

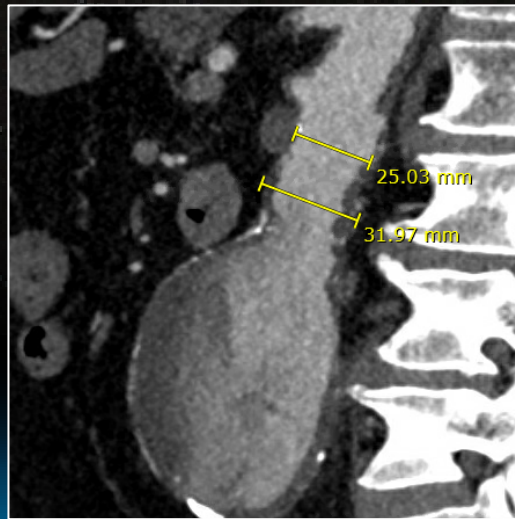
The Proximal Aortic Neck as a Predictor of Long-term Outcome after Open and Endovascular Aneurysm Repair

Jan D. Blankensteijn and Ted G. van Schaik
On behalf of DREAM-trial collaborators

Take Home Message

(similar to: *“Endoleak is achilles heel of EVAR”*):

Infrarenal neck is key driver of long-term success



“My favorite meeting” (Frank Lederle, 2016)

AORTIC DISEASES
New insights into an old problem

2nd International Meeting on Aortic Diseases
New insights into an old problem

September 30 & October 1-2
2010

Natzi Sakalihasan, Helena Kallikrinos, Jean-Baptiste Michel

ADVANCED PROGRAM

3rd International Meeting on Aortic Diseases
New insights into an old problem

October 4-6
2012
Congress Center Liège, Belgium
www.chuliege-ima.be

ADVANCED PROGRAM

4th International Meeting on Aortic Diseases
New insights into an old problem

September 11-13
2014
Crowne Plaza Hotel Liège, Belgium
www.chuliege-ima.be

FINAL PROGRAM

5th International Meeting on Aortic Diseases
New insights into an old problem

September 15-17
2016
Crowne Plaza Hotel Liège, Belgium
www.chuliege-ima.be

First announcement

6th International Meeting on Aortic Diseases
New insights into an old problem

September 12-14
2018
Les Comtes de Méan Liège, Belgium
www.chuliege-ima.be

70th ESCVS CONGRESS & 7th IMAD MEETING
SAVE THE DATE
20 | 23 JUNE 2022
Liege | Théâtre de Liège | Belgium

LOCAL ORGANIZING COMMITTEE
Natzi Sakalihasan, CHU Liège, Belgium
Jean-Olivier Defraigne, CHU Liège, Belgium
ESCVS 2022 Congress Presidents

70th ESCVS
7th IMAD meeting



The early 2000's



THE
A-TEAM



Dutch Randomized Endovascular Aneurysm Management-Trial¹



Government-sponsored, RCT



Multicenter: 26 Dutch and 4 Belgian medical centers



Inclusion between 2000-2003



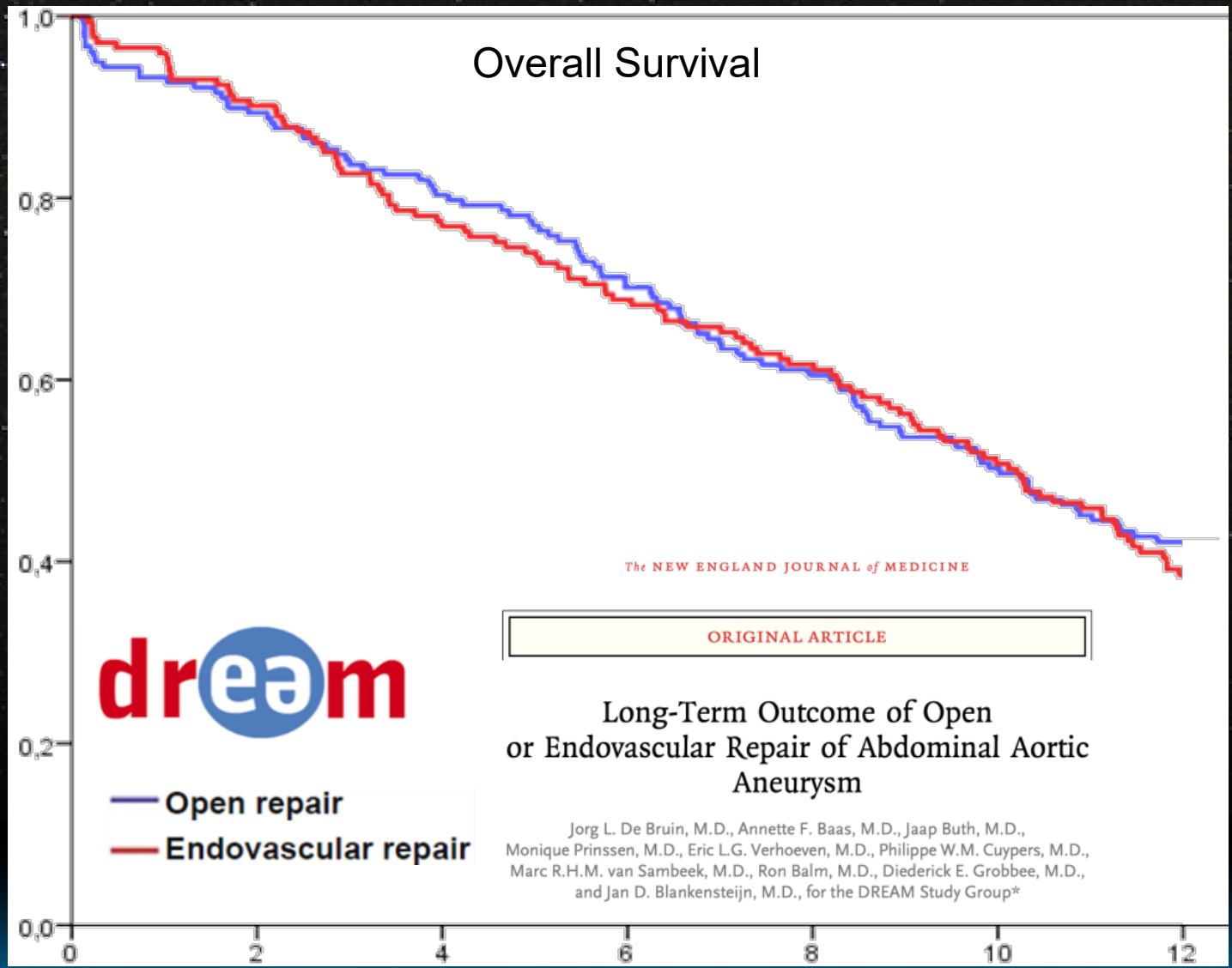
351 patients included



Compared outcomes after elective open (n=178) & elective endovascular aneurysm repair (n=173) for infrarenal abdominal aortic aneurysms

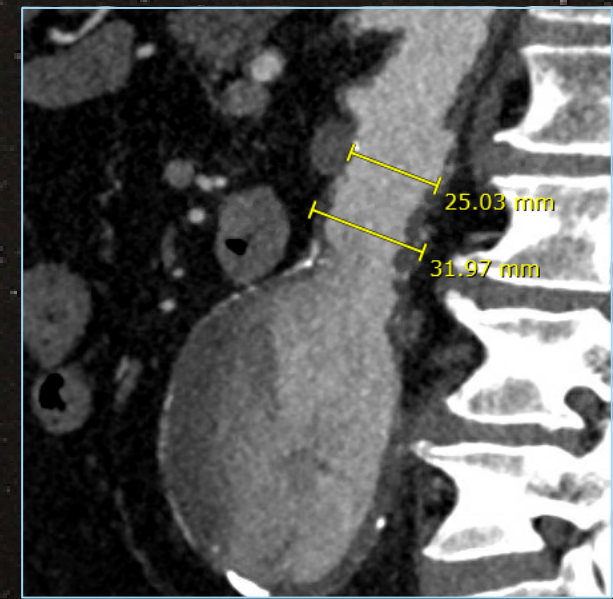


M Prinssen, ELG Verhoeven, J Buth, PWM Cuyper, MRHM van Sambeek, R Balm, E Buskens, DE Grobbee, JD Blankensteijn, DREAM Trial Group. A Randomized Trial Comparing Conventional and Endovascular Repair of Abdominal Aortic Aneurysms. **N Engl J Med 2004; 351:1607-18**



Hypothesis

- **Preoperative infrarenal aortic neck** predicts long-term:
 - Overall patient survival
 - Neck dilatation
 - Neck related reinterventions



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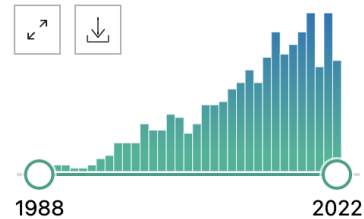
573 results

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Page 1 of 58

RESULTS BY YEAR



TEXT AVAILABILITY

- Abstract
- Free full text
- Full text

ARTICLE ATTRIBUTE

- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Meta-Analysis

1 **Endograft apposition and infrarenal neck enlargement after endovascular aortic aneurysm repair.**
 Cite VAN DER Riet C, DE Rooy PM, Tielliu IF, Kropman RH, Wille J, Narlawar R, Elzezfaf NY, Antoniou GA, DE Vries JP, Schuurmann RC.
 Share J Cardiovasc Surg (Torino). 2021 Dec;62(6):600-608. doi: 10.23736/S0021-9509.21.11972-X. Epub 2021 Sep 14.
 PMID: 34520136
 BACKGROUND: Sufficient apposition and oversizing of the endograft in the **aortic neck** are both essential for durable endovascular **aneurysm** repair (EVAR). These measures are however not regularly stated on post-EVAR computed tomography angiography (CTA) scan re ...

2 **Prognostic Role of Severe Infrarenal Aortic Neck Angulation in Endovascular Aneurysm Repair.**
 Cite Qayyum H, Hansrani V, Antoniou GA.
 Share Eur J Vasc Endovasc Surg. 2021 Sep;62(3):409-421. doi: 10.1016/j.ejvs.2021.05.014. Epub 2021 Jul 21.
 PMID: 34301460
 OBJECTIVE: To investigate whether patients with severe **infrarenal aortic neck** angulation have worse outcomes than those without severe angulation after endovascular **aneurysm** repair (EVAR). ...No statistically significant difference was found for the pr ...

3 **Endograft platform does not influence aortic neck dilatation after infrarenal endovascular aneurysm repair with primary endostapling.**

As of 20-6-2022

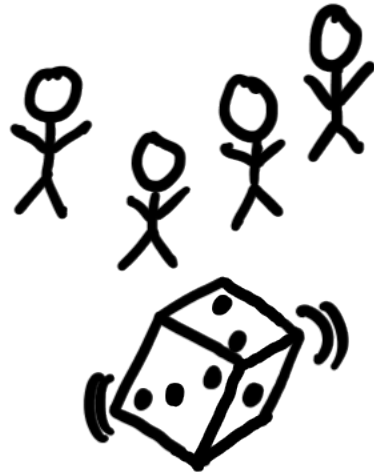
Loren Johnson



LAB
205

Well, I guess we're the control group

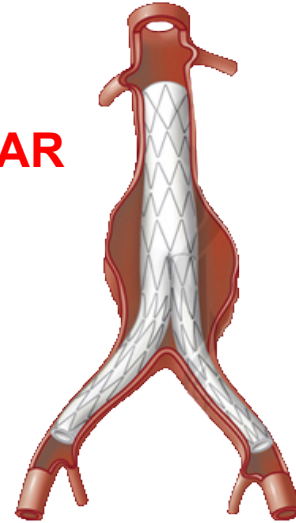




OPEN



EVAR



dream

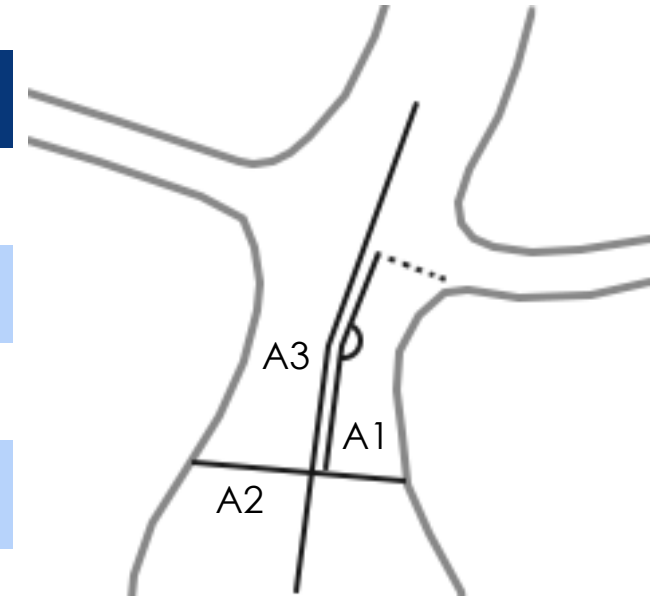
Methods - Imaging

- All patients had CTA by trial protocol
 - pre, 30D, 3M, 6M, 12M, 18M, 24M in both trial arms
- Retrospectively, all additional abdominal CT's beyond 2 years
 - on indication thereafter (mostly EVAR) up to 15 years
 - high rate of abdominal CT over time (unrelated)
- Aneurysm Severity Grading (ASG) score Infrarenal Neck
 - pre-randomization CTA
 - prospectively recorded on DREAM-trial CRF

Anatomy of Infrarenal Aortic Neck

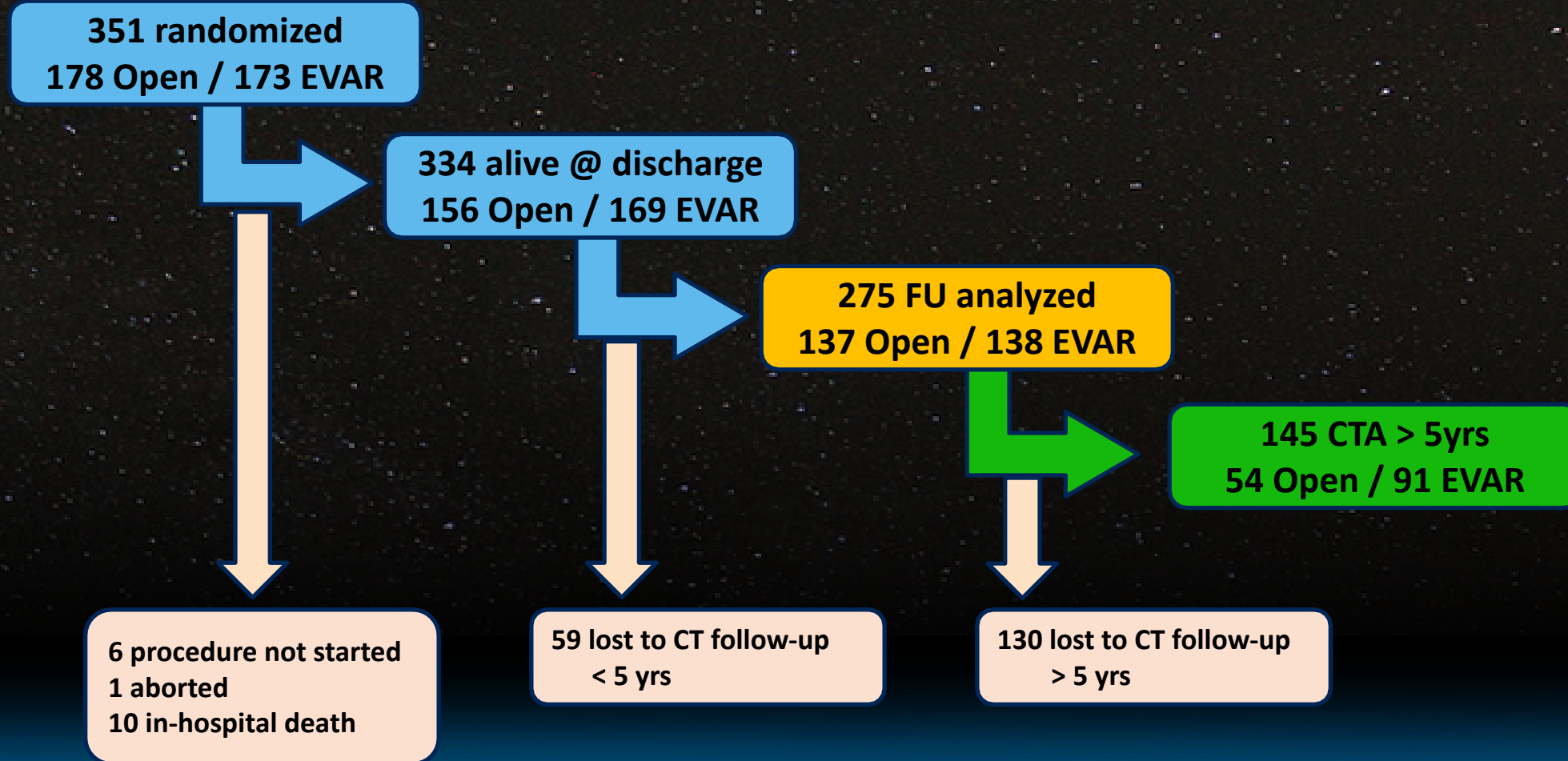
SVS Aneurysm Severity Grading (ASG) *

Characteristics	Absent = 0	Mild = 1	Moderate = 2	Severe = 3
A1. Aortic neck length	> 25 mm	> 15 < 25 mm	> 10 < 15 mm	< 10 mm
A2. Aortic neck diameter	< 24 mm	> 24 < 26 mm	> 26 < 28 mm	> 28 mm
A3. Aortic neck angle	> 150	< 150 > 135	< 135 > 120	< 120
B1. Calcification or Thrombus	< 25%	> 25% < 50%	> 50%	-



* Chaikof EL, Fillinger MF, Matsumura JS, Rutherford RB, White GH, Blankensteijn JD, et al. Identifying and grading factors that modify the outcome of endovascular aortic aneurysm repair. *Journal of Vascular Surgery*. 2002;35(5):1061-6.

Patients and CT's



Endpoints

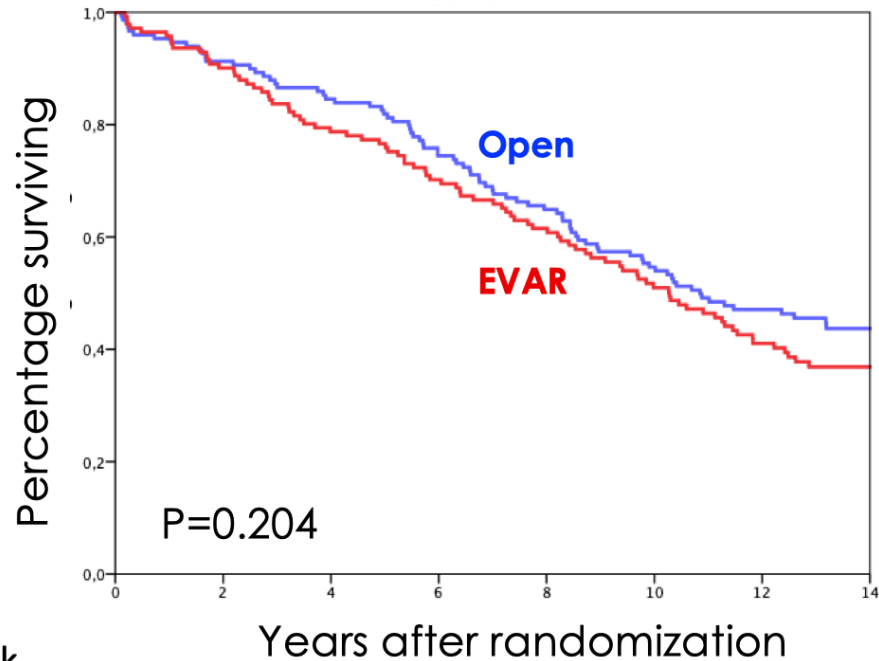
- Cumulative overall survival
 - Follow-up 10.2 years (5.0-12.5 years)
 - Survival Completeness of FU: 98.4%
- Aortic neck dilatation
 - Growth rate (mm/year)
 - Cumulative rate free from growth >15% preop
- Aortic neck-related reinterventions
 - *N=20: all after EVAR, none after Open Repair

Patient Survival



Cumulative overall survival (by ASG-neck score)

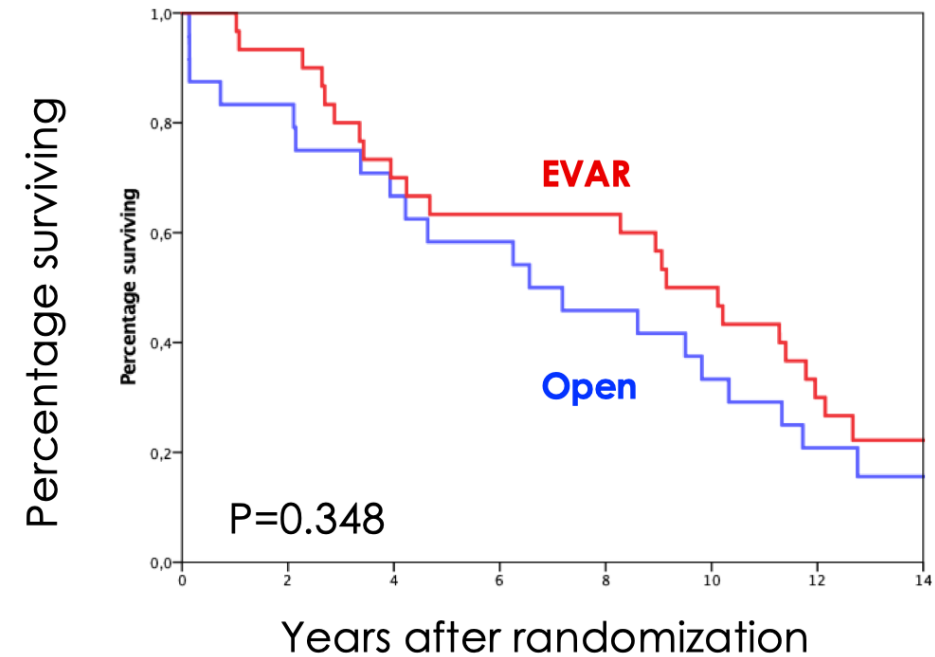
GOOD: ASG-neck score <5



N At Risk

Open	149	136	126	109	95	80	66	29
EVAR	141	127	111	97	83	67	53	25

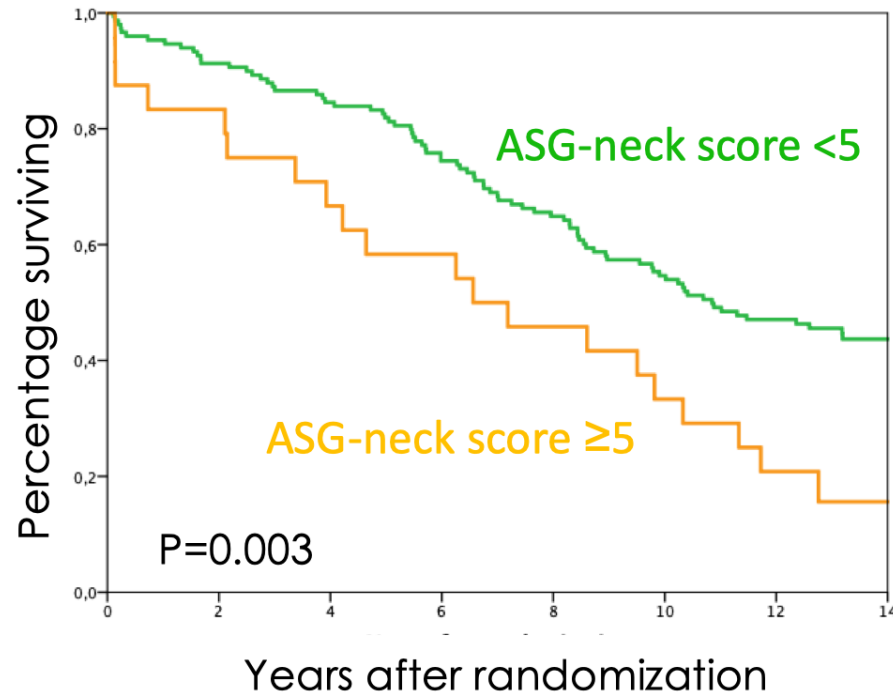
UNFAVOR: ASG-neck score ≥5



Open	24	20	16	14	11	8	5	2
EVAR	30	28	21	19	19	15	9	3

Cumulative overall survival (by procedure)

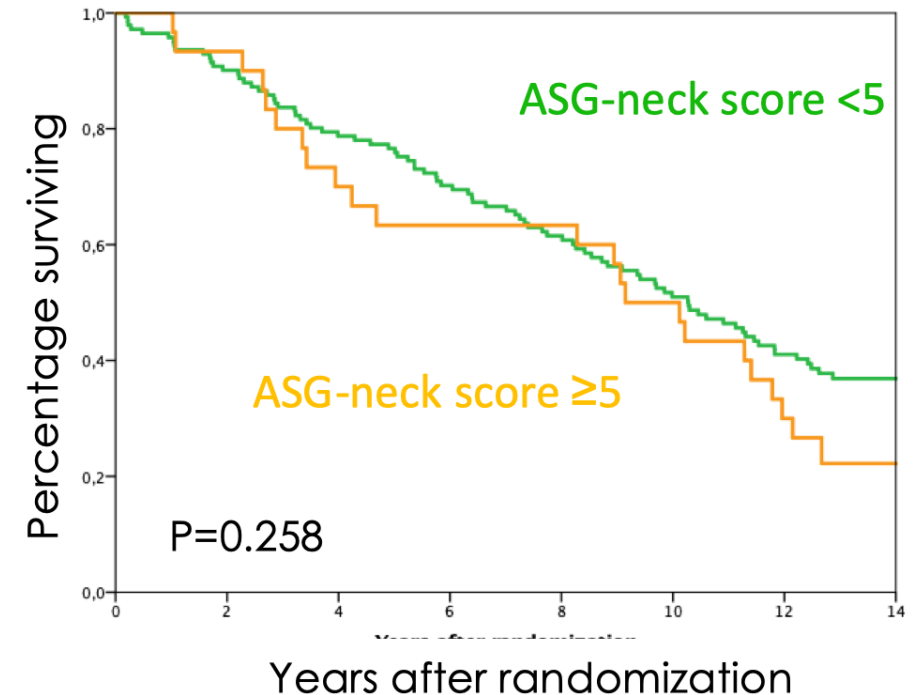
Open Repair



N At Risk

ASG-neck score <5	149	136	126	109	95	80	66	29
ASG-neck score ≥5	24	20	16	14	11	8	5	2

EVAR



ASG-neck score <5	141	127	111	97	83	67	53	25
ASG-neck score ≥5	30	28	21	19	19	15	9	3

*P-values: Cox regression analysis adjusted for gender, age, smoking, cardiac, and renal function

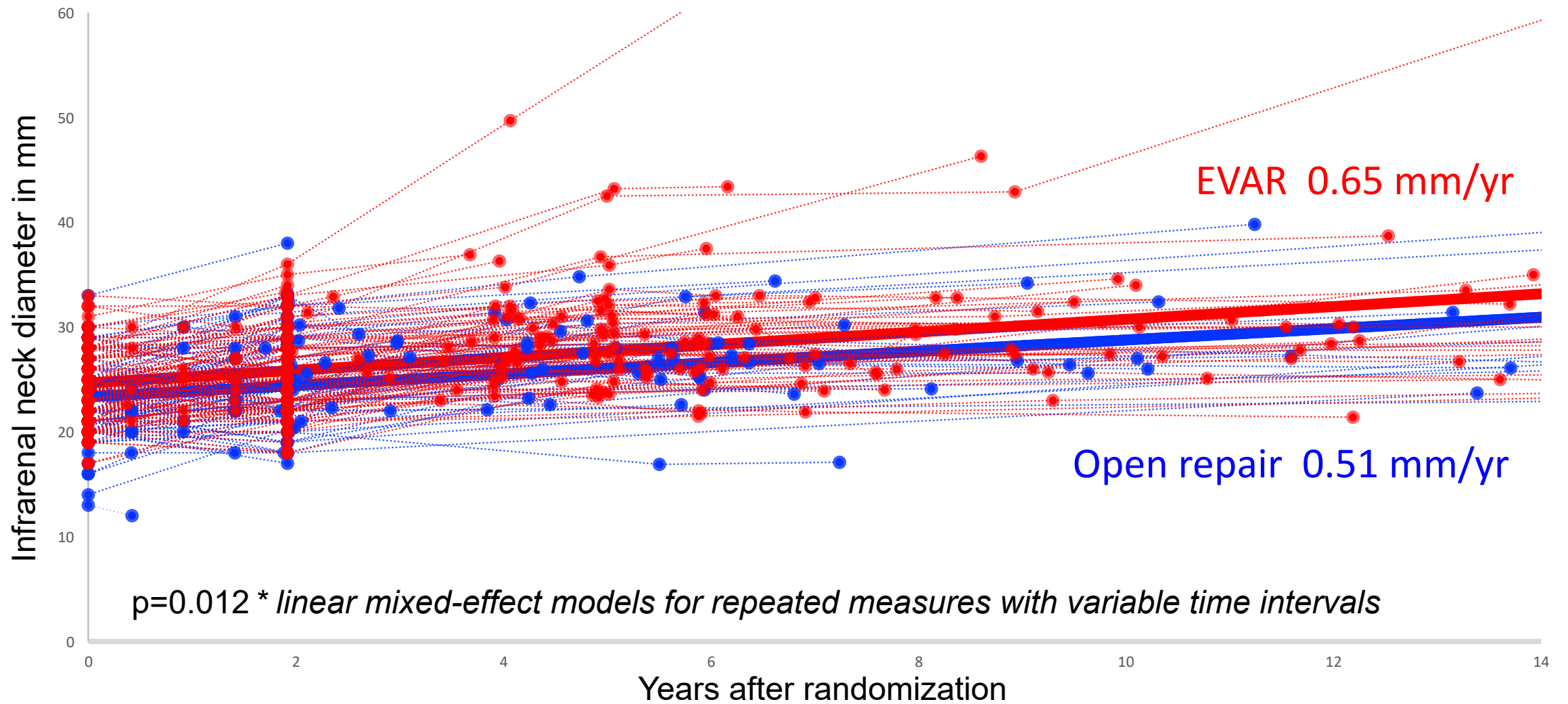
Info graphic #1



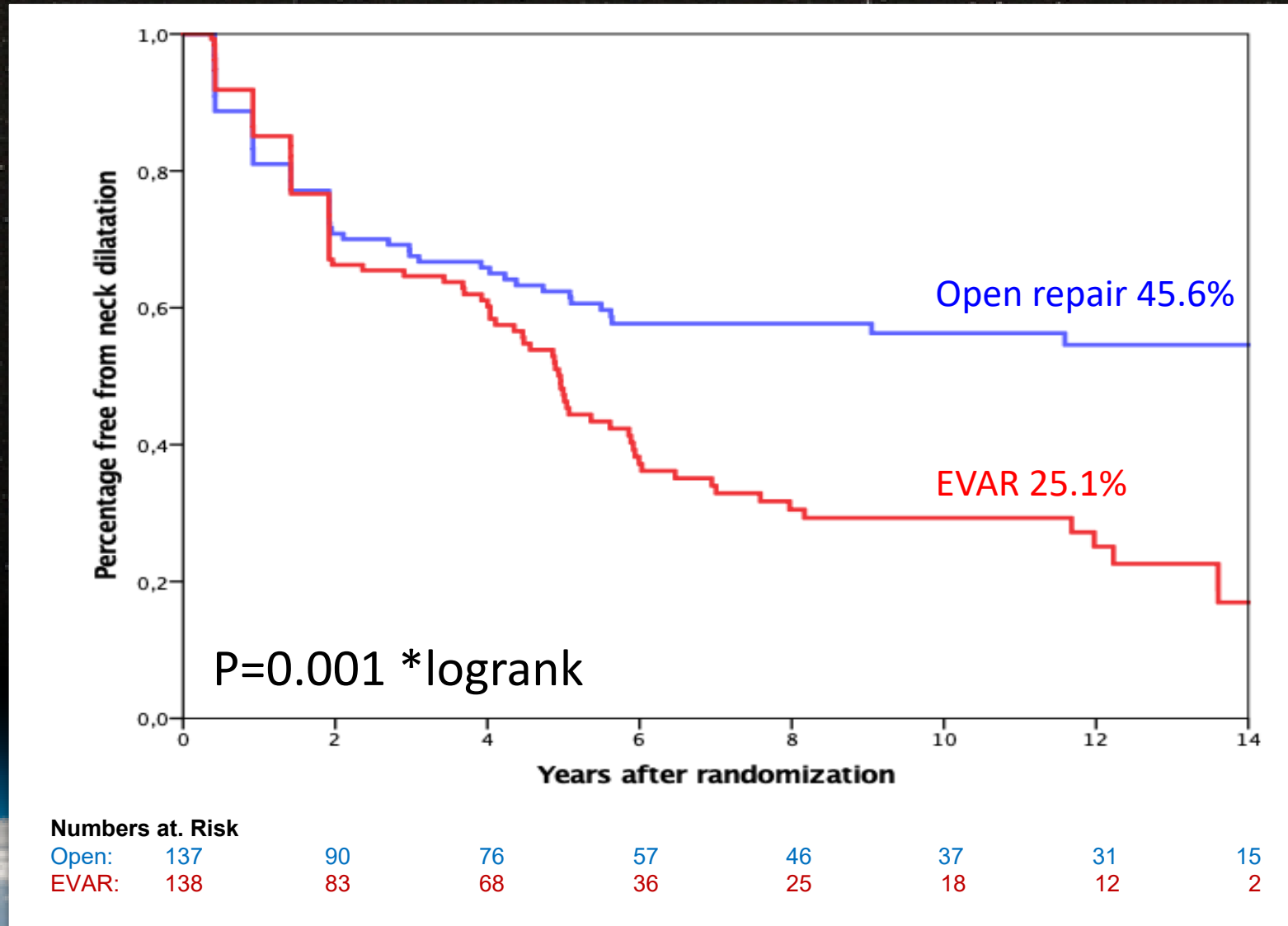
Neck Dilatation



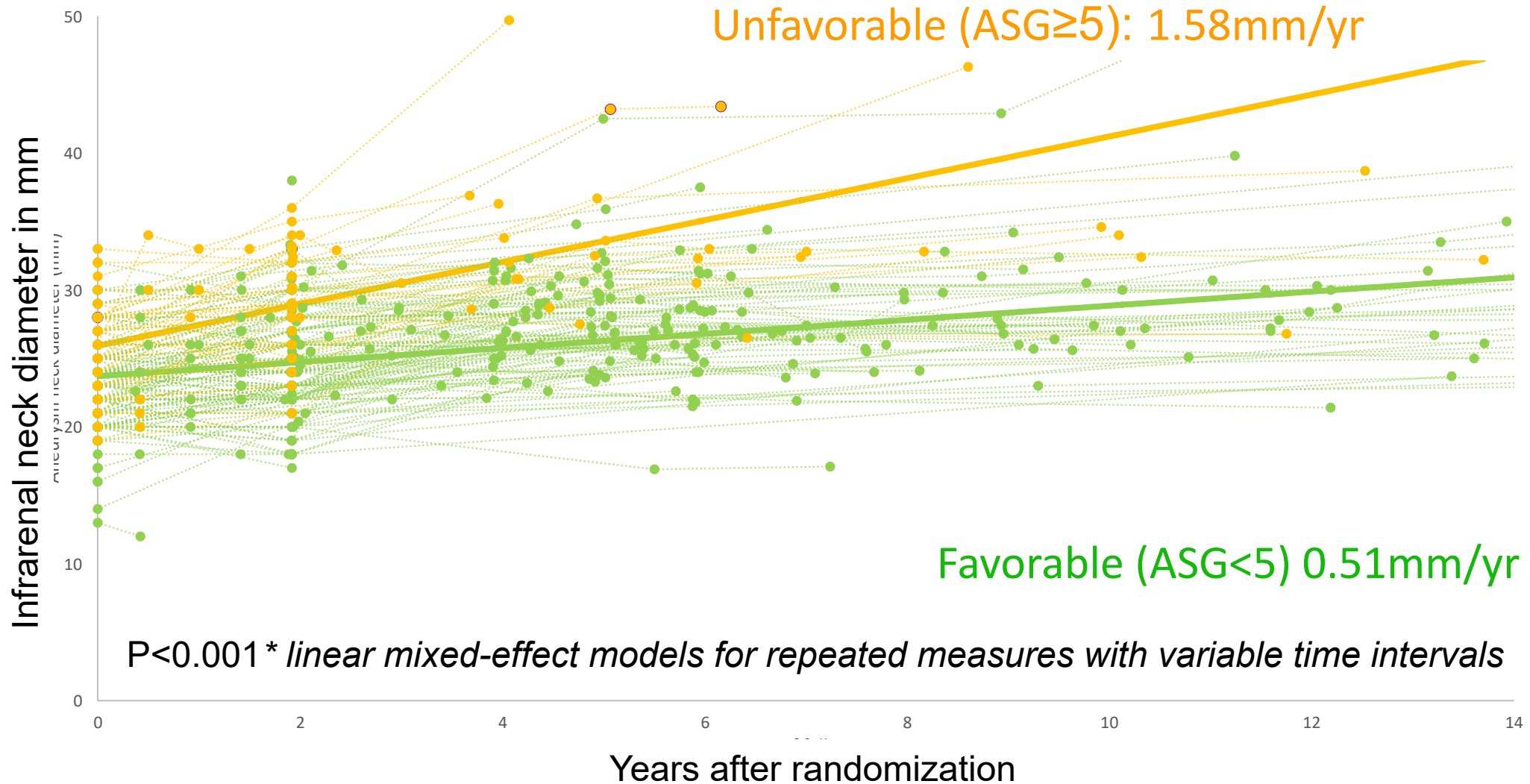
Results - Long-term dilatation in mm/yr



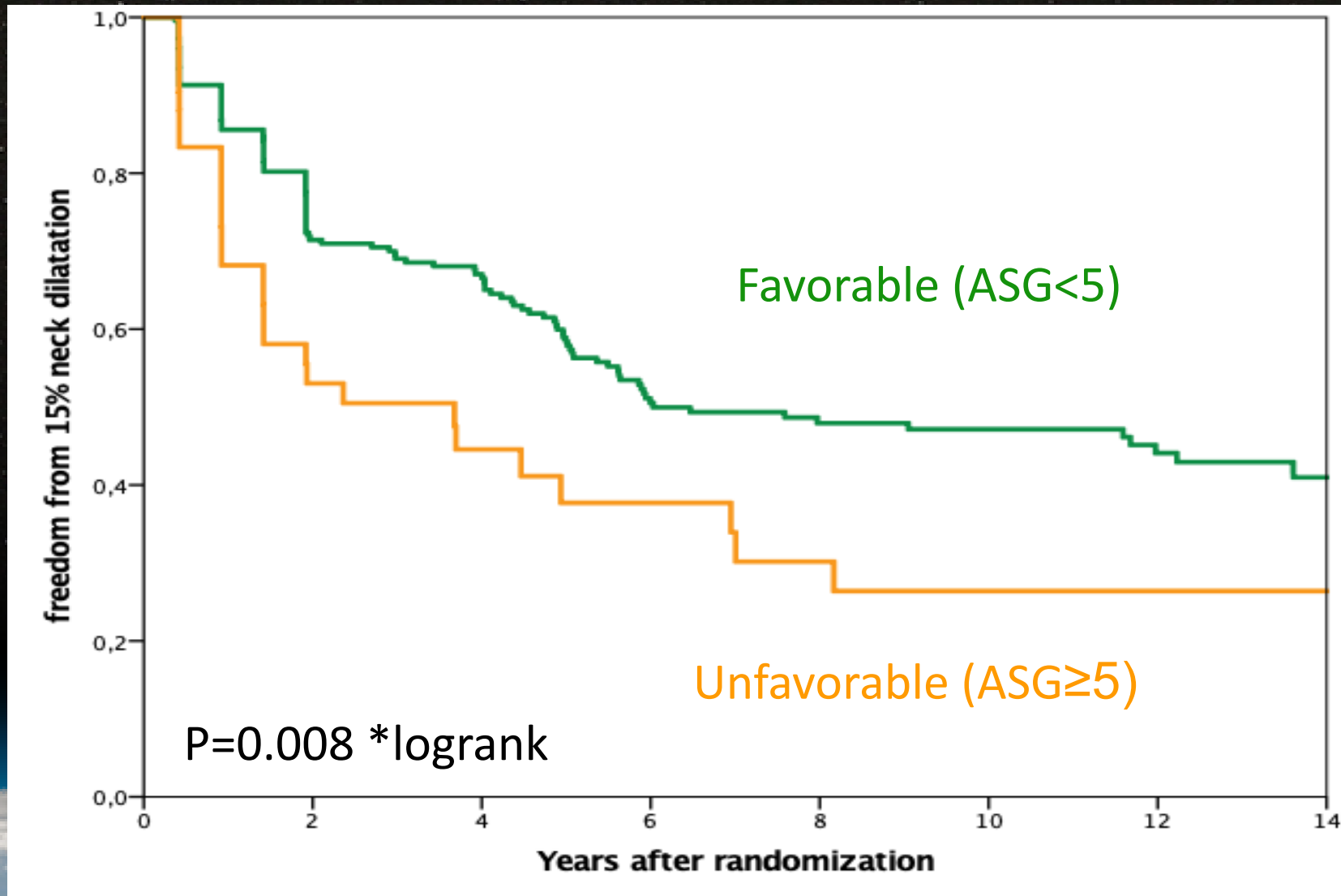
Results - freedom from neck-dilatation (>15%)



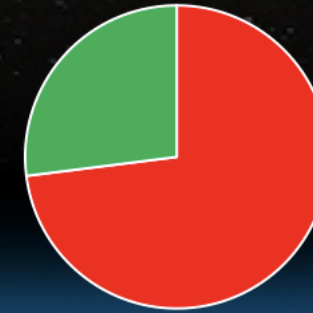
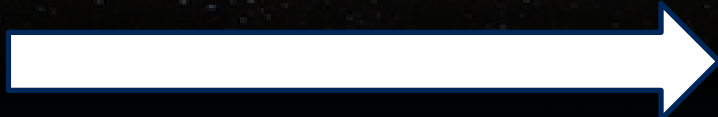
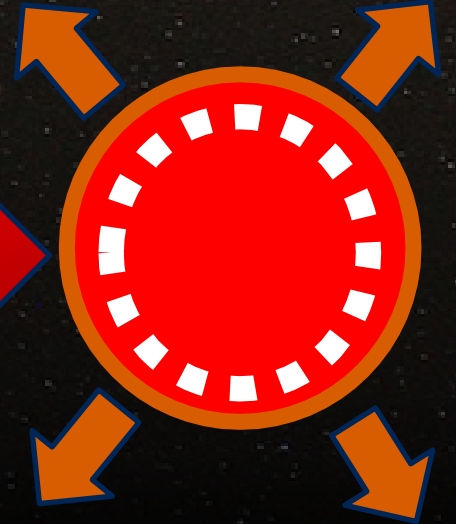
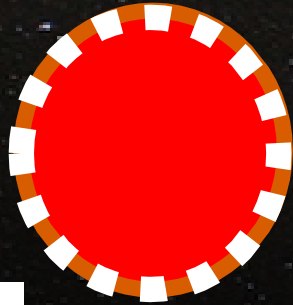
Results - Long-term dilatation in mm/yr



Results - freedom from neck-dilatation (>15%)

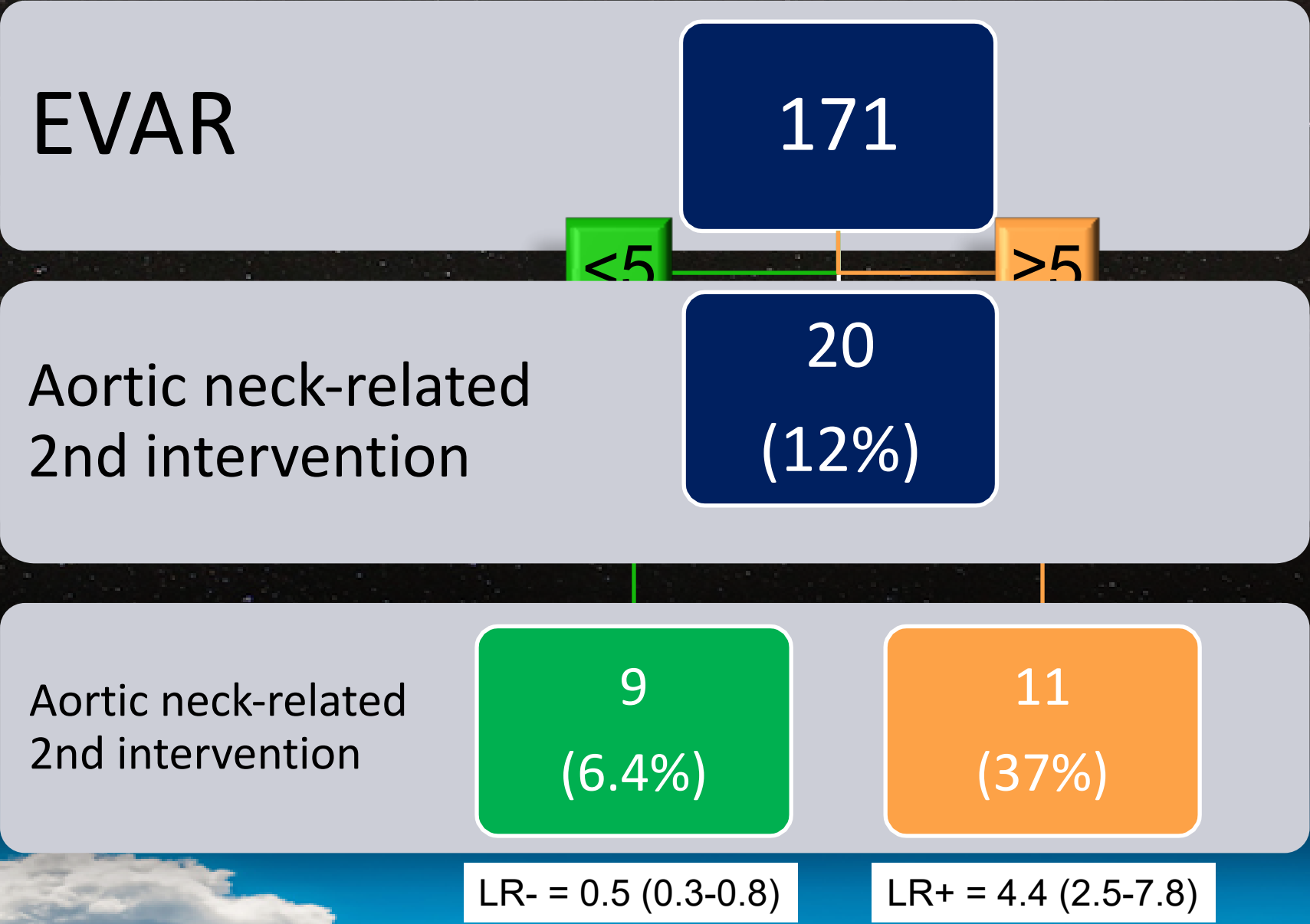


Info graphic #2



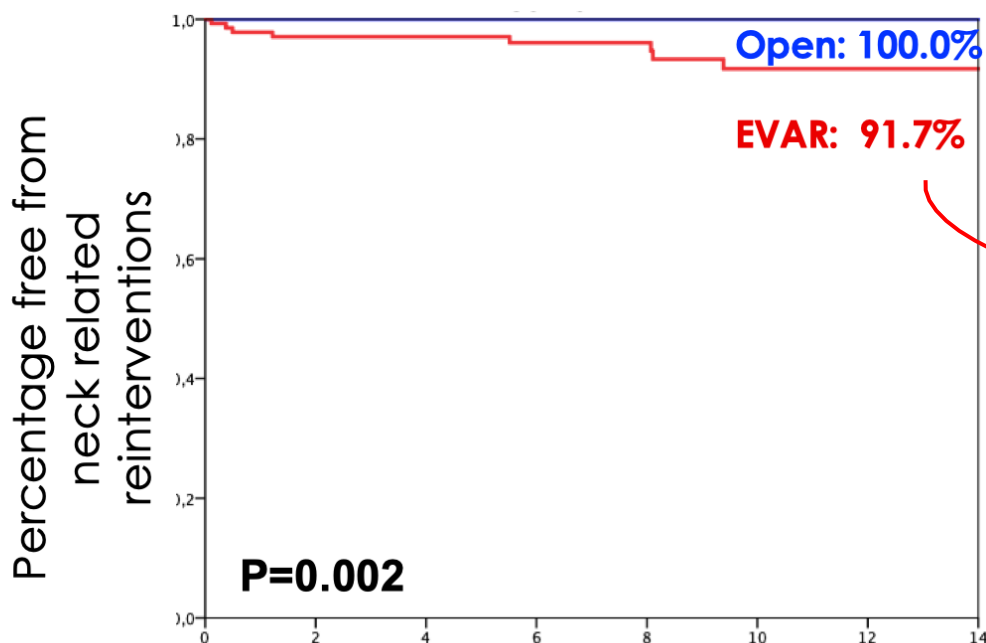
Neck Reinterventions



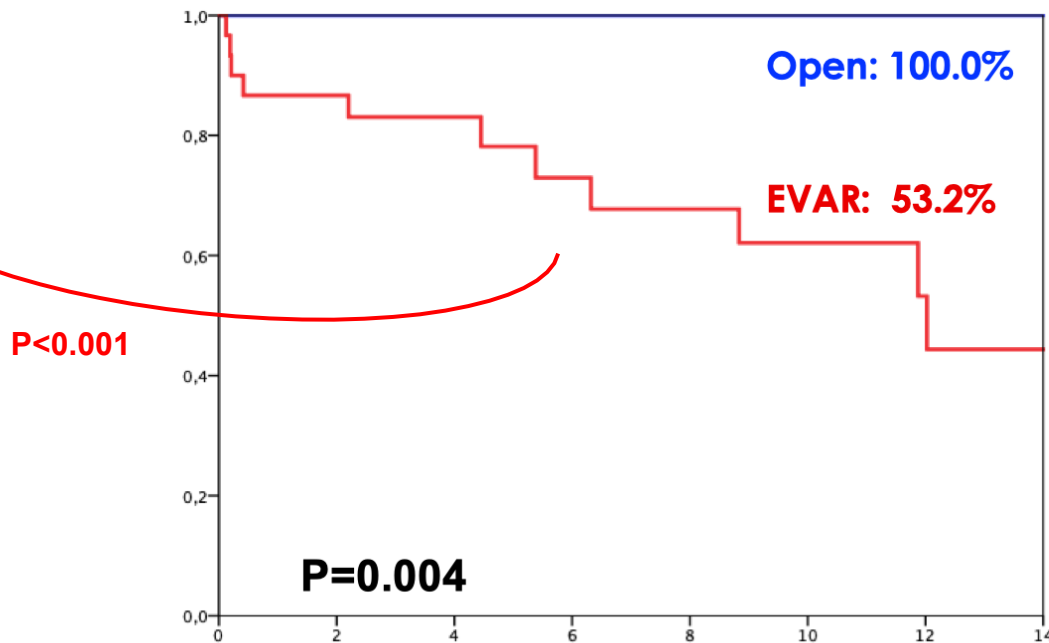


Freedom from neck-related reinterventions * by ASG-neck score

GOOD: ASG neck score <5



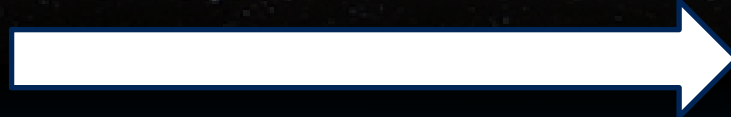
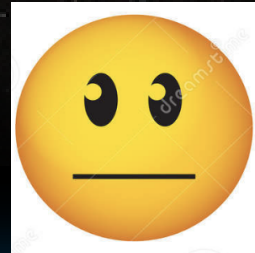
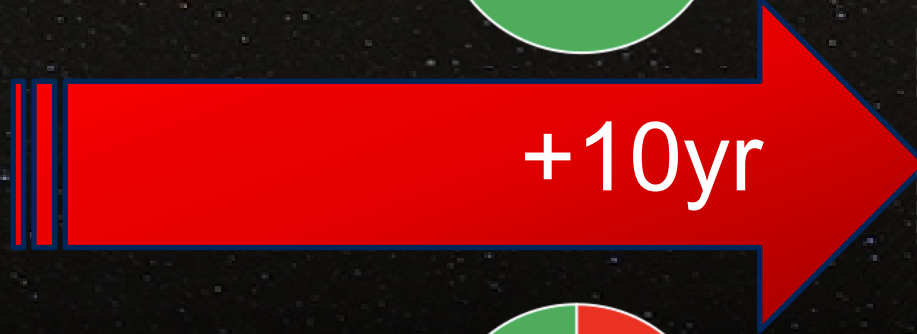
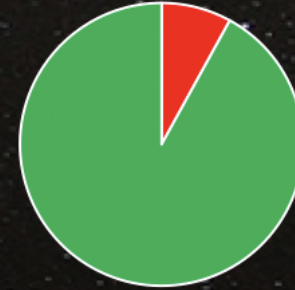
UNFAVOR: ASG neck score ≥ 5



N At Risk	Years after randomization							
	0	2	4	6	8	10	12	14
Open	149	136	126	104	83	76	65	22
EVAR	141	123	108	91	70	55	47	9

N At Risk	Years after randomization							
	0	2	4	6	8	10	12	14
Open	24	20	16	12	7	5	5	2
EVAR	30	24	18	14	12	10	6	2

Info graphic #3



Conclusions

Up to 12 years after aneurysm repair,

Infrarenal Aortic Neck is strong predictor of

- Overall patient survival
- Neck dilatation and loss of potential seal
- Neck related reinterventions

Special thanks to



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– SMM van Sterkenburg, GB ten Haken

Haga Hospital Gravenhage

– CMA Bruijninx, H van Overhagen

Albert Schweitzer Hospital Dordrecht

– RP Tutein Nolthenius, TR Hendriksz

Atrium Medical Center Heerlen

– JAW Teijink, HF Odink

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– AAEA de Smet, D Vroegindewei

Jeroen Bosch Hospital den Bosch

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– P Stabel

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– FEG Vermassen

