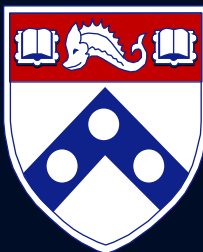


LINC 2021: Advanced concepts for TEVAR

# Durable Thoracic Outcome after 5 Year follow-up

Nimesh D. Desai MD PhD  
Co-Director, PENN Thoracic Aortic Program  
Hospital of the University of Pennsylvania



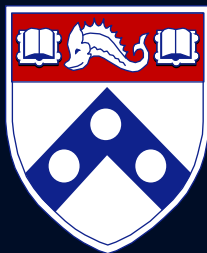
# Longer-term Outcomes of TEVAR



TEVAR Durability:

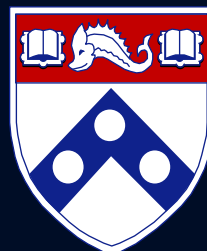
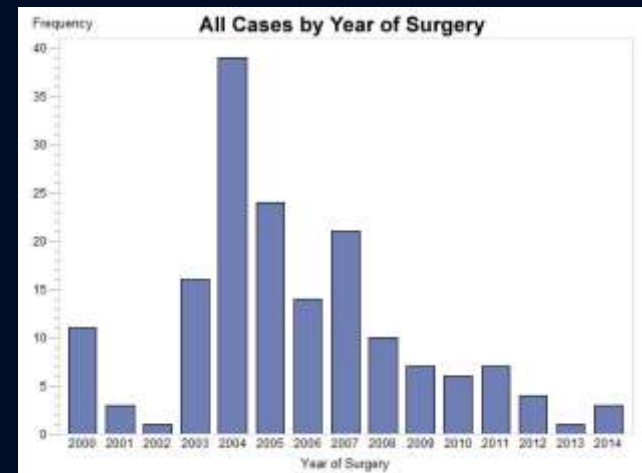
Pooled Results from  
FDA IDE studies

Desai et al AATS Aortic Symposium 2020



# Methods – ON-LABEL ANEURYSM ONLY

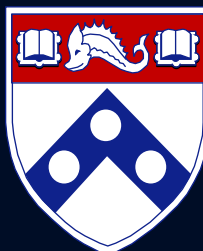
- Outcomes of 167 TEVAR patients from FDA IDE clinical trials of 6 TEVAR devices (2000-2015):
  - Gore TAG: 72
  - Gore CTAG: 7
  - Cook TX2: 27
  - Medtronic Talent: 37
  - Medtronic Valiant: 19
  - Bolton Relay: 5
- 14 trials in total
- High Quality Adjudicated data with imaging(5yr)
- Clinic, telephone, CT follow-up (~90% at least 3 yrs, 76% at least 5 yrs)
- Standard univariate, regression, survival analyses



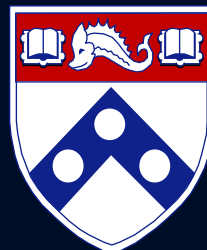
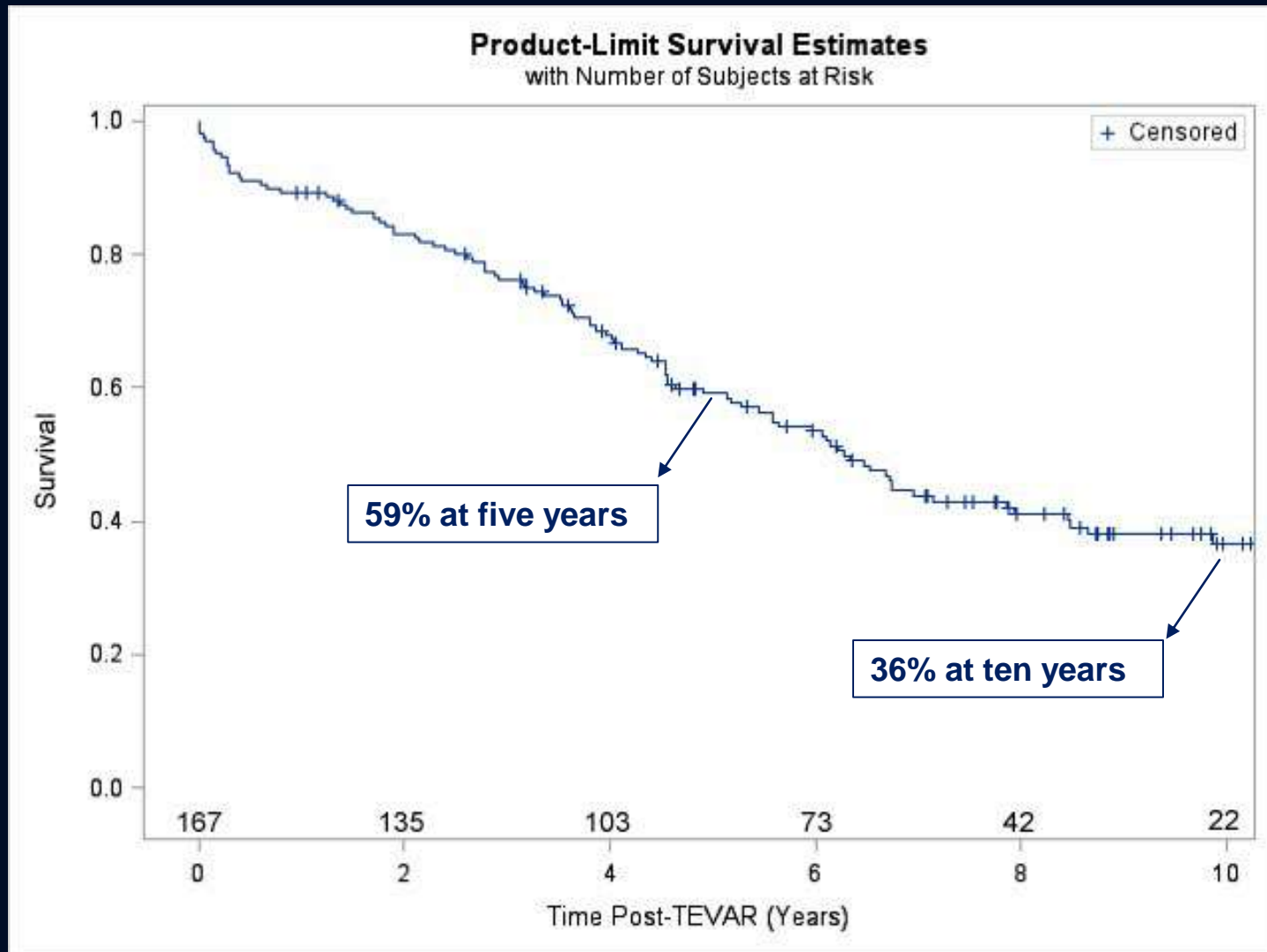
# Results – Demographics and perioperative outcomes

Demographics	TEVAR (n=167)
Age (yrs)	<b>74.0 +/-6.1</b>
Female	65 (39)
Smoking	104 (65)
<b>COPD</b>	<b>59 (38)</b>
Prior CVA	16 (10)
Hypertension	148 (91)
Prior MI	28 (19)
Diabetes	30 (19)
Renal failure	11 (7)
Urgent/emergent presentation	19 (12)

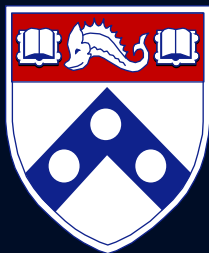
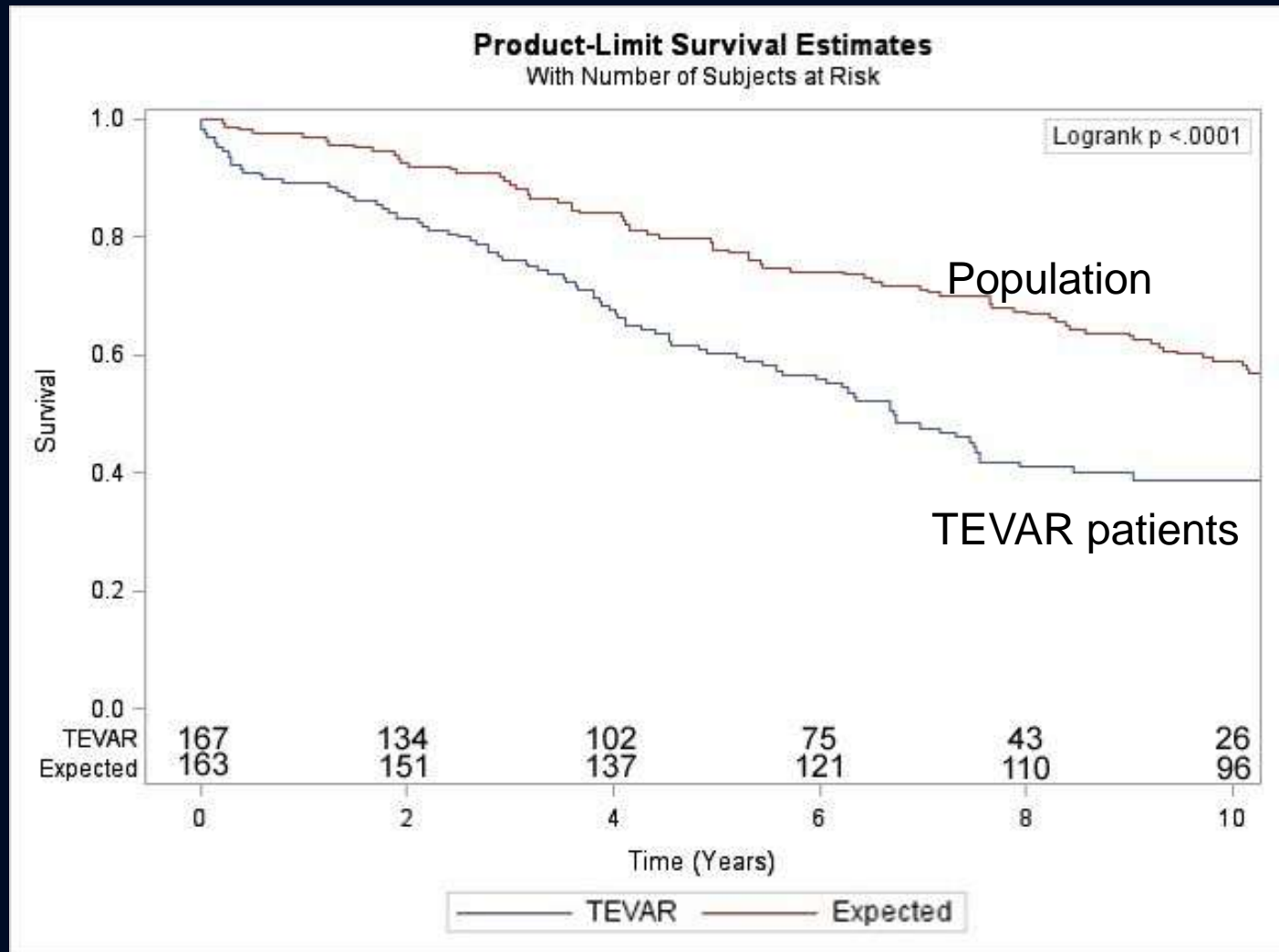
Periop Outcomes	TEVAR (n=167)
Thirty-day mortality	5 (3%)
In-hospital mortality	4 (2%)
Paralysis/paraparesis	4 (3%)
Permanent paralysis	3 (2%)
Stroke/transient ischemic attack	5 (3%)
Permanent stroke	7 (4%)
<b>Composite (permanent stroke, permanent paralysis, death)</b>	<b>10 (6%)</b>



# Results – 10 year Survival



# Results – Survival: TEVAR vs Expected

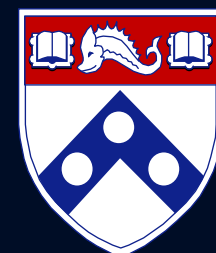


# Results – LATE MORTALITY

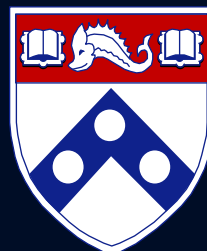
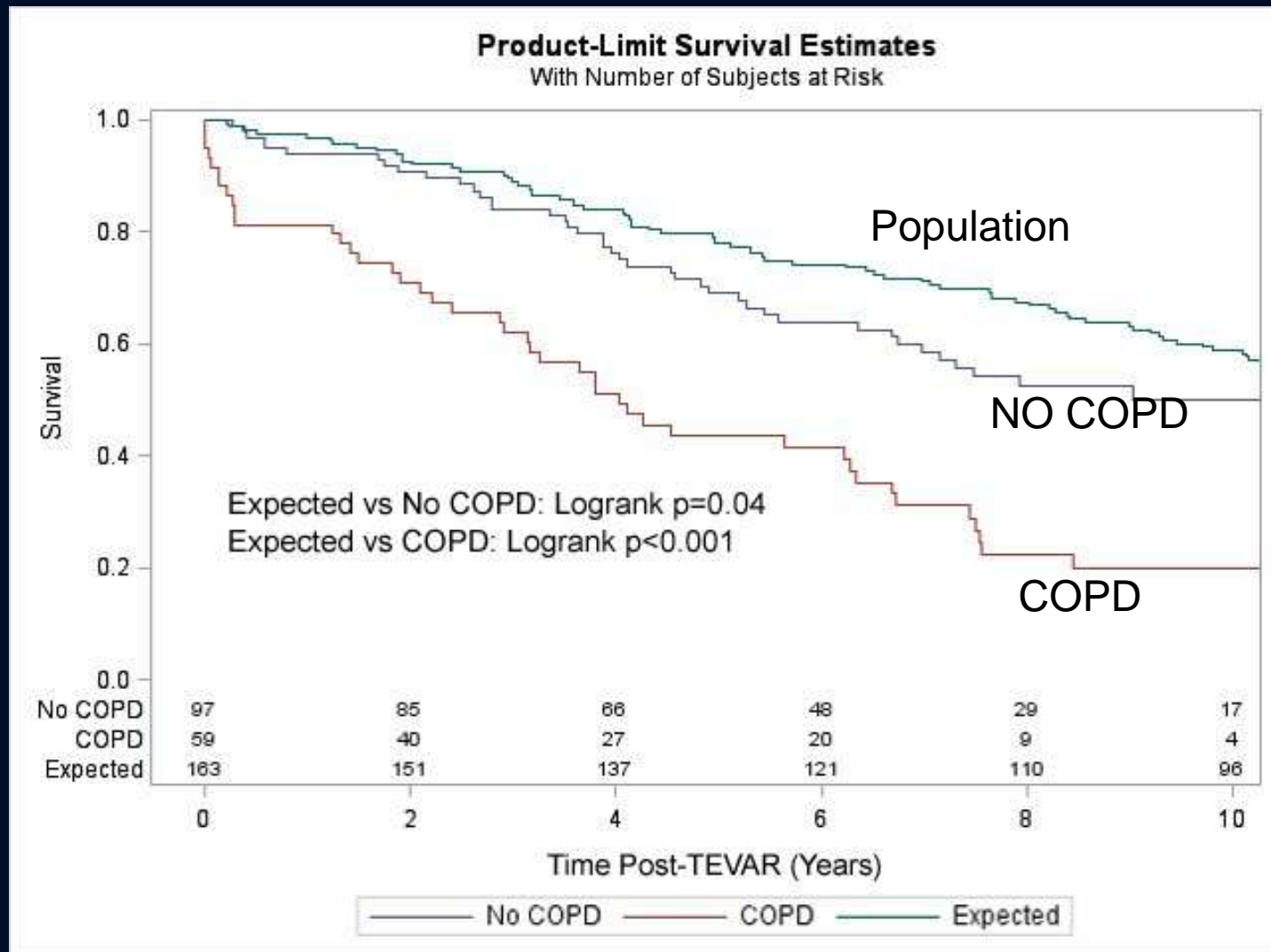
Cox survival model

Variable	Hazard Ratio	95% CI	p Value
<b>Age</b>	<b>1.1</b>	<b>(1.0, 1.1)</b>	<b>&lt;0.001</b>
<b>Female</b>	<b>1.7</b>	<b>(1.0, 3.0)</b>	<b>0.05</b>
Hypertension	1.2	(0.5, 2.9)	0.63
Diabetes	1.0	(0.5, 2.0)	0.94
<b>COPD</b>	<b>2.7</b>	<b>(1.4, 5.0)</b>	<b>0.003</b>
CVD	0.6	(0.3, 1.2)	0.14
Renal failure	1.3	(0.4, 3.7)	0.65
<b>PAD</b>	<b>1.8</b>	<b>(1.0, 3.3)</b>	<b>0.06</b>
Aortic size at time of implant	1.01	(0.98, 1.04)	0.46
<b>Failure of sac regression at 1 year (seen in 24% of pts)</b>	<b>2.0</b>	<b>(1.1, 3.6)</b>	<b>0.03</b>

- No Graft specific differences
- No impact of endoleak accounting for sac regression

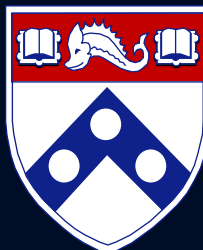
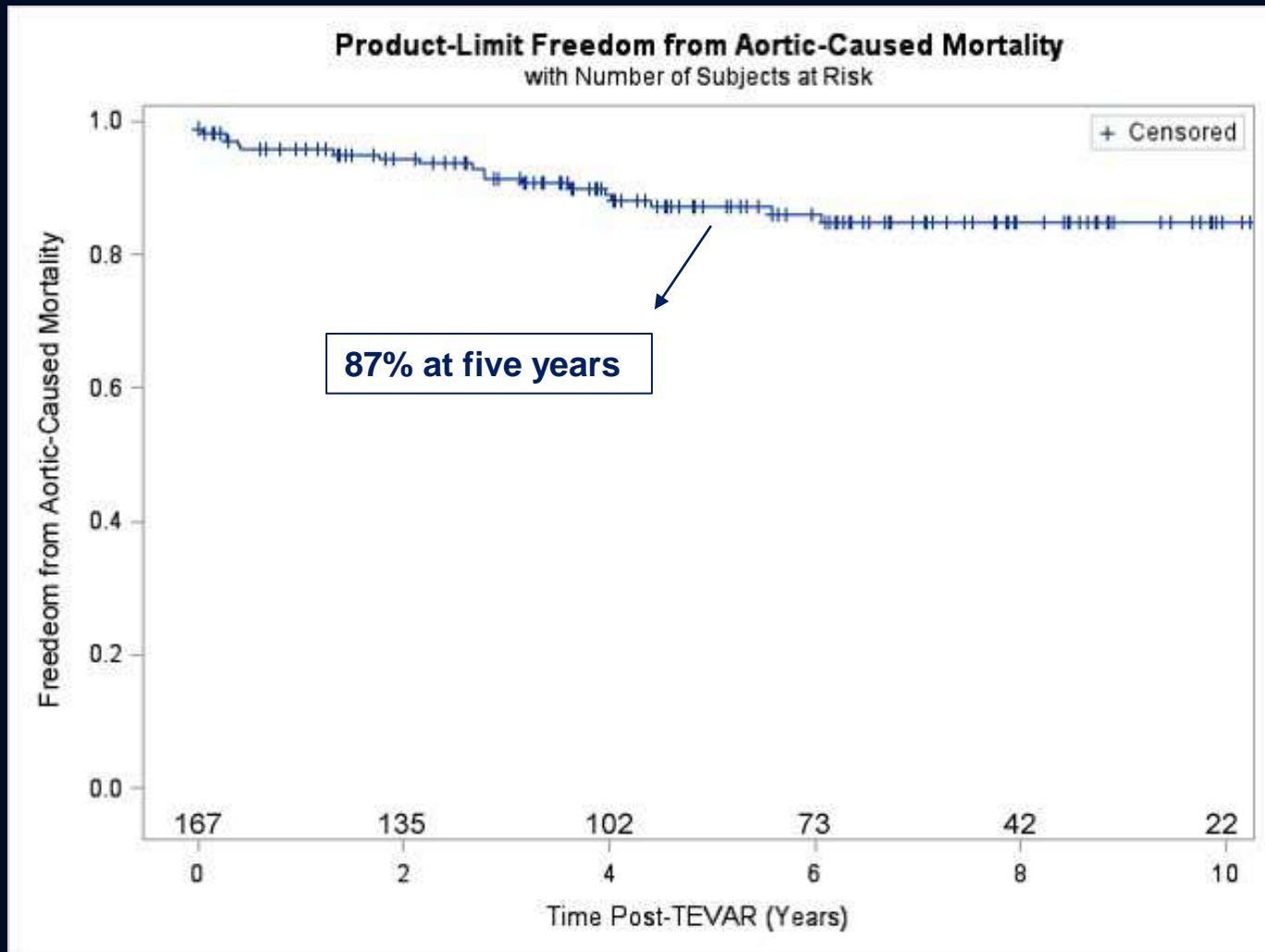


# Results — Survival by COPD vs Expected Curve

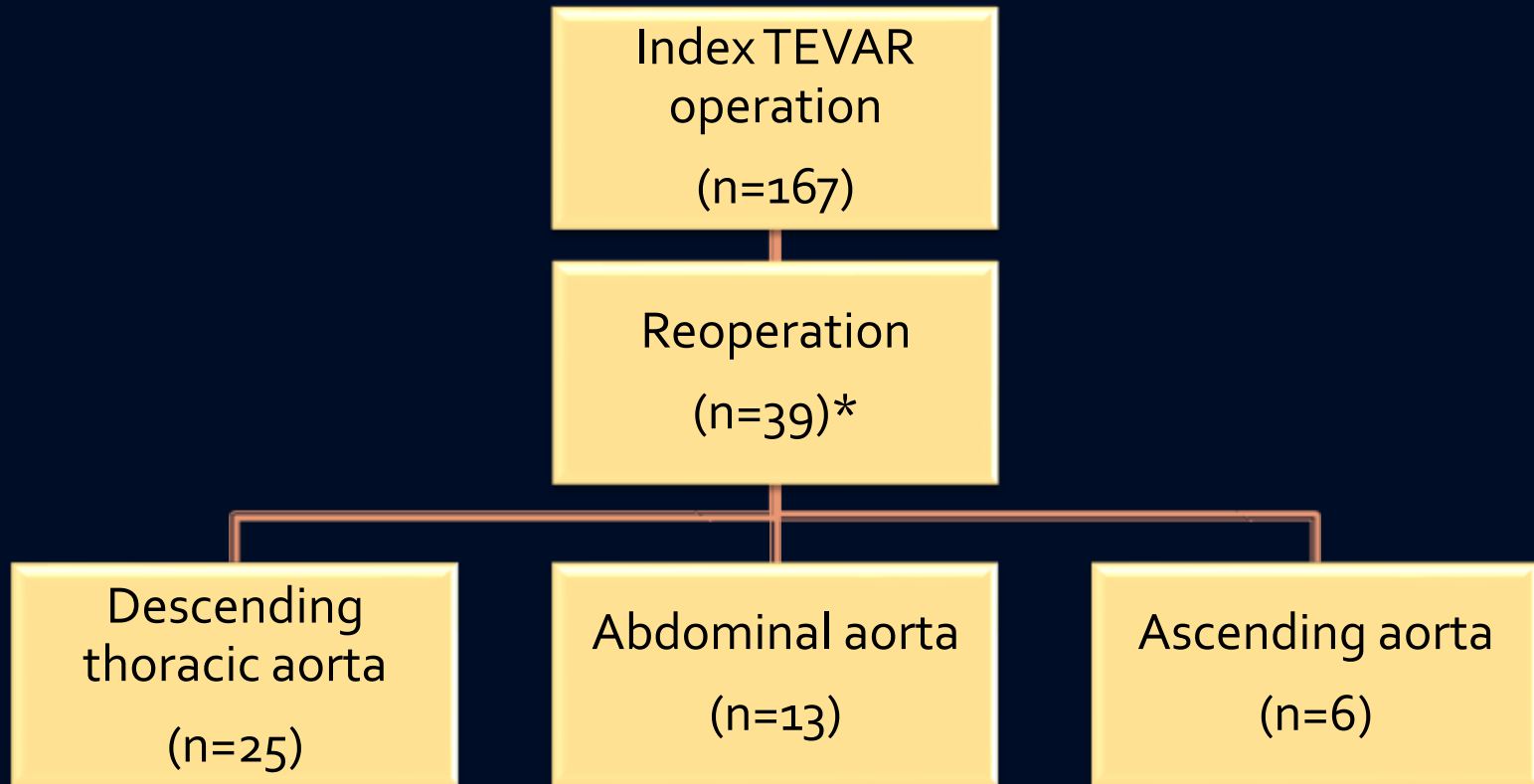




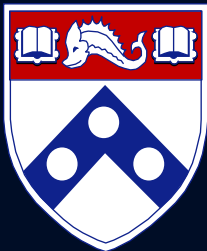
# Results – Freedom from aortic-mortality



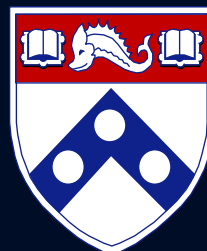
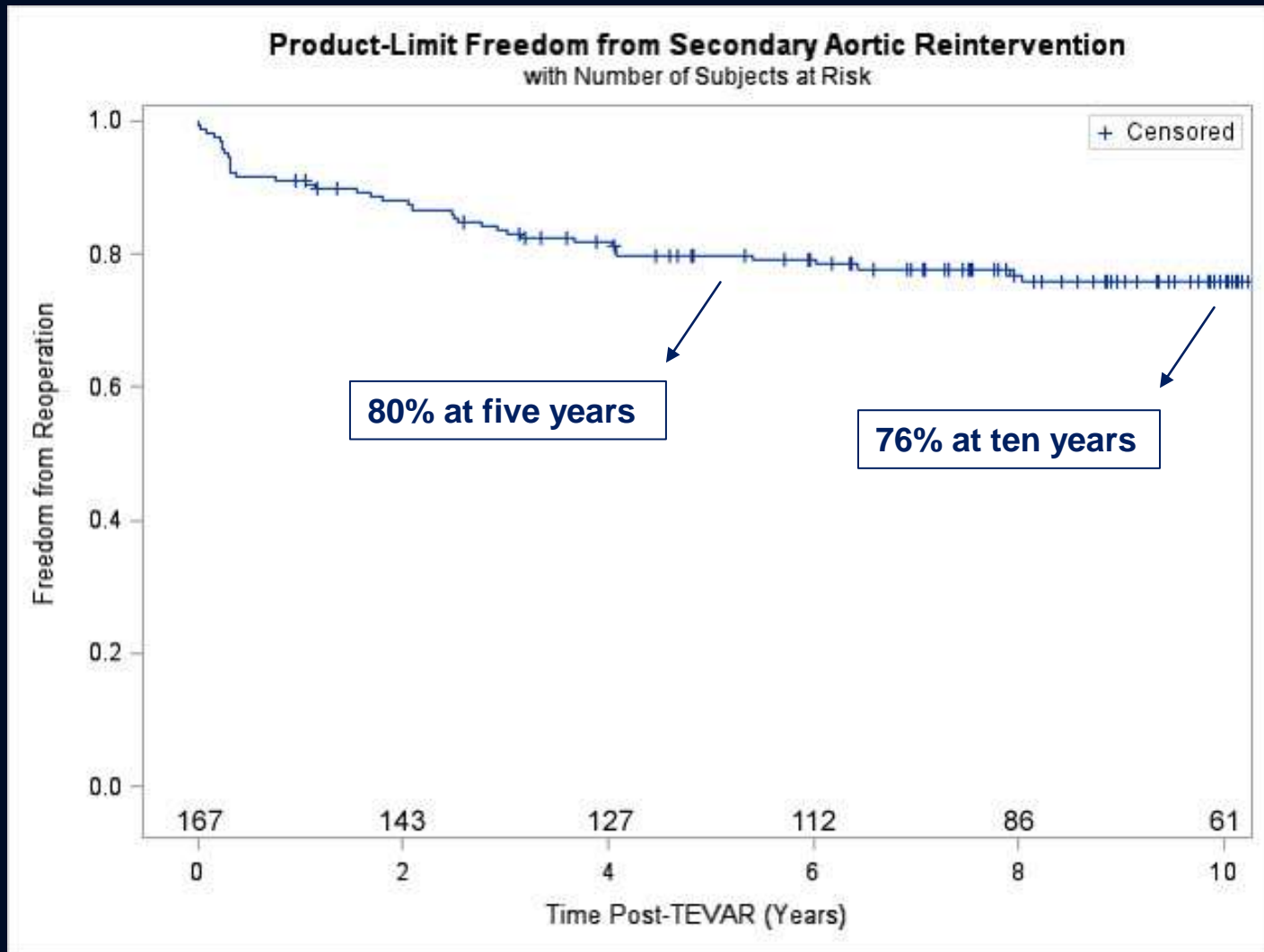
# Results – Reintervention



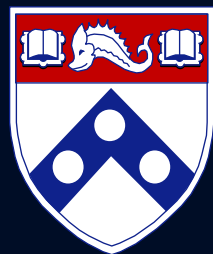
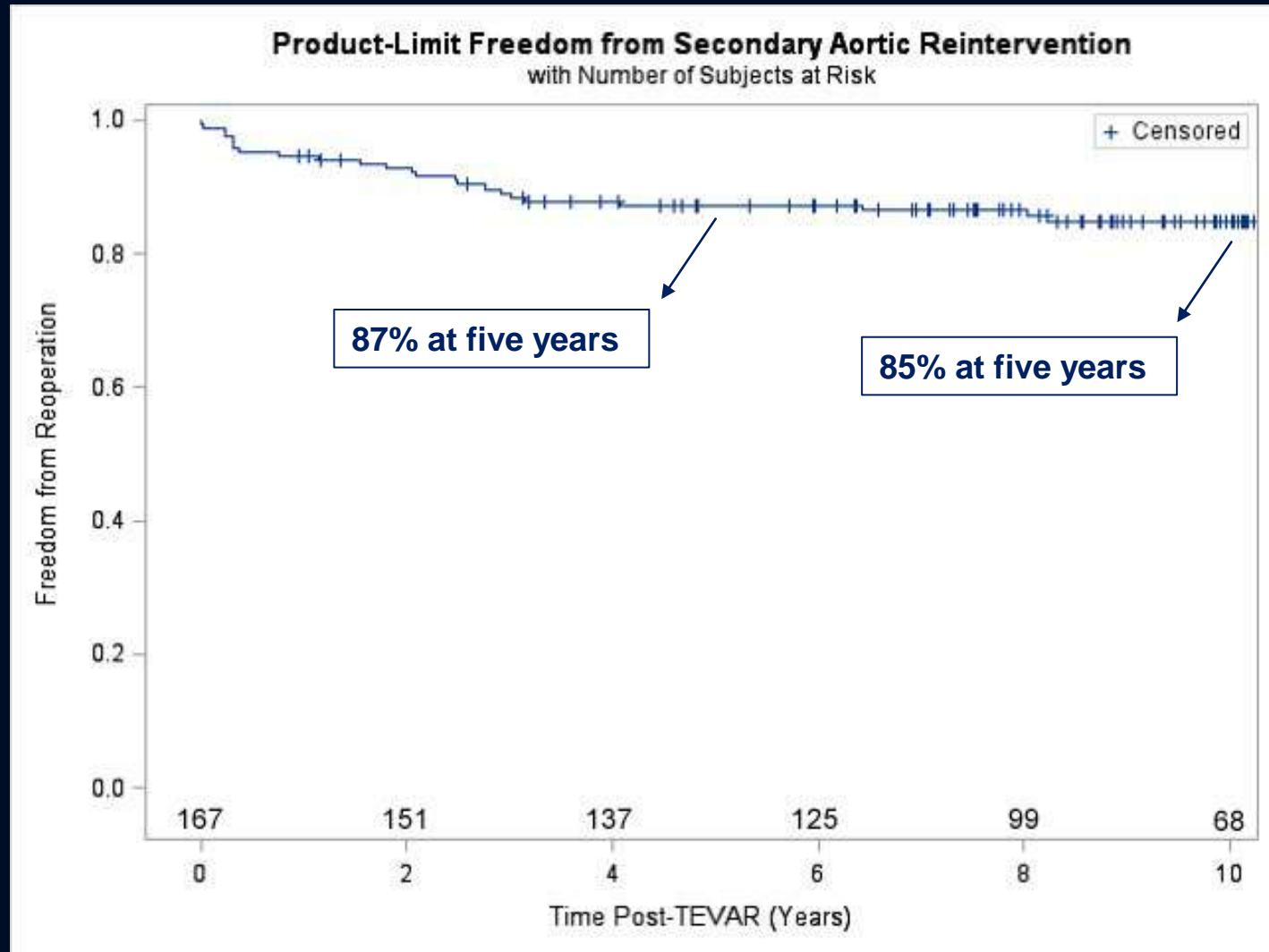
\*Some cases classified as more than one category



# Results – Freedom from *any* secondary aortic reintervention

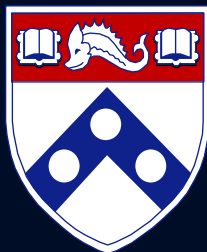


# Results – Freedom from secondary aortic reintervention (*descending thoracic*)



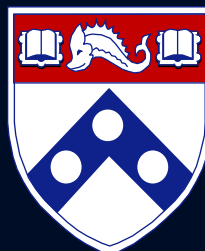
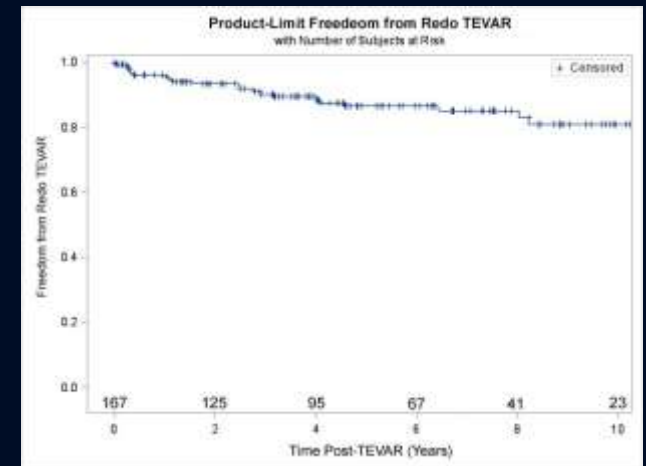
# *Results* — Descending Thoracic Reinterventions

- **Total (n=25)**
  - 2 open repairs
  - 1 endovascular repair of type 1 endoleak with open reintervention one year later
  - 21 redo TEVARs for endoleak (incl 2 redo redos)
  - 1 redo TEVAR for intramural hematoma at level of stent and PAU in arch

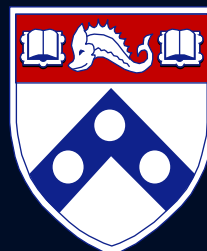
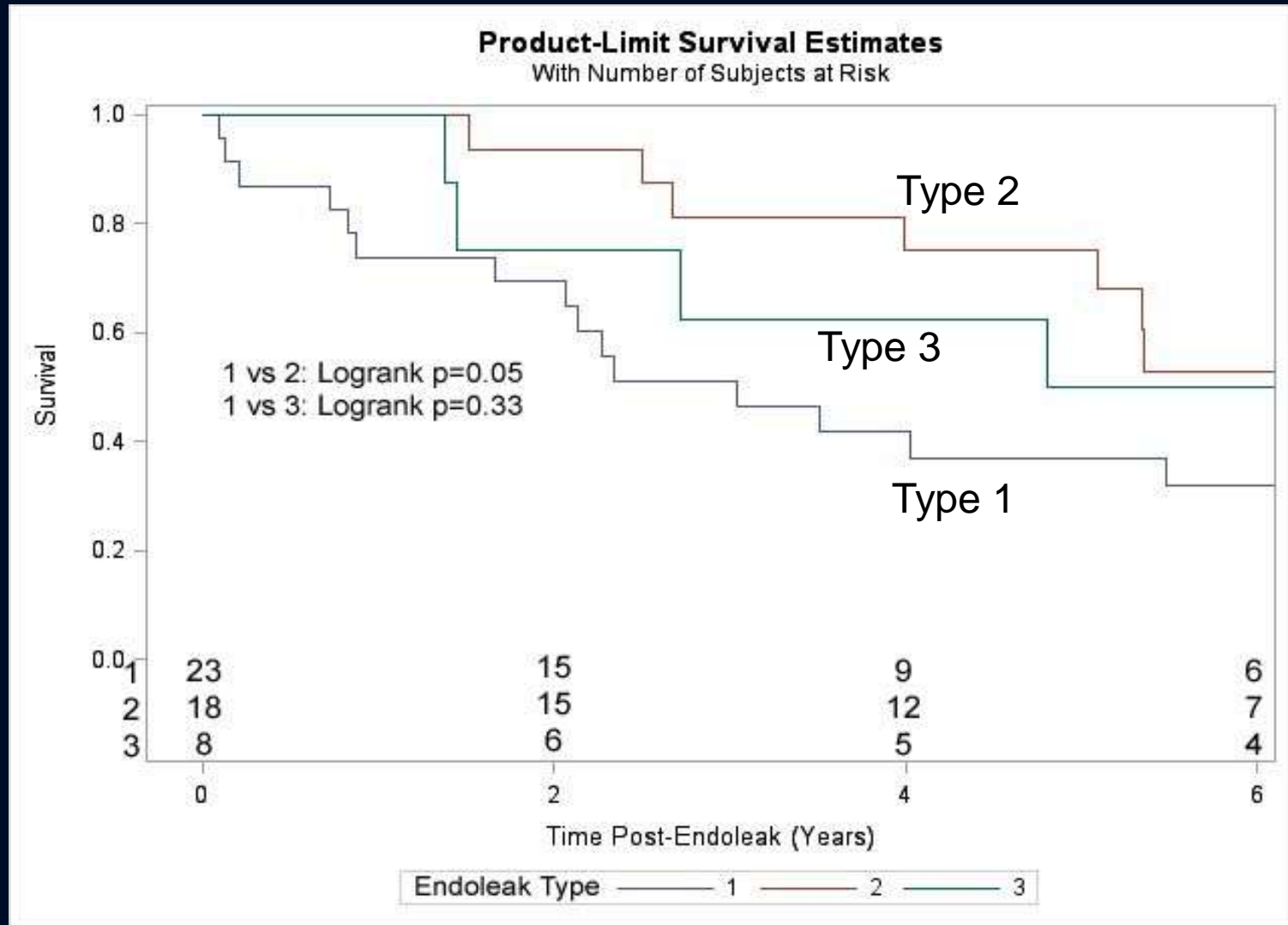


# Results – Redo TEVAR

Variable	TEVAR (n=167)
Total	22 (13%) + 2 Redo Redo's
Redo Extensions	
Proximal Extension	8 (5%)
Distal Extension	9 (5%)
Both Distal and Proximal Extensions	4 (2%)
No Extension	2 (1%)
Indication	
Type I endoleak	14 (8%)
Type II endoleak	2 (1%)
Type III endoleak	4 (2%)



# Results – Survival by endoleak type (endoleak onset to death)



# Conclusions

- TEVAR is a safe and effective treatment for thoracic aortic aneurysms
- *COPD* is highly associated with poorer late outcome
- Failure of *Aneurysm to shrink* at 1 year is associated with late death
- Aortic Reintervention Events *frequently occur in the non-treated aorta* and patients need close long-term follow-up

