

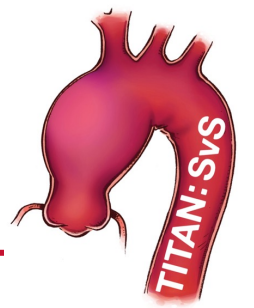


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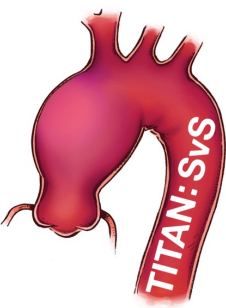
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# Differences in patient characteristics in randomized arm vs. parallel registry of patients with ascending aortic aneurysms: Insights from a contemporary multicenter, prospective trial

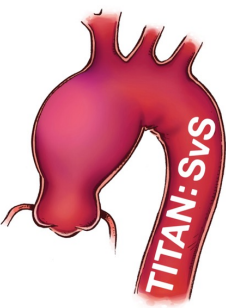
*Aortic Symposium 2024: AATS 104th Annual Meeting*

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## *Background*

- Guidelines for intervention on ascending aortic aneurysm repair are based on data from retrospective studies with no evidence from prospective clinical trials.
- **TITAN: SvS (Treatment in Thoracic Aortic aNeurysm: Surgery versus Surveillance)** - multi-center clinical study for patients with **ascending aortic aneurysms between 5.0-5.4 cm** with aim to :
  - A. **Randomize patients:** initial surgery vs. surveillance
  - B. **For patients not randomized:**
    - I. **Operative registry:** surgery as initial treatment
    - II. **Surveillance registry:** surveillance as the initial strategy.
- In this report, **we compare patient characteristics for enrolled subjects in the randomized and the registry arms** of the study to understand factors behind patient selection, which may affect the applicability of results



## *Methods*

- Demographic characteristics of 615 patients prospectively enrolled at 22 sites into the TITAN study (9/2018 – 12/2023) were analyzed and compared between the:
  - **Randomized arm, n=210**
  - **Operative registry, n=147**
  - **Surveillance registry, n= 258**
- **Preoperative characteristics, aortic size, indexed aortic parameters and country wise and site wise distribution of patients were compared**
- Categorical variables reported as counts and percentages and compared with chi-square test or Fischer's exact test.
- Continuous variables reported as mean  $\pm$  standard deviation compared with one-way ANOVA or Wilcoxon rank-sum test where appropriate. Percentages are corrected for missing data.



# *Results*



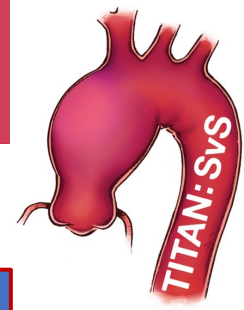


**Patient Characteristics**

➤ **Non-operative registry: most co-morbidities - older, more HTN, dyslipidemia, CAD, Afib, DM, CVA, pHTN, PVD**

➤ **Take away: Sicker patients more likely be offered surveillance**

Patient Characteristics	Randomized (N=210)	Registry (Operative; N=147)	Registry (Surveillance; N=258)	P-value (all 3 groups)	P-value (OpReg vs. SurvReg)
<b>Demographics</b>					
Female	48 (23%)	28 (23%)	39 (16%)	0.12	0.24
Age, years	64.2 ± 9.8	60.8 ± 12.7	70.3 ± 9.8	<0.01	<0.01
Weight, kg	93.2 ± 21.0	96.4 ± 29.0	95.3 ± 34.5	0.58	0.76
Height, cm	174.5 ± 16.5	175.6 ± 13.5	175.4 ± 13.0	0.71	0.91
BSA, m2	2.1 ± 0.3	2.1 ± 0.3	2.1 ± 0.3	0.53	0.63
<b>Past Medical History</b>					
Hypertension	140 (69%)	103 (71%)	199 (79%)	0.02	0.05
Dyslipidemia	101 (49%)	51 (35%)	133 (55%)	<0.01	<0.01
CAD	19 (9%)	18 (12%)	60 (24%)	<0.01	0.01
Prior PCI	8 (4%)	6 (4%)	22 (9%)	0.05	0.08
Congestive heart failure	2 (1%)	16 (11%)	20 (8%)	<0.01	0.32
Atrial fibrillation	21 (10%)	19 (13%)	61 (24%)	<0.01	0.01
Diabetes mellitus	31 (15%)	10 (7%)	39 (16%)	0.03	0.01
Chronic kidney disease	6 (3%)	6 (4%)	21 (8%)	0.03	0.10
COPD	12 (6%)	7 (5%)	23 (9%)	0.19	0.11
Pulmonary hypertension	0	6 (4%)	9 (4%)	0.02	0.79
CVA	15 (7%)	6 (4%)	25 (10%)	0.10	0.04
Carotid artery disease	1 (0.5%)	1 (0.7%)	11 (4%)	0.01	0.04
PVD	4 (2%)	0	14 (6%)	<0.01	<0.01
Smoking History	93 (46%)	57 (39%)	100 (40%)	0.39	0.80



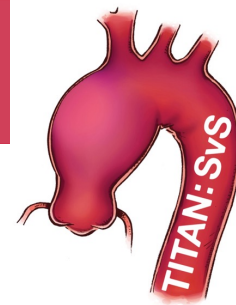
## No Difference in Maximal or indexed aortic diameters in the three groups

Aortic Parameter	Randomized (N=210)	Registry (Operative; N=147)	Registry (Surveillance; N=258)	P-value (all 3 groups)	P-value (OpReg vs. SurvReg)
Maximal ascending aortic diameter, cm	5.1 ± 0.3	5.0 ± 0.3	5.1 ± 0.5	0.10	0.20
Maximal aortic area, cm <sup>2</sup>	19.4 ± 4.0	19.0 ± 7.3	19.2 ± 6.4	0.91	0.76
ASI, cm/m <sup>2</sup>	2.5 ± 0.3	2.4 ± 0.4	2.5 ± 0.5	0.34	0.20
Asc Aortic length, cm	9.0 ± 1.6	8.7 ± 1.5	9.4 ± 1.5	<0.01	<0.01
Aortic length/BSA, cm/m <sup>2</sup>	4.4 ± 1.0	4.2 ± 1.0	4.5 ± 1.0	0.11	0.01
LHI, cm/m	5.2 ± 1.0	5.0 ± 1.1	5.3 ± 0.9	0.10	<0.01
AHI, cm/m	3.0 ± 0.4	2.9 ± 0.5	2.9 ± 0.4	0.41	0.37
max ao area/height, cm <sup>2</sup> /m	11.2 ± 2.4	10.8 ± 3.9	11.0 ± 4.4	0.70	0.77

BSA = body surface area, LHI: aortic length to height index, ASI: aortic size index, AHI: Aortic height index

➤ **Takeaway: Size does not seem to be the differentiating criteria for selecting initial treatment strategy**

(In fact, the ascending aortic length and indexed aortic length was the LOWEST in the operative registry group)



# Patients meeting secondary criteria for intervention based on 2022 AHA/ACC Aortic Guidelines

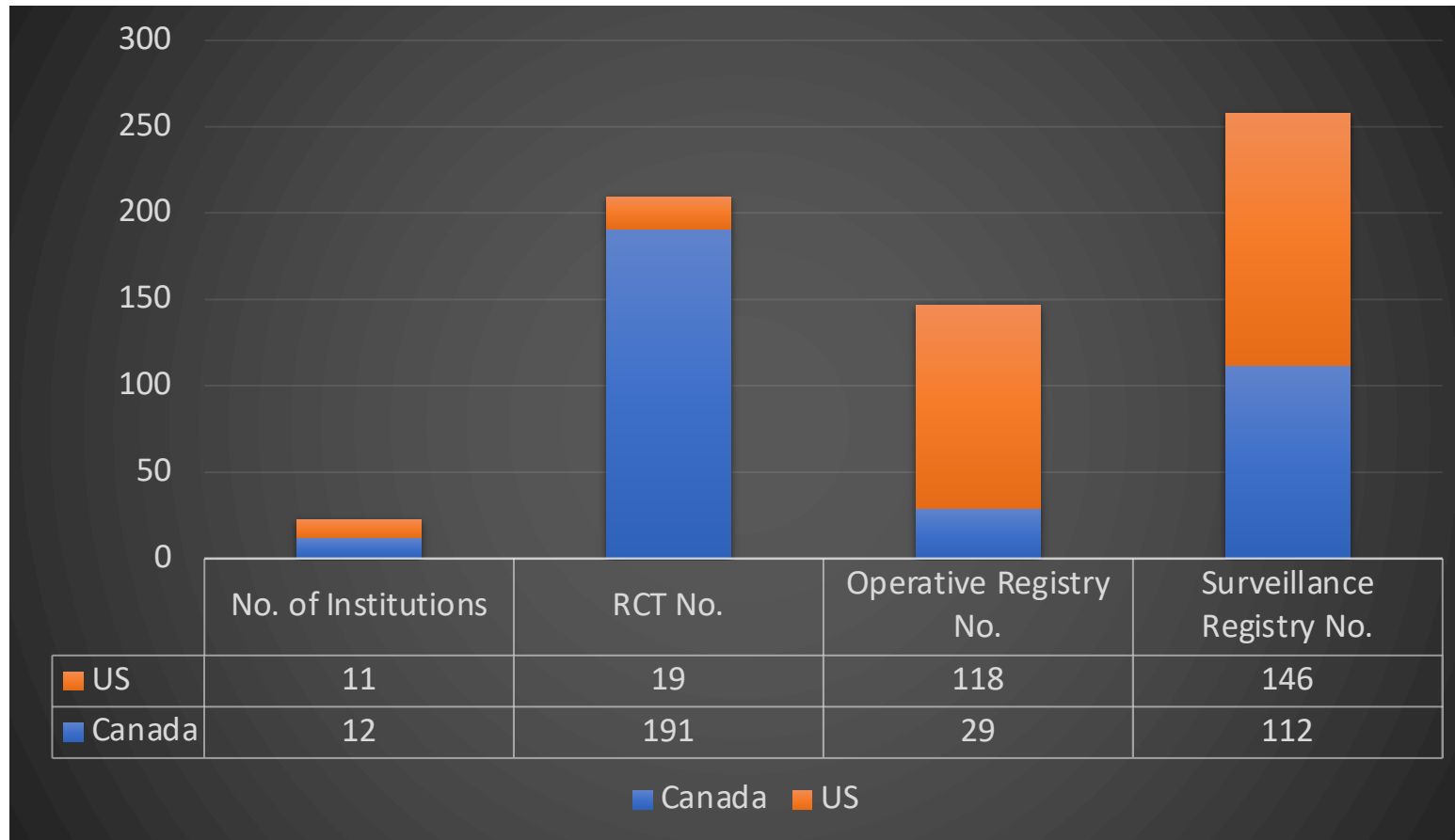
	Randomized (N=210)	Registry (Operative; N=147)	Registry (Surveillance; N=258)	P-value (all 3 groups)	P-value (OpReg vs. SurvReg)
ASI $\geq$ 3.08 cm/m <sup>2</sup>	8 (6%)	6 (5%)	14 (8%)	0.75	0.47
AHI $\geq$ 3.21 cm/m	20 (15%)	9 (8%)	21 (11%)	0.19	0.35
IAA $\geq$ 10 cm <sup>2</sup> /m	99 (80%)	59 (70%)	94 (68%)	0.07	0.94
Any of the three criteria	102 (77%)	61 (55%)	104(56%)	<b>&lt;0.01</b>	0.85

ASI: aortic size index, AHI: Aortic height index, Indexed Aortic Area

- **No Significant difference in patients above the indexed aortic size, indexed aortic height or indexed aortic area thresholds for intervention suggested in the 2022 ACC/AHA aortic guidelines**
- **When considered together, number of patients meeting any of the three thresholds are different in the three groups; lowest in the operative registry**

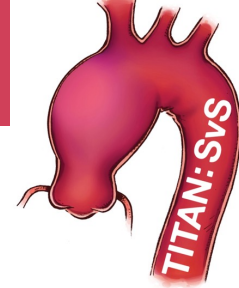


# Patient Enrollment Data: USA vs. Canada

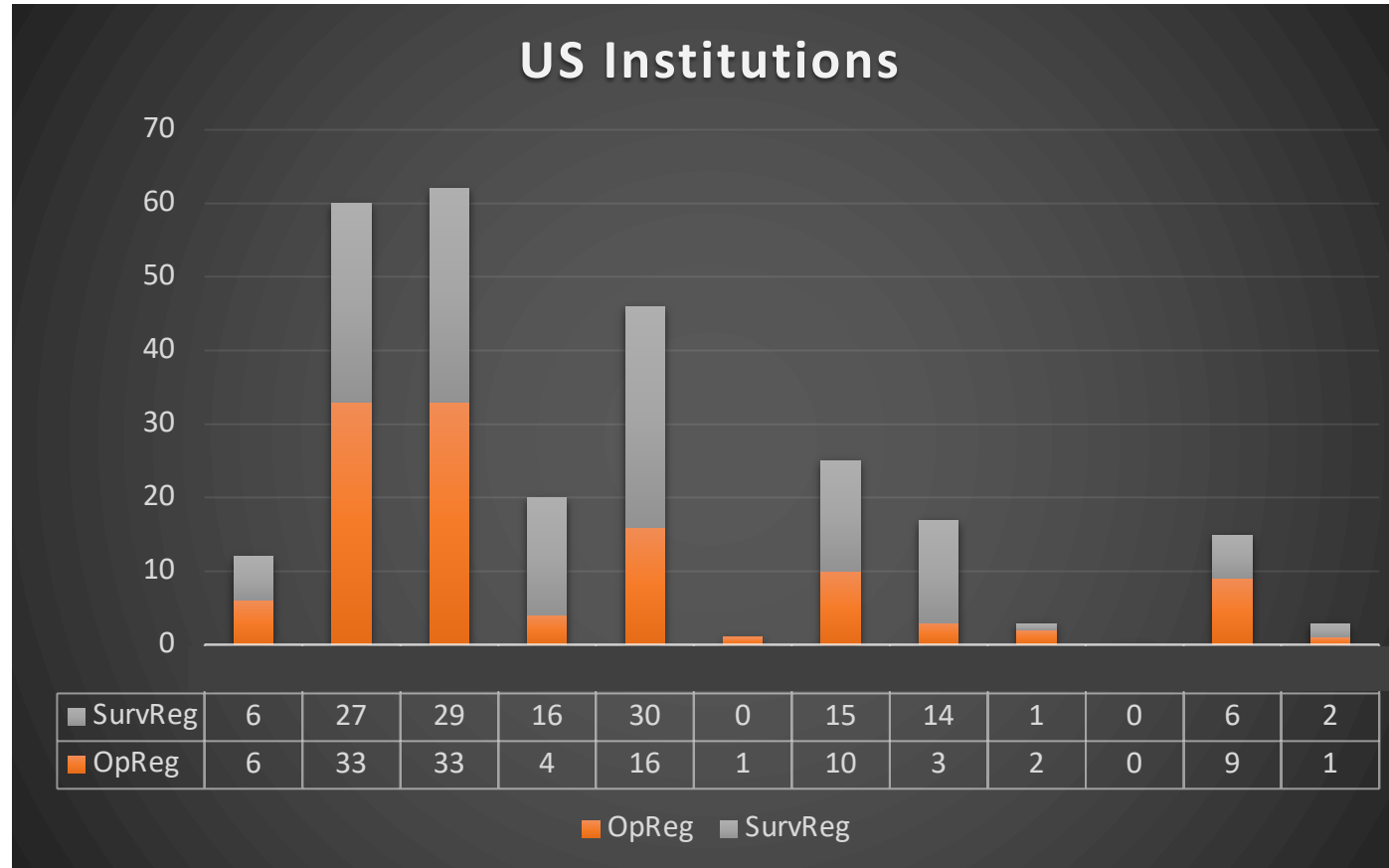


- Despite similar number of enrolling centers in the two countries, **91% of patients in the randomized arm were enrolled in Canada**
- **Canadian patients: 58% randomized, 9% operative registry, 34% surveillance registry**
- **US patients: 7% randomized, 42% operative registry, 51% surveillance registry**

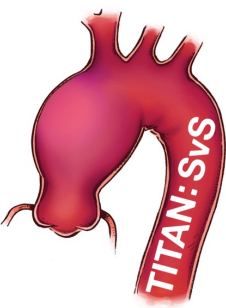




# Patient Enrollment: US Center Level Data

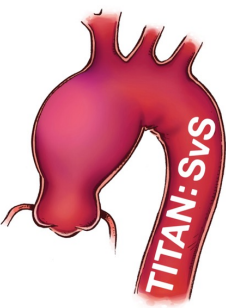


➤ There appears to be **center level equipoise** between operative and surveillance registry, with most centers enrolling 45-60% of registry patients into surveillance arm vs. the operative arm



## *Conclusions (I):*

- ❖ There are **significant differences in patient characteristics** between the randomized patients vs. patients in the two registry cohorts of the TITAN:SvS study:
  - Surveillance registry has the greatest number of older, sicker patients
  - **Implication: published outcomes of operative registries can not be universally applied to all patients, as sicker patients may have been excluded**
- ❖ **No significant difference in aortic size in the three groups**
  - Patients in the operative registry had the lowest aortic length and indexed aortic length, whereas it should have been the opposite if the size/length was the main stimulus to operate
  - **Implication: Patient characteristics, rather than aortic size, seem to be driving decision making regarding initial treatment strategy**



## *Conclusions (II):*

- ❖ There is a significant difference in the enrollment patterns between USA and Canada. **Despite center level equipoise between operative and the surveillance strategies, only few patients have been randomized in the USA**
  - **Reasons for this are likely multifactorial** and may include differences in patient preference, surgeon perspectives, referral patterns, insurance/healthcare system structure and medicolegal environment.
- ❖ Given the differences noted between the randomized and registry cohorts of the TITAN: SvS trial:
  - Outcomes from operative registries (especially US studies) should be interpreted carefully
  - Future trials may consider a strategy of having a parallel registry to an RCT to interpret RCT data alongside contemporary real-world insights



# Thank you!

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*Any questions?*



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