic colitis	6 (4.4)	2 (1.5)	3.09 (0.61-15.60)	.172
Unplanned reoperation	7 (5.2)	6 (4.4)	1.18 (0.39-3.59)	.776

CI, Confidence interval; *MACE*, major adverse cardiovascular/cerebrovascular events; *NA*, not applicable; *NE*, no events recorded; *OR*, odds ratio.
Boldface *P* values represent statistical significance ($P < .05$).
Data presented as number (%), unless noted otherwise.
[a]Defined as an increase in serum creatinine >2 mg/dL from the preoperative value.

Improved efficiency

Impact of a new stepped balloon for bridging stent implantation on procedural time and radiation exposure in fenestrated endovascular aortic repair

Journal of Vascular Surgery
Volume 83, Number 2

Federico Francisco Pennetta, MD,[a] Mickael Palmier, MD,[a] Laure Laporte, PhD,[b] Alexandre Oliny, MD,[a] Emanuele Carmelo Grasso, MD,[a] Dominique Fabre, MD, PhD,[a] *and* Stéphan Haulon, MD, PhD,[a] *Buc and Paris, France*

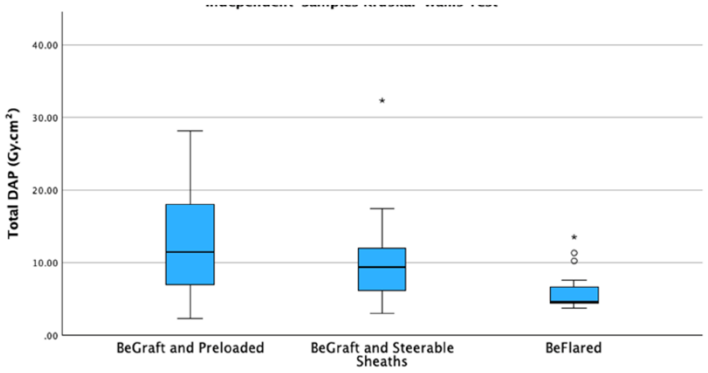


Table III. Stenting times

Stenting time	Overall (n = 60)	BeGraft and preloaded (n = 20)	BeGraft and steerable sheath (n = 20)	BeFlared and steerable sheath (n = 20)	*P* value
Total stenting time, minutes	16.2 (11.7-20.6)	20.2 (15.5-21.7)	17.4 (15.2-22.4)	11.3 (10.9-12)	**<.001**
CT, minutes	2 (1-2.6)	2.6 (2.1-2.9)	2.2 (1.6-2.7)	0.9 (0.8-1)	**<.001**
SMA, minutes	2.1 (1-3.1)	3.4 (3-3.9)	1.9 (1.7-2.6)	0.9 (0.7-1.2)	**<.001**
Right renal artery, minutes	2.5 (1.2-2.9)	2.9 (2.6-4.2)	2.5 (1.8-2.7)	0.8 (0.6-1.2)	**<.001**
Left renal artery, minutes	2.3 (0.8-3.3)	3.3 (3-4.1)	2.2 (1.5-3)	0.6 (0.5-1.1)	**<.001**

CT, Celiac trunk; *SMA*, superior mesenteric artery.
Values are median (interquartile range). Boldface entries indicate statistical significance.

Improved Efficiency

Trends and outcomes over time with fenestrated and branched endovascular aortic repair in the United States Aortic Research Consortium

Eric J. Finnesgard, MD, MS,[a] Douglas W. Jones, MD, MS,[a] Adam W. Beck, MD,[b] Matthew J. Eagleton, MD,[c] Mark A. Farber, MD,[d] Warren J. Gasper, MD,[e] W. Anthony Lee, MD,[f] Gustavo S. Oderich, MD,[g] Darren B. Schneider, MD,[h] Matthew P. Sweet, MD, MS,[i] Carlos H. Timaran, MD,[j] *and* Andres Schanzer, MD,[a] on

Journal of Vascular Surgery
Volume 76, Number 5

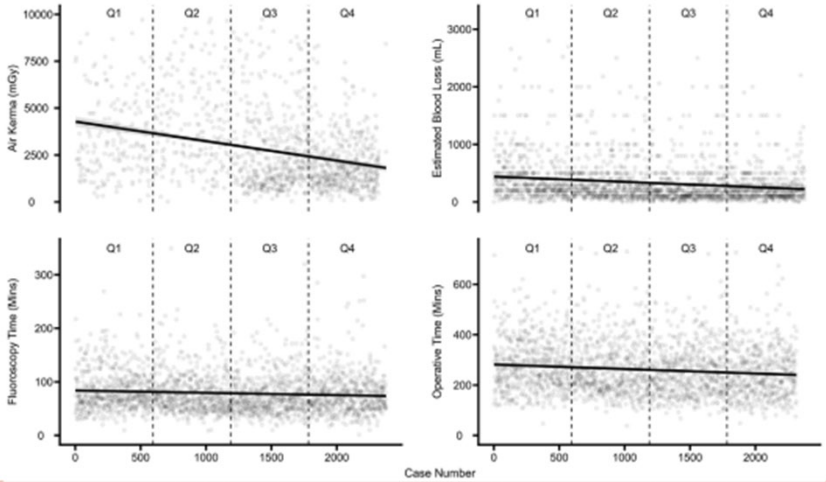


Fig 1. Perioperative metrics including air kerma, estimated blood loss, fluoroscopy time, and operative time over time after fenestrated and branched endovascular aortic repair (F/B-EVAR), stratified by case quartile.

Durability

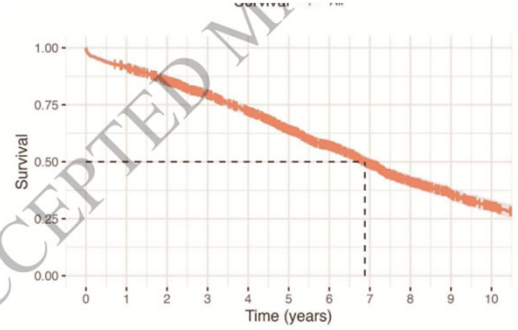
> Br J Surg. 2026 Mar 27:znag037. doi: 10.1093/bjs/znag037. Online ahead of print.

Nationwide outcomes of Fenestrated Endovascular Aneurysm Repair

Aurélien M Guéroult [1 2], M Jusczak [3], P Holt [1 2], S Neequaye [4];
British Society of Endovascular Surgery and the GLOBALSTAR Collaborators

- 1651 patients in UK registry:
  - 3 year survival: 79.5%
  - 5 year survival: 64.1%
  - 10 year survival: 30.5%

- 7 year median survival



Time (years)	0	1	2	3	4	5	6	7	8	9	10
N at risk	1651	1507	1368	1212	1055	852	684	520	374	264	185
Survival (%)	100	91.5	85.4	79.5	72.0	64.1	57.1	48.9	41.2	35.7	30.5
95% CI (%)	.	90.1-92.8	83.7-87.1	77.6-81.5	69.8-74.2	61.7-66.6	54.6-59.7	46.3-51.7	38.5-44.1	33.0-38.7	27.7-33.5

Survival in red with 95% CI ribbon. Median survival in dashed line.

Durability

Editor's Choice – Single Centre Midterm Experience with Primary Fenestrated Endovascular Aortic Aneurysm Repair for Short Neck, Juxtarenal, and Suprarenal Aneurysms

Athanasios Katsargyris [a,*], Pablo Marques de Marino [a], Natasha Hasemaki [a], Sebastian Nagel [a], Balazs Botos [a], Manuela Wilhelm [a], Eric L.G. Verhoeven [a]

Eur J Vasc Endovasc Surg (2023) 66, 160–166

- 341 patients
  - 69% 5 year survival and 98% aneurysm related survival.
  - 98.7% target vessel patency and 97% freedom from target vessel intervention
  - 86.5% freedom from reintervention at 5 years.

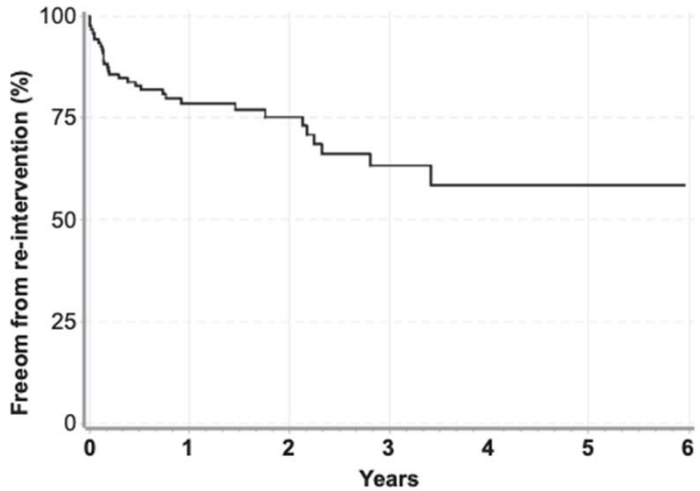
Re-interventions

Reinterventions after fenestrated or branched endovascular aortic aneurysm repair

Vascular Surgery
Number 3

Shernaz S. Dossabhoy, MS, MBA, Jessica P. Simons, MD, MPH, Kyle R. Diamond, MD, Julie M. Flahive, MS, Francesco A. Aiello, MD, Edward J. Arous, MD, Louis M. Messina, MD, *and* Andres Schanzer, MD,
Worcester, Mass

- 123 patients, 25 month follow up, 25% reintervention rate
- 67% percutaneous



Year:	0	1	2	3	4	5
Number of patients at risk:						
	123	64	37	20	9	3
Survival estimate:						
	100%	79%	5%	63%	58%	58%
Survival SE:						
	0	0.039	0.044	0.062	0.074	0.074

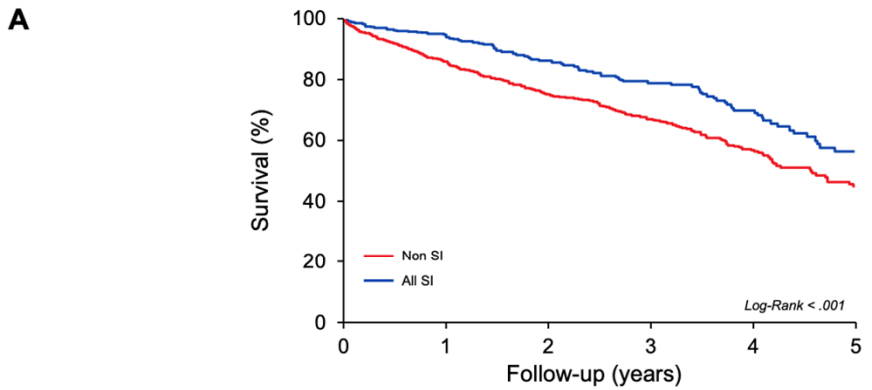
Reinterventions

Secondary interventions after fenestrated/branched aneurysm repairs are common and nondetrimental to long-term survival

Sara L. Zettervall, MD, MPH,[a] Emanuel R. Tenorio, MD, PhD,[b] Andres Schanzer, MD,[c] Gustavo S. Oderich, MD,[b]

Journal of Vascular Surgery
Volume 75, Number 5

- 1681 patients, 23% reintervention rate:
  - 84% percutaneous
  - 70% minor
  - 81% low magnitude.
  - 94% technical success rate
  - Reintervention associated with increased survival



Non SI	Number at risk	1296	731	415	270	142	55
	Kaplan – Meir estimate survival rates	1	0.855	0.748	0.666	0.563	0.442
	Standard error	0	0.011	0.015	0.019	0.023	0.031
All SI	Number at risk	385	308	227	151	89	43
	Kaplan – Meir estimate survival rates	1	0.939	0.861	0.786	0.695	0.558
	Standard error	0	0.013	0.020	0.025	0.032	0.043

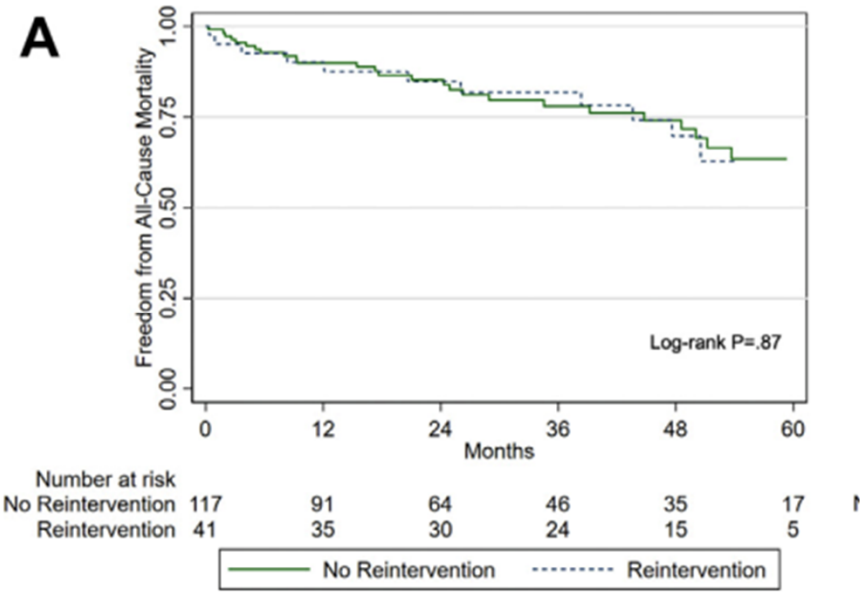
Reinterventions

Reintervention does not affect long-term survival after fenestrated endovascular aneurysm repair

Shernaz S. Dossabhoy, MD, MBA, Sabina M. Sorondo, MD, Kenneth Tran, MD, Jordan R. Stern, MD, Ronald L. Dalman, MD, *and* Jason T. Lee, MD, *Stanford, CA*

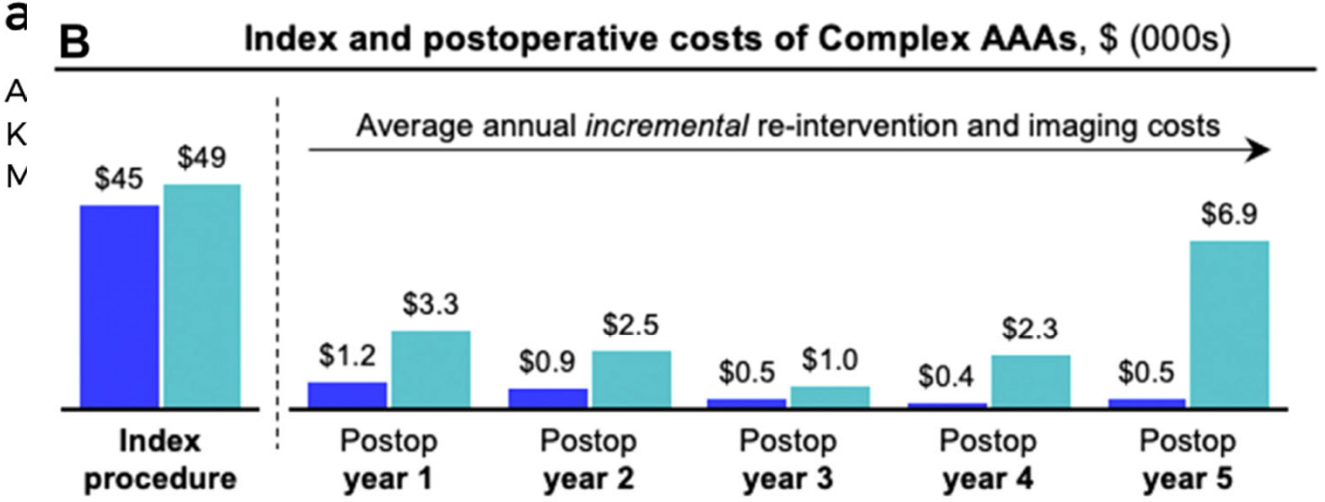
Journal of Vascular Surgery
Volume 76, Number 5

- 219 Z fen repairs
- At 34 months: 26% reintervention rate
- No difference in 30 day and 5 year survival



Cost

Long-term costs to Medicare associated with endovascular and open repairs of infrarenal and complex abdominal aortic a



On adjusted analyses for complex AAAs, **total costs for EVARs at 3-years relative to open repairs were greater by $9664 (P<.01)**

ıta, MD,[a,d]
MD, MPH,[b] *and*
ME; and Gainesville, FL

ırnal of Vascular Surgery
lume 80, Number 1

Cost

Editor's Choice — A Study of the Cost-effectiveness of Fenestrated/branched EVAR Compared with Open Surgery for Patients with Complex Aortic Aneurysms at 2 Years

Eur J Vasc Endovasc Surg (2018) 56, 15—21

Table 4. Total hospital costs at 2 years, all payers perspective (in 2012€).

	f/b EVAR Mean (SD)	*p*	OSR Mean (SD)	*p*	*p* (f/b EVAR vs. OSR)
Initial admission					
All patients	37,708 (23,196)		15,637 (15,610)		<.001
Para/juxtarenal AAA	33,889 (22,011)	<.001	14,103 (11,898)	<.001	<.001
Infra-diaphragmatic TAAA	37,472 (11,824)		16,632 (11,831)		<.001
Supra-diaphragmatic TAAA	54,121 (29,069)		42,352 (42,700)		.117
Readmissions					
All patients	12,791 (16,679)		11,749 (18,442)		<.001
Para/juxtarenal AAA	12,014 (16,577)	.430	11,471 (17,487)	<.001	.752
Infra-diaphragmatic TAAA	12,136 (14,036)		10,090 (16,767)		.575
Supra-diaphragmatic TAAA	16,466 (19,028)		23,097 (34,019)		.347
Total costs at 2 years					
All patients	46,039 (27,371)		22,779 (24,228)	<.001	<.001
Para/juxtarenal AAA	41,786 (26,290)	<.001	21,142 (20,358)		<.001
Infra-diaphragmatic TAAA	44,575 (16,956)		22,551 (18,725)		<.001
Supra-diaphragmatic TAAA	65,491 (31,909)		55,364 (60,281)		.316

Cost

Fenestrated endovascular aneurysm repair is financially viable at a high-volume medical center with positive hospital contribution margins and physician payment

Warren B. Chow, MD, Denise M. Leverentz, MBA, Billi Tatum, RN, *and* Benjamin W. Starnes, MD, *Seattle, Wash*

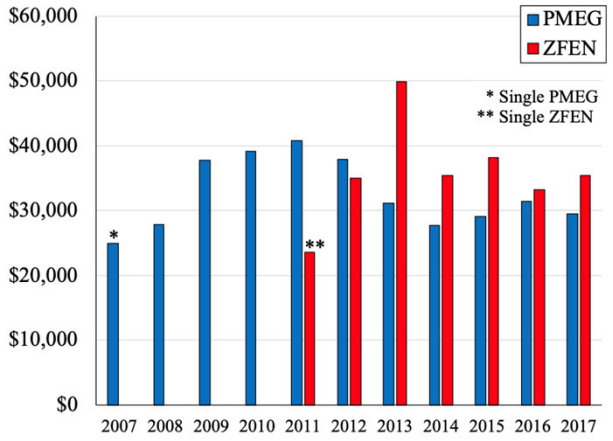


Fig 6. The trend in average direct cost from the index encounter associated with fenestrated endovascular aneurysm repair (FEVAR), differentiated between

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Costs

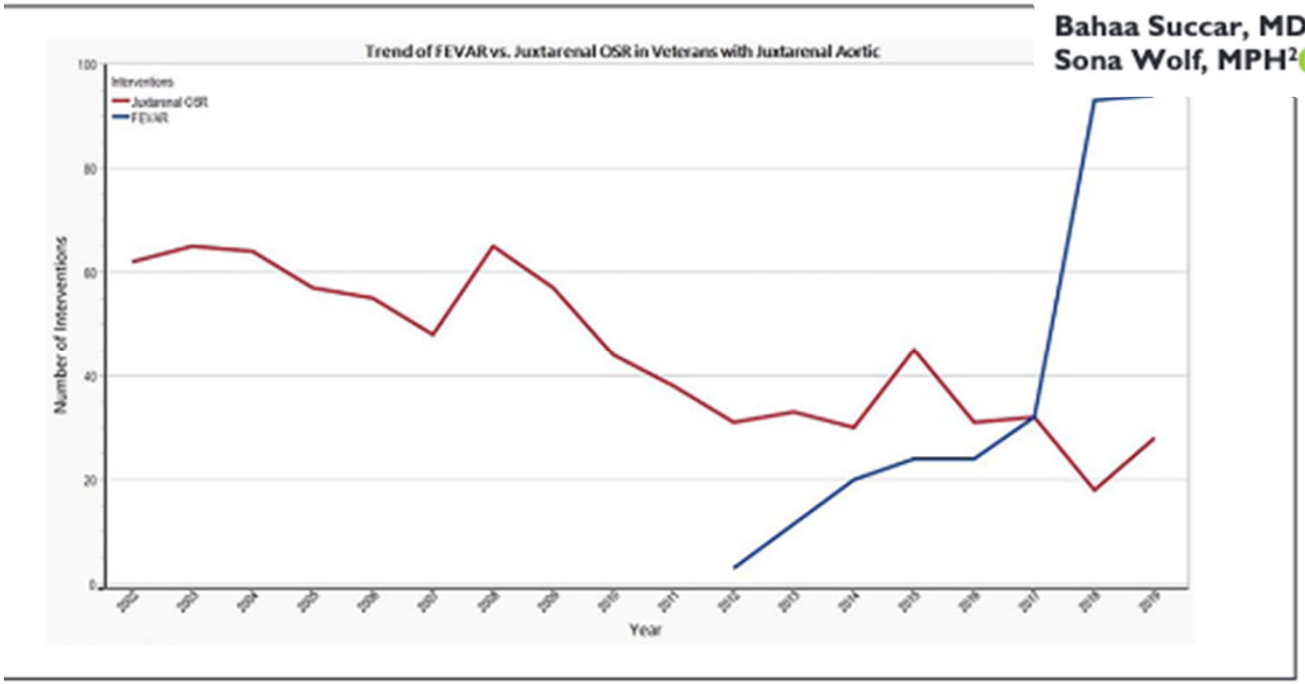
- Are context dependent
- Are mainly driven by endograft costs which is decreasing
- Are further driven by length of stay, which is decreasing
- Do not account for:
  - Lost productivity
  - Caregiver expenses / strain
  - Quality of life
  - Complication expenses (incisional hernia)

Experience

Outcomes and Imaging Surveillance Adherence in Juxta-Renal Aortic Aneurysms Repairs: A VASQIP Retrospective Study

Bahaa Succar, MD[1], Melissa D'Andrea, MD[1], Yazan Ashouri, MD[1], Sona Wolf, MPH[2], Hsu Chiu-Hsieh, PhD[3], and Wei Zhou, MD[1,4]

Journal of Endovascular Therapy 33(2)

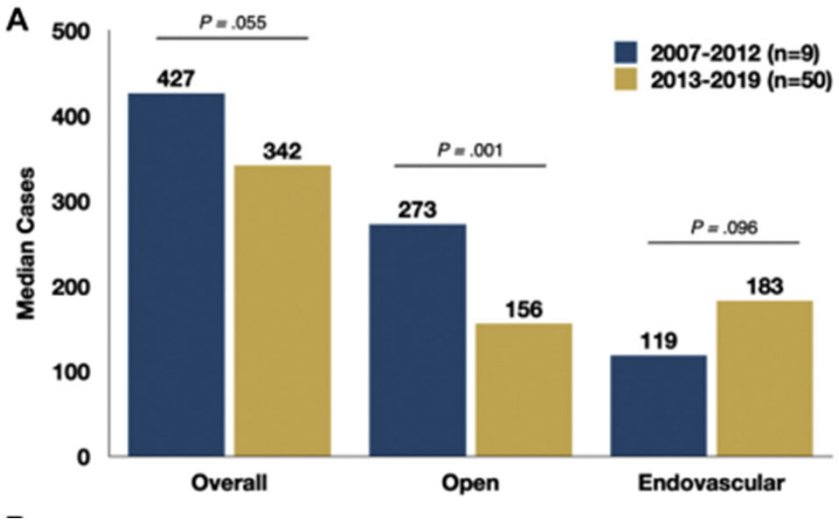


Training

Trends in operative case volumes of Canadian vascular surgery trainees

Musaad AlHamzah, MBBS, MPH,[a,b] Mohamad A. Hussain, MD, PhD,[c,d,e] Elisa Greco, MD, Med,[f,g]

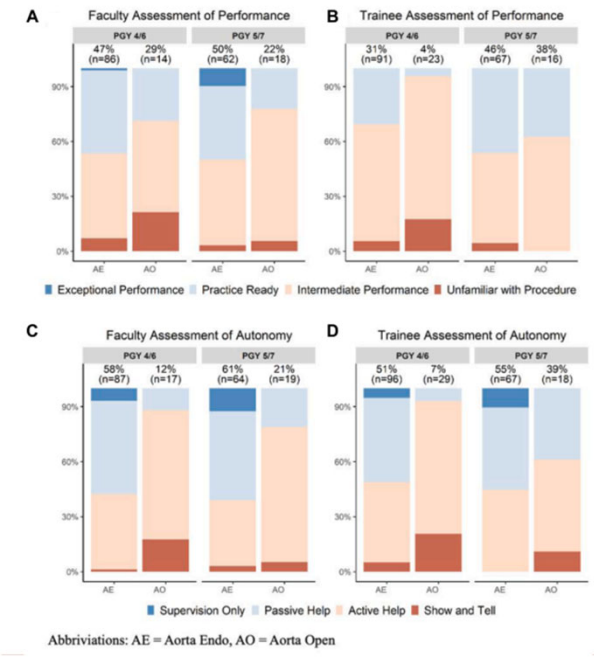
Journal of Vascular Surgery
Volume 75, Number 2



Vascular surgery residents and fellows graduate at higher levels of proficiency in endovascular as compared to open aortic operations

Erin Buchanan, MD,[a] Ting Sun, PhD,[b] Nathan Droz, MD,[c] Benjamin S. Brooke, MD, PhD,[c]
Brigitte K. Smith, MD, MHPE,[d] *and* M. Libby Weaver, MD, MHPE,[c] *Milwaukee and Madison WI; and Salt Lake City, UT*

Journal of Vascular Surgery
Volume 83, Number 3



Abbreviations: AE = Aorta Endo, AO = Aorta Open

Conclusion

- FEVAR associated with decreased short morbidity/mortality and likely similar long term outcomes
- Reintervention rate is higher, but small procedures
- FEVAR cost decreasing and representing increased value
- Surgeon and training experience increasingly FEVAR

FEVAR is the future

Rebuttal

Declining institutional memory of open abdominal aortic aneurysm repair

Anna Kinio, MD, MSc,[a] Tim Ramsay, PhD,[b] Prasad Jetty, MD, FRCSC,[a,c] *and* Sudhir Nagpal, MD, FRCSC,[a,c]
Ottawa, Ontario, Canada

Journal of Vascular Surgery
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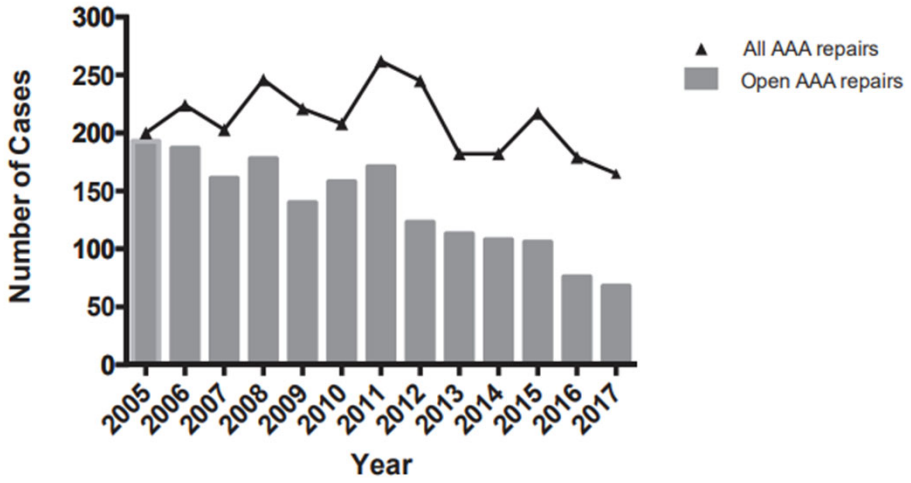

Fig 2. Trends in number of abdominal aortic aneurysm (*AAA*) repairs at The Ottawa Hospital.